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# PRINCIPLES OF THE PRACTICE OF ARCHITECTURE

AFTER the signing of the Armistice on November 11, 1918, THE AMERICAN ARCHITECT, reviewing the state of architectural practice in this country during the War and forecasting the conditions that would confront architects in their part in any scheme involving re-construction, printed in its issue of November 27, 1918, a Creed of the Principles of the Practice of Architecture.

This creed was as follows:—

1. The business of architecture is inseparable from the profession of architecture. Together they comprehend the originating, promoting, designing, planning, directing and controlling the construction of buildings and their appurtenances.

2. To develop a general demand for architectural service—without which only limited opportunities for practice will be presented—the architect must, as an individual and collectively, employ proper and effective means to create a universal appreciation of its intrinsic value.

3. To fully perform his function, the architect must organize, equip and operate his business so as to render complete service in the production of plans and specifications for everything embraced in the construction, equipment and furnishing of buildings.

4. He must furnish complete and detailed supervision of construction and be closely identified with it. He must be responsible financially, as well as morally, for all of his acts, including the correctness of design, the completeness and accuracy of plans, specifications and details, and the construction of the building in accordance therewith; his responsibility to be contingent only on his being accorded freedom in deciding all matters of structural design, mechanical equipment and the selection of materials and workmen.

5. He must control and regulate the business affairs of the building operation so as to safeguard all interests. He must be just and impartial in deciding all controversies within his jurisdiction, but where his own interests are involved he must submit the controversy to arbitration.

A lapse of more than three years has occurred, and in view of the epoch-marking things that have taken place, it would seem to be more than ever true that the careful observation of these principles in architectural practice is necessary to the rehabilitation of the profession in all its former dignity.

VI CENTURY SARCOPHAGUS, RAVENNA, ITALY

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, JANUARY 4, 1922 NUMBER 2384

# THE 1922 BUILDING OUTLOOK

FROM time immemorial, the leaders in trade, commerce, finance and industry have devoted their energies and money without measure to attempts at foretelling future conditions in their various fields and deducing the probable consequences. Their actions constitute conscious or unconscious recognition of the truth of the proverb "He who does not look before him, must take misfortunes for his earnings." The Chinese even went further than to warn of disaster in the event of failure to look ahead. They pointed out alluring possibilities of wealth that might attend the possessor of prophetic vision. Their saying has it "He who could see only three days into futurity, might enrich himself forever." In any event, the importance of being forewarned of impending situations needs no defensive argument, and with the purpose of ascertaining the actual conditions obtaining in the construction field, THE AMERICAN ARCHITECT has recently conducted an investigation among architects, manufacturers of building materials and equipment, and money loaning institutions.

In order to secure as accurate an estimate as possible of the amount of work on the boards in architects' offices and the opinions of architects concerning pertinent questions in this connection, the following questionnaire was sent to every sixth architect or architectural office on THE AMERICAN ARCHITECT's subscription list without reference to location, prominence or any other consideration:

1. Do you believe the present cost of building will be materially reduced in your locality during 1922?
2. What is the approximate amount in dollars of the work which you have on your boards or in prospect?
3. What are the chief obstacles to this work going ahead promptly,—lack of money,—labor conditions,—or belief on part of owners that costs are coming down in the near future?
4. Is there any scarcity of labor in your locality?
5. Is there any scarcity of materials in your locality?
6. What is the attitude of loaning institutions towards building loans?

| Section from which replies were received | QUERY No. 1 Replies received in percentages | | | QUERY No. 2 | QUERY No. 3 Percentage ascribing difficulties in some degree to following causes | | | QUERY No. 4 Percentage of replies | | QUERY No. 5 Percentage of replies | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Yes | No | Non-committal | Average work per office replying | Lack of money | Labor Conditions | Owners believe prices will drop | Yes | No | Yes | No |
| New England States .... | 26.2 | 62.8 | 11.0 | 970,000. | 52.2 | 45.4 | 84.0 | 4.5 | 93.1 | 0.66 | 98. |
| North Atlantic States ... | 9.8 | 81.7 | 8.5 | 958,000. | 60.5 | 53.5 | 80.2 | 11.2 | 84.5 | 0.66 | 98. |
| South Eastern States ... | 20.0 | 80.0 | 0. | 963,000. | 70.0 | 10.0 | 30.0 | 0. | 100. | 0. | 100. |
| South Western States ... | 0. | 100. | 0. | 405,000. | 50.0 | 50.0 | 72.7 | 4.7 | 95.2 | 0.33 | 99.0 |
| Middle States .......... | 16.6 | 76.4 | 7.0 | 1,796,000. | 61.6 | 42.4 | 77.7 | 2.1 | 97.8 | 1.0 | 98.5 |
| Western States .......... | 10.2 | 89.8 | 0. | 705,000. | 46.1 | 33.3 | 69.2 | 25.6 | 74.3 | 2.0 | 97.5 |
| Total Average .......... | 15.0 | 79.0 | 6.0 | 1,170,000. | 57.1 | 43.8 | 76.1 | 6.0 | 92.5 | 3.0 | 96.0 |

Between 700 and 800 inquiries were sent out and approximately 300 replies were received. These have been tabulated, with the results as shown on the above table.

More than a casual glance at this table is necessary to comprehend fully the significance of the story which it tells. For example, sentiment in

New England regarding question No. 1 differs widely from that in the Southwestern states, where the opinion of those architects replying to the questionnaire was unanimous that there would be no material reduction in the cost of building during 1922. Probably the average of the entire country gives as accurate information on this question as can be had at this time. With 79 per cent. of the architects believing there will be no material reduction in the cost of building, there is little encouragement for a client who favors postponing his building operation for another year.

The answers to query No. 2 are surprising to those people who have maintained that there was little or no activity in architects' offices. From the table it appears that work in the Southwestern states is starting more slowly than in any other section and that the middle states are leading. The average per office of $1,170,000.00 worth of work, if maintained throughout the country, would give approximately $6,000,000,000.00 worth of work now on architects' boards. Undoubtedly some of this work will not go ahead during 1922, but on the other hand, there are millions, perhaps billions, of dollars' worth of work, not now contemplated, which will develop during the next year.

The answers to query No. 3 seem to indicate that the greatest obstacle to work going ahead promptly is the belief on the part of owners that prices will drop in the near future. There is only one section of the country where this is not true and that is the Southwestern states, where the greatest difficulty seems to be a lack of money. In general, labor conditions do not seem to offer the barrier that they did a year ago, and yet the letters received seem to indicate that in some of the principal cities reductions in wages must be effected before labor conditions will be conducive to the carrying out of the large building programs contemplated.

The replies to question No. 4 seem definitely to establish the fact that there is no labor shortage at the present time.

The same can be said in regard to question No. 5. Building materials and equipment are now available in any quantities demanded.

The answers to question No. 6 are so varied that it was not feasible to tabulate them. They range all the way from the statement that "There ain't no such animal as a building loan" to the architect who reports the loaning institutions very liberal and no difficulty whatever in securing money for any legitimate project. However, in something like 80 per cent. of the letters received dissatisfaction with the conditions in the loaning market was expressed.

To sum up the impressions gained from a careful perusal of the replies to this questionnaire, it would seem that, from the architects' viewpoint, scarcity of money and difficulties in securing it, taken together with the widespread impression on the part of owners that building costs are probably going to drop in the near future, constitute the principal obstacles to the resumption of building on an unprecedented scale.

In order to ascertain whether there was any basis for the owners' belief in the reduction of costs, a questionnaire asking the following information was sent to approximately 600 principal manufacturers of building materials and equipment. Replies were received from 45 per cent. of those addressed, with the following results:

1. Do you believe the cost of your product will be materially reduced during 1922?

Less than 10 per cent. replied in the affirmative.

2. Is there a prospect of labor cost coming down in the near future?

Fourteen per cent. replied in the affirmative; 80 per cent. in the negative and 6 per cent. were non-committal.

3. Have you capacity for greater output? In other words, are you running at full capacity now?

Twelve per cent. of those replying are now running at capacity, the balance all the way down to 25 per cent. The average is probably around 50 per cent.

4. Have you any trouble in securing shipping facilities?

The answer to this question is one that is particularly gratifying, in view of the difficulties experienced a few years ago. Only two manufacturers reported any difficulty, a percentage of less than 1 per cent.

5. Are there any obstacles to your making prompt shipment of any order received?

Only 4 per cent. of those replying answered in the affirmative, which seems to indicate a particularly favorable condition for increased building activity.

Our investigation of the conditions among loaning institutions was the most unsatisfactory and inconclusive of any which we have undertaken. Less than 25 per cent. of the institutions addressed made reply to the following letter:

Dear Sirs:

In canvassing the situation in the building field in an effort to determine just why needed building is not going forward more rapidly, we have been informed many times that there are two main obstacles in the way of a building boom.

First —The belief on the part of owners that building costs are coming down.

Second—The difficulty in securing building loans, and permanent mortgages.

In our issue of January 4th, we propose to discuss these questions, and are at present conducting an investigation to determine the true state of affairs concerning these two points.

If you are in sympathy with our efforts to present the facts, will you please write us, stating the attitude of your institution towards loaning money on buildings?

Are you prepared to make such loans?

If so, what percentage of present cost do you consider a full loan?

Is there plenty of money to loan on buildings in which the owner has invested a fair equity?

Thanking you for your co-operation, we are

Very truly yours,

Sixty per cent. of those replying evaded the questions or stated that their investment policy at the present time did not include building loans. The most frank statement received was one to the effect that so far as funds were available, loans were being made, not in excess of 50 per cent. of the institution's own valuation. The opinion was expressed by some that while money is not yet plentiful for this purpose, there were indications that it would be so within the next three or four months.

In considering the entire subject of building now it would seem that an architect might safely advise a client as follows:

First, that if he is not in position to finance his operation and must look for a loan from the generally recognized loaning institutions, the first move is to make sure of the money to carry on the project before any further expenses are incurred.

Second, if the financing can be taken care of or satisfactorily arranged, all other factors appear favorable. In fact to sum up the situation the concensus of opinion in the profession and among manufacturers of building materials and equipment is that there will be no material reduction in prices during 1922. There is no scarcity of labor. There is no scarcity of materials. Shipping facilities are ample. Further than that, the immense amount of work in prospect will in all probability change these conditions within the next few months. So it would seem to be the part of wisdom to go forward with work that can be financed as soon as possible. Indeed it is doubtful if building can be undertaken six months from now under anything like as favorable conditions as at the present time.

# THE BUILDING OUTLOOK IN THE MIDDLE WEST

By F. E. DAVIDSON, A. I. A.

ANY prediction of the building situation for the year of 1922 must obviously be based on conditions as they now exist and on conditions that may reasonably be expected to develop as the effect of economic laws which cannot be amended or repealed.

The first and most important factor is and will unquestionably be the volume of money and credits available for new construction. Funds for buildings will undoubtedly become available in direct proportion as the money now tied up in frozen credits is released and interest rates for building loans will be reduced in direct proportion as the Federal Reserve Bank lowers its rediscount rate.

The second factor to be considered is that of materials. The average level of the cost of building materials will probably only be lowered in proportion as the purchasing power of the dollar increases (subject to local fluctuations and the varying demand). It is obvious that the government will find it impossible to secure any material reduction in freight rates, and until freight rates are decreased it is probable that material costs will remain at approximately their present level.

The third important factor is that of labor. The building industry of America must realize that during the war a very large percentage of the skilled workers left the industry and are now employed elsewhere. It must also realize that there has been no appreciable accession to the ranks of skilled building mechanics by immigration; that the stagnation—so termed—in the industry for some years has to a very large extent disorganized and made inoperative the apprentice system in vogue in the large industrial centers, and that the officers of the labor unions in an effort to provide jobs for their members, have erected a barrier against those mechanics who would affiliate with them. Should anything like a building boom develop there are not enough building mechanics to do the work. Skilled building mechanics cannot be made over night and if, as some have predicted, the spring of 1922 will see a general revival of the building industry, the probabilities are that the competition for men and material will so act as to force the cost of construction to such levels that will in a short time effectively stop construction. Owners will not construct buildings if the cost is forced to such levels that they cannot secure a proper return on their investments.

It is probable that during 1922 there will be experienced much difficulty with organized labor. In many centers the building trades are thoroughly organized and will oppose to the utmost limit of the power of their organizations a reduction of wages in proportion to the increase of the purchasing power of the dollar.

Another important factor which has prevented any general resumption of building is that the building industry of the nation is in disrepute. The investigation by the Lockwood Commission in New York, the Dailey Commission in Chicago, the records of the investigations conducted by the Department of Justice, the hundreds of indictments returned by the Federal and State Grand Juries against labor officials, contractors and material firms, the story of the Arbitration Proceedings in San Francisco, Chicago, and other centers, the repudiation of written agreements and solemn pledges by both contractors' associations and trade unions, the almost universal disregard of the obligations of citizenship by owners who have insisted that their work shall be completed at any cost, even involving the payment of graft, the attitude of bankers and loan brokers, all have demonstrated the fact that the whole industry is permeated with rottenness in all its various branches. Apparently fair dealing cannot be expected and the time has arrived when a new start must be made in an effort to rehabilitate the industry, since the public apparently has no confidence in the fair dealing of either the trade unions, contractors' associations, material combines, or of any other factor of the building industry. Is it not possible that the coming year will witness a spiritual revival in the industry when its driving forces will be directed to a general house cleaning, realizing that no half-way measures can or will accomplish the desired result?

Is it not also possible that the public, realizing the utter futility of relying upon contractors' associations and trade unions to perfect agreements affecting the building industry and for which the industry must pay, will demand a general development and an adoption of the plan adopted by San Francisco to handle the labor problem? Is it not reasonable to assume that in direct ratio as the building industry in the various localities is rehabilitated in the confidence of the building public, will a general revival occur, limited only by the factors of available money, available materials and available labor?

# A MODERN CATHEDRAL FOR AN INDUSTRIAL CITY

BY ALFRED GRANGER, *Architect*

With a Foreword by the Right Reverend William Lawrence, Bishop of the Diocese of Massachusetts

## *Foreword*

*MY DEAR MR. GRANGER:—*

*I HAVE read your thesis and looked at the illustrations with much interest. I do not feel able to criticize the plans either in detail or in general, but am glad to jot down this memorandum.*

*In the first place, I think it is time that the Church of the twentieth century should give careful consideration to such changes of architecture and construction as will adapt the Christian Church both in the conditions of its worship and its work to the conditions of the present, and so far as we know the coming century. There is much in what you say in the preliminary part of your paper, and there is to my mind a distinct lack of original thought in matters of architecture and construction in the Church in this country.*

*Again, while a great Gothic cathedral may be in place in very few cities, I have my doubts as to whether it is in place in many of the cities in this country. While of course it is most appropriate for a few great services throughout the year, there is an enormous waste in connection with all the other services. Or to put it in another form, I am much afraid that our Church is being led into a great cost for bricks and mortar and beauty of architecture, all very well, which in time will mean a very heavy fixed charge on the Church for a comparatively inadequate return.*

*Again, in any cathedral construction the conditions of the American parishes must be considered. At present the strength of a diocese is in the parishes; and if a cathedral draws into the vortex of its influence and uplifting worship much of the spiritual constituency of the parishes, the diocese will grow weaker. Our aim in Boston at present has been to emphasize for down town Cathedral the week-day worship and the fact that it is a centre for the transients, the people living in boarding houses; and to discourage the regular family constituency which should go to make up the strength of the parish churches. And in connection with that should be, as you well suggest, the diocesan working centre. Unfortunately in Boston we have not the space where our Cathedral now is.*

*Whether such a plan as you suggest, wherein the working part of the institutional and working features of the Diocese have such a strong emphasis as compared with the cathedral itself would meet the sentiment of the American people I am not sure; but your studies are, it seems to me, in the right direction in bringing before the Church people of the country a fresh suggestion in regard to the architecture and construction of an American Cathedral.*

*I am with you, too, in feeling that where it is possible a cathedral should be in the very midst of the population. Think of St. Paul's Cathedral, London, if it were placed today in Belgravia or Knightsbridge.*

*It is pleasant to hear from a former Tech. student. I remain, with kind regards,*

*Yours sincerely,*

*WM. LAWRENCE,*

*Bishop, Diocese of Massachusetts.*

*November, 1921.*

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WHEN the great Gothic Cathedrals were built in the Middle Ages, they accurately expressed the life of their day. Aside from their architectural beauty, the quality which has made them the extreme expression of Art and has made them invaluable to succeeding ages is this quality of Truth, which is a fundamental quality of all living Architecture.

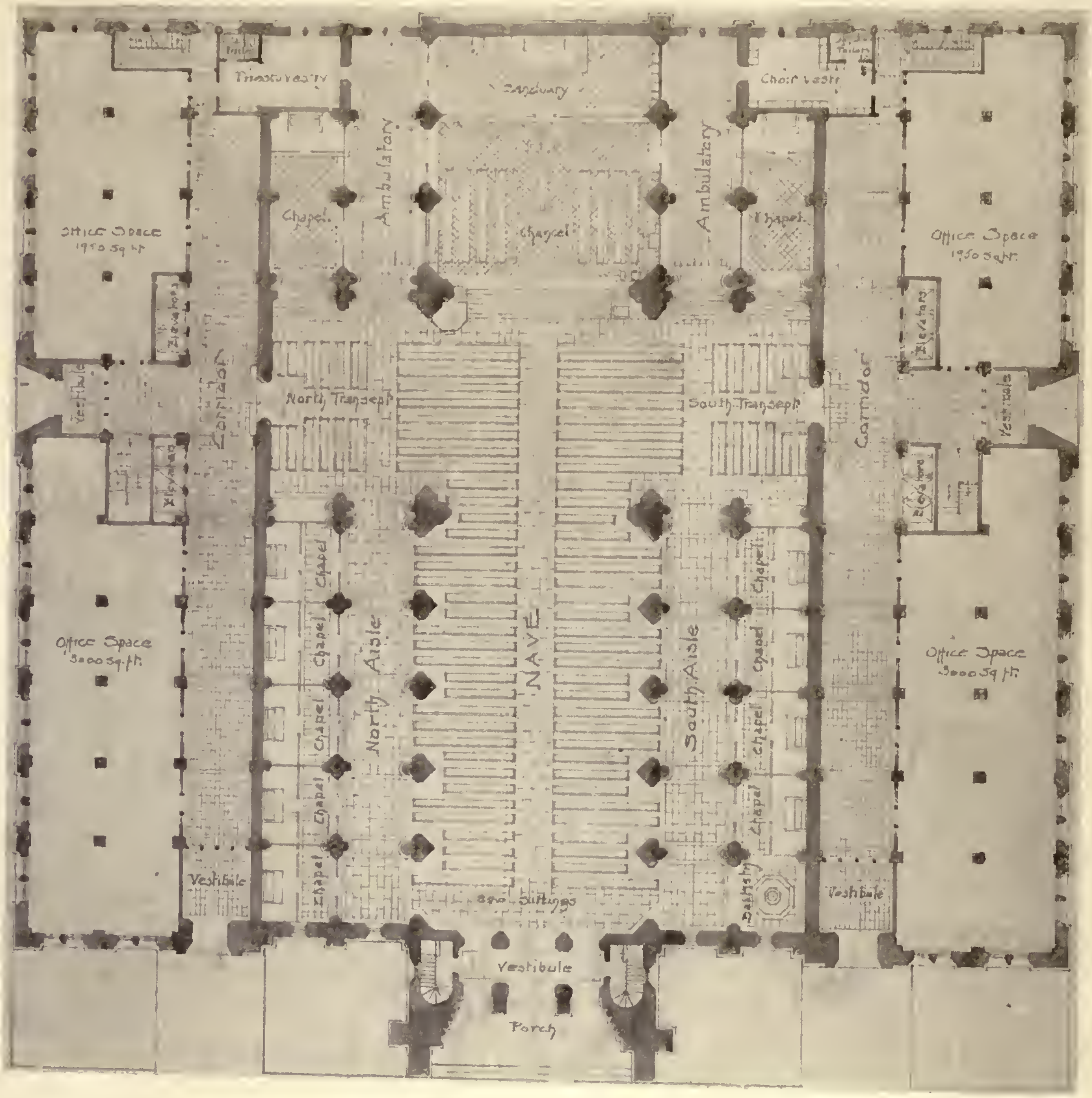
The ancient cathedrals tell the truth and enable us, for our day, to learn the manner of life of the days in which they were built.

In almost every case they are located in centre of the local population and around them grew up the religious and civic life of the community.

We are living in an age of intensive industry and commerce. This has been especially true of the United States since our Civil War, and each year the life of the community has gotten farther away from the churches which have been moved farther and ever farther from the business centres. When old Trinity Church, New York, was built its slender spire, with its Gothic foliation, dominated lower Manhattan Island; now it is completely lost among the towering structures of commerce which surround it.

W. L. George, in his recent book "Hail Columbia," praises enthusiastically American commercial architecture but speaks very slightingly of our Gothic churches, beautiful as they may be in themselves, because they are wholly out of touch with the life of our day which the Church should dominate, not only in its influence upon our lives, but also in its outward architectural expression.

Man, as has been frequently said, is incurably religious, and the minds of men, especially of the younger generation, are eagerly seeking for some find a solution for the problem which faces the religious world today. They know that the Church is needed, needed perhaps more than ever before in human history, and they also know that the Church cannot fulfill her function in life by standing aside and allowing outside philanthropic organizations to usurp her place, as they are now doing in all our large cities.




Plan of Cathedral Floor

form of spiritual expression which will satisfy their souls.

Many people say that in the new world which is now being born out of the World War there is no place for the organized church; that it has outlived its usefulness and no longer is in touch with modern life.

In the meantime, thoughtful men and women, within the church and without, are striving to

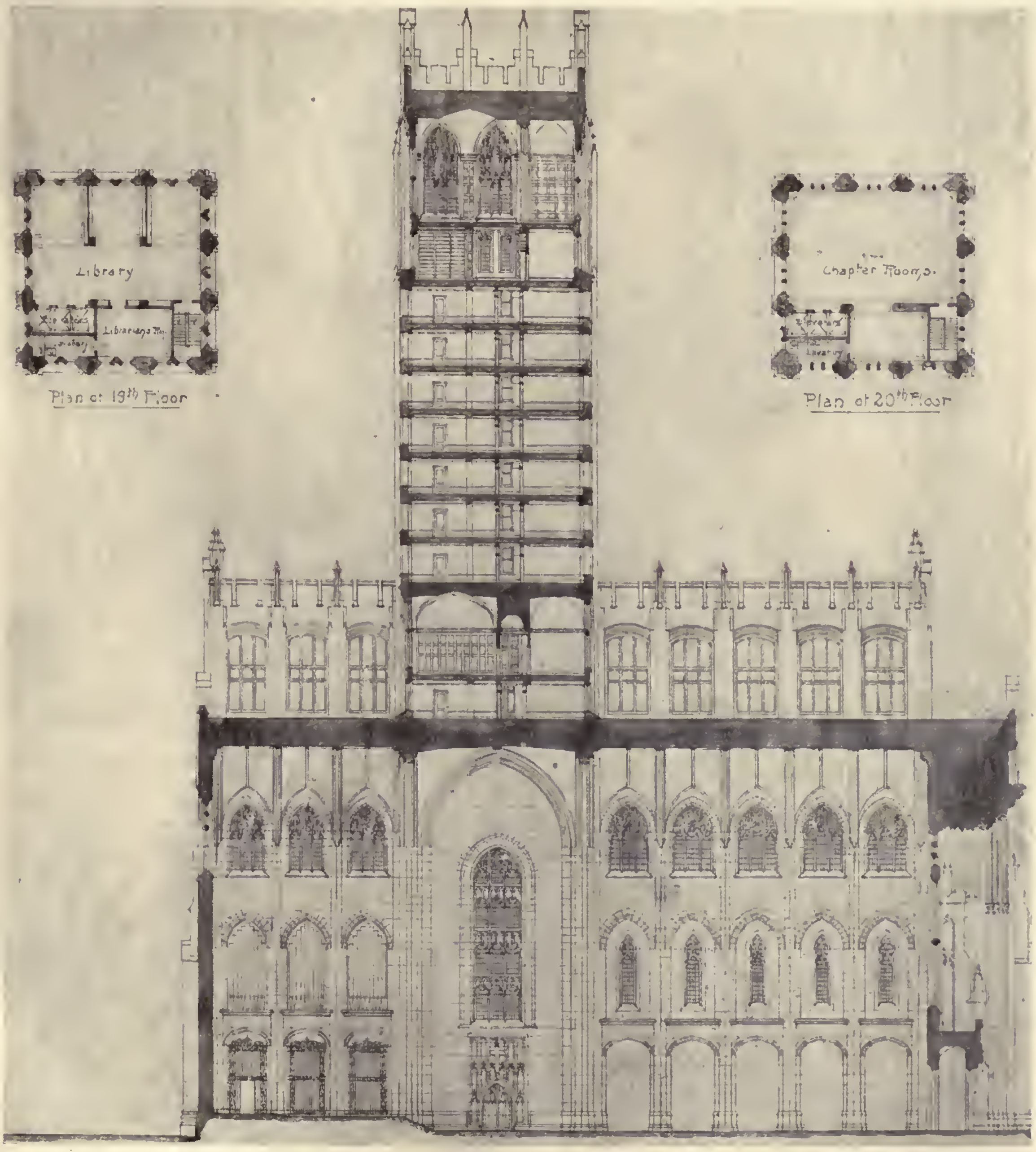
Christ's Church is not exclusive; and those churches which are moved from place to place to suit the convenience of the favored classes upon whom they, mistakenly I think, believe they depend for support are not Christ's Church but rather exclusive religious clubs. The populace regards them with indifference, if not open derision—they do not count.

The Diocese is the unit of organization in the

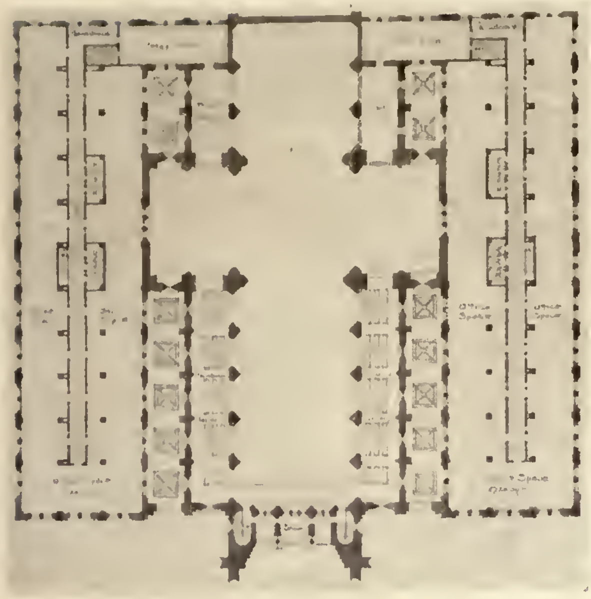
Episcopal Church and the Cathedral is the Diocesan Church. As such, it should be located near the heart of the Diocesan city; it should be surrounded with all those organizations necessary for it to function in modern life; and it should be open to those who seek solace for their souls, day and night. Today the necessary organizations for a metropolitan cathedral are large and numerous and demand, for their operation, a very large amount of floor space.

In order to secure space for all of these activities, the New York City Diocese located her cathedral on Morningside Heights, miles from the centre of the life of the city. The location is superb from the architectural standpoint but, when completed, at the cost of many millions, can it ever be a cathedral in the true sense of the word, the House of GOD for All People? I very much fear not.

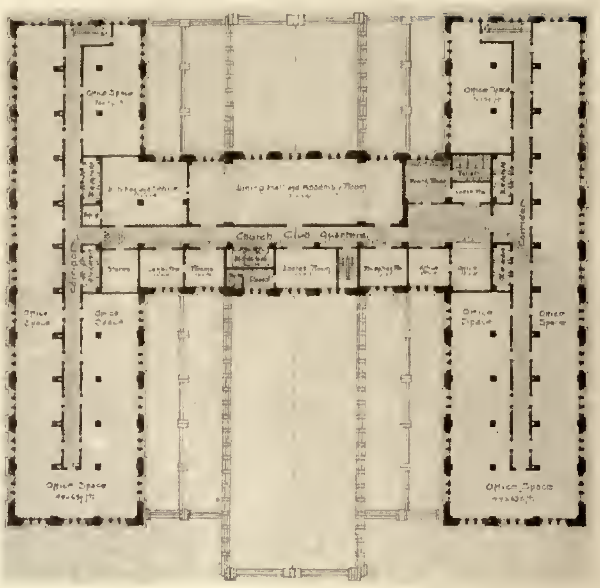
For the mass of people whom Christ commanded His disciples to reach, the cost of transportation to and from the New York Cathedral and the time necessarily consumed in transportation, make it practically inaccessible.




Longitudinal Section



Third Office Floor



Eleventh Floor

West Elevation

A MODERN CATHEDRAL FOR AN INDUSTRIAL CITY

ALFRED GRANGER, ARCHITECT


A MODERN CATHEDRAL FOR AN INDUSTRIAL CITY

ALFRED GRANGER, ARCHITECT

Next to New York, Chicago is the greatest commercial and industrial centre in the United States and her population is steadily increasing. Today she has no cathedral church, the old Cathedral of St. Peter and St. Paul having been destroyed by fire early in the year 1921. In Chicago land values, within walking distance of the "Loop" where the great hotels and office buildings are located, are prohibitively high and yet—if the Cathedral is to function; is to be the centre of the life of Christ's Church in this great industrial community—it must be located where the masses of the people from the down-town hotels, the apartments and the tenements can walk to it.

It must have, in immediate proximity to it, space to house the Executive Offices of the Diocese; the Church Club; the Woman's Auxiliary; the Visiting Nurses' Headquarters; a small Emergency Hospital; a staff for Rescue and Welfare Work; an Assembly Room for open meetings of social and civic character; an Employment Bureau and all those other agencies which are necessary if the Church is to function in our modern life as Our LORD intended it to function.

In the accompanying photographs of what I have called a "suggestion" for a Cathedral Building, I have tried to meet these fundamental demands in a modern manner which, if it should be adopted, would not only express its purpose in architectural terms but also be typical of Chicago, the most modern and, we believe the most expressive of Twentieth Century America, among our cities.

The building is designed to fit any one of several blocks on the east side of North Michigan Avenue south of the Drake Hotel, a district equally accessible to all sections of the city.

The dominant architectural note in the composition is, of course, the great cathedral church, thoroughly Gothic in plan and character and thoroughly in harmony with our Anglican traditions. The nave is 92 feet high to the crown of the vault and is lighted by clerestory windows, which are 40 feet away from the office-building walls. Additional light is brought into the galleries from lancet windows 20 feet distant from the office walls, while the memorial chapels and baptistry along the north and south aisles are lighted by skylights. High above the reredos at the east end of the chancel are traceried windows similar to those in St. Thomas's Church, New York. The whole scheme of fenestration is shown on a preceding page, giving a longitudinal section through nave and chancel.

A tower, 50 feet square, arises above the crossing to the full height allowed by the Chicago building ordinances. In the top story of the tower is located the Cathedral Chapter House, while one or more floors immediately below the chapter-house, as may be needed, are devoted to a church library.

The Church Club is shown on the plan of the eleventh floor, above the cathedral. This plan and that of the gallery floor, show the amount of floor space which can be subdivided as desired to house the many activities mentioned above.

It will be at once said that such a scheme is radical and does not express the Apostolic character of the Episcopal Church. I believe that that is just what it does express, in the language of our day, for an industrial and commercial community.

Washington is building a beautiful cathedral overlooking the entire city, a cathedral costing many millions more than the building suggested in this thesis; but Washington is not and never will be a commercial city, and this scheme would be as out-of-place, as untrue, in Washington as would their plan in Chicago.

A building such as here suggested, built entirely of dressed Bedford limestone, the Cathedral proper being of stone within and without, should cost, at current prices, approximately ($6,000,-000.00) six million dollars.

Canon Talbot has told us that the Washington Cathedral will cost approximately $14,000,000.00, it is the National Cathedral in the National Capital and is depending, for its completion, upon contributions from the entire nation.

Here in Chicago, we have no such field to draw upon for funds. Ours is an entirely different problem for a strictly commercial city.

In the accompanying sketches, which are only intended as a means of bringing out a possible solution for our needs, I have tried to express the dominant position of the living Church, functioning in every branch of modern life and satisfying the inmost longings of starving souls.

The following figures explain the approximate estimate of costs, based upon present prices and computed by competent and responsible structural engineers.

Estimate of Costs, Based On Current Prices Per Cubic Foot

| | cu. ft. | | per. cu. ft. | |
|---|---|---|---|---|
| CATHEDRAL | 2,520,000 | at | $1.10 | $2,770,000.00 |
| OFFICE BUILDING | 3,190,000 | at | .85 | 2,710,000.00 |
| TOWER | 325,000 | at | 1.50 | 485,000.00 |
| TOTAL | 6,035,000 | at | | $5,965,000.00 |

LANSDOWNE MEMORIAL MONUMENT

CLARENCE WILSON BRAZER, ARCHITECT

# *Doorway to a House on Benefit Street, Providence*

*(See reproduction of original drawing by O. R. Eggers on opposite page)*

*NO details of our early Colonial architecture have been more often photographed and sketched than those of the Colonial doorways in New England cities and towns.*

*The accompanying sketch is typical of early American architecture and shows with what skill and rare knowledge of form and good design the carpenter-architects of our early Colonial period set about their work.*

*The doorway that forms the subject of Mr. Eggers' sketch, as will be seen, is one of excellent proportion and the most correct design. Its artistic composition is greatly enhanced by the wrought iron newels and short hand rails placed on either side.*

72a

DOOR-WAY TO A HOUSE ON BENEFIT STREET,
PROVIDENCE, R. I.
*THE AMERICAN ARCHITECT Series of Early American Architecture*

its board of directors, take any action in these matters or through a competently directed special committee seek to refute in the daily press the oft-recurring slanders on the profession? Something should authoritatively be done about it, and the responsibility assumed by the body whose rulings on practice and procedure are the basic causes for all of this loose talk.

## Architectural Engineering

DURING his criticism of engineers functioning as architects, a noted British architect referred to this practice as "architectural engineering." It is actually engineering architecture, for architectural engineering is all engineering work done for, or under the direction of architects. It comprises the design and detailing of the structural framework of buildings, as well as the planning, specification and installation of light, heat, power, ventilation and sanitation. The Department of Architectural Engineering in The American Architect and The Architectural Review is conducted upon this assumption. The architect is, as always, the master builder and stands between the owner and contractor. He is the commander-in-chief of the forces marshalled to erect a structure; his principal assistant is the chief-of-staff; the architectural engineer, the chief of the services of supply; his clerks-of-works and inspectors, the line officers. The architect throughout the ages has furnished something the builder alone cannot furnish, something men need and which, when they receive, they greatly appreciate. It is more than the mere building of a house. It is an intangible thing, which one senses but can rarely define. This cannot be given by the man whose mind is absorbed in the osseous parts of the form and the material things which contribute to physical rather than mental satisfaction, however able he may be. Structural engineering made its first appearance in any standard dictionary about twenty-five years ago. Architectural engineering is not yet in the dictionaries. The first course in architectural engineering was established about sixteen years ago and the first students were young men who had entered school for a course in architecture, but whose interest in art forms was found to be inferior to their interest in purely structural details. Primarily structural, the course of study, in architectural engineering now includes all the engineering features of building work. The development of this engineering specialty has helped and not retarded architecture. It relieves the architect of much detail, and enables him properly to perform his function in the body politic, namely, to build pleasingly with due regard to fitness, service and economy.

GARAGE OF H. BELLAS HESS, ESQ., HUNTINGTON, L. I., N. Y.
HOWELLS & STOKES, ARCHITECTS

DETAIL OF TERRACE FRONT
HOUSE OF DR. LYNN L. FULKERSON, RIVERDALE, NEW YORK CITY
ARCHITECTURAL DETAILS FROM THE OFFICE OF

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DETAIL OF DOOR IN LIVING ROOM
HOUSE OF DR. LYNN L. FULKERSON, RIVERDALE, NEW YORK CITY
ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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ENTRANCE DETAIL

HOUSE OF DR. LYNN L. FULKERSON, RIVERDALE, NEW YORK CITY

ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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ENTRANCE DETAIL
HOUSE OF ROBERT FEIN, ESQ., RIVERDALE, NEW YORK CITY
ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

14 4

DETAIL IN DINING ROOM

HOUSE OF CLEVELAND H. DODGE, ESQ., RIVERDALE, NEW YORK CITY

THE MANTEL IS AN ORIGINAL FROM A HOUSE OPPOSITE FANEUIL HALL IN BOSTON. THE PAINTING ABOVE IS BY GILBERT STUART

ARCHITECTURAL DETAILS FROM THE OFFICE OF DWIGHT JAMES BAUM, ARCHITECT

14 5

ENTRANCE FRONT

HOUSE ON ESTATE OF CLEVELAND H. DODGE, ESQ., RIVERDALE, NEW YORK CITY

ARCHITECTURAL DETAILS FROM THE OFFICE OF

DWIGHT JAMES BAUM, ARCHITECT

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STREET FRONT, HOUSE OF JUDGE NASH ROCKWOOD,
WEST 246TH STREET, NEW YORK CITY
ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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GARDEN FRONT DETAIL

GARAGE ON ESTATE OF WILLIAM P HOFFMAN, ESQ., RIVERDALE, NEW YORK CITY

ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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ENTRANCE DETAIL
HOUSE OF EDWARD C. DELAFIELD, ESQ., FIELDSTON HILL, NEW YORK CITY
ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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VIEWS IN LIVING ROOM

House of Edward C. Delafield, Esq, Fieldston Hill, New York City

View at left shows Portrait of Hon. John Bigelow by Sargent

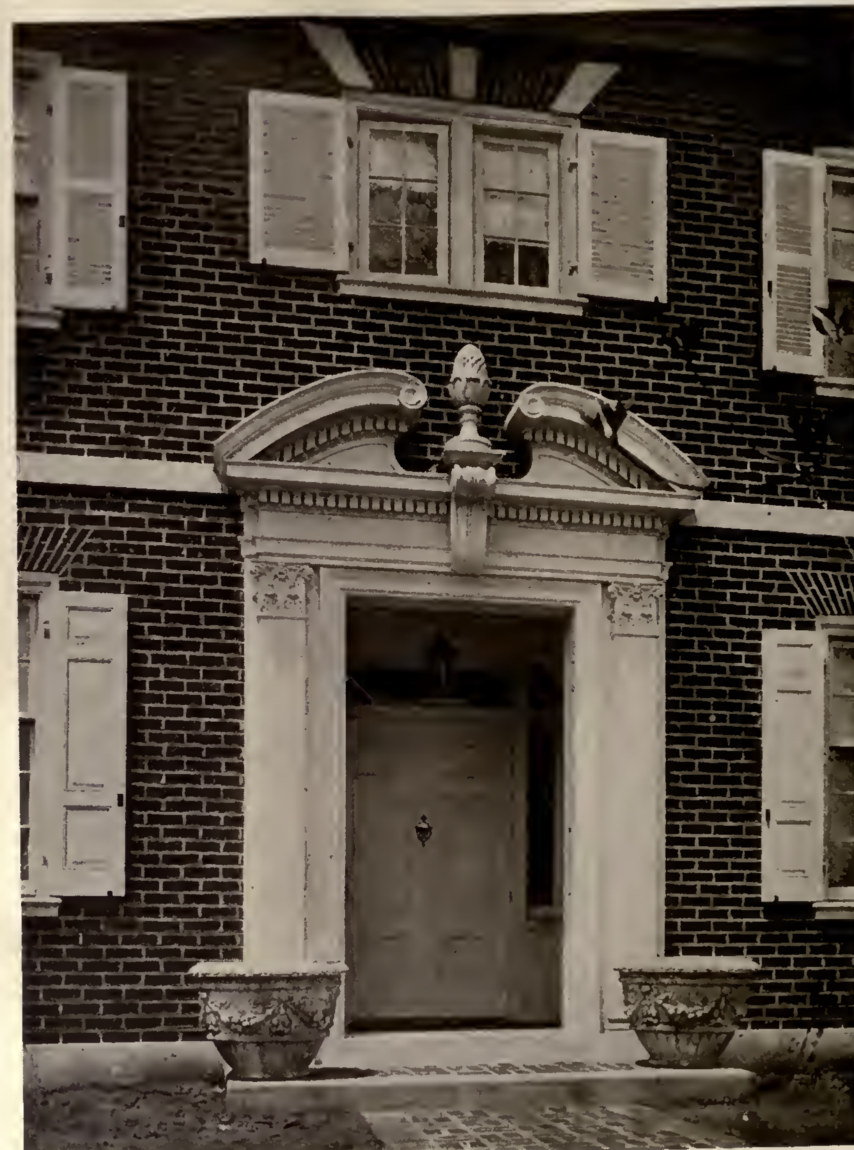
ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

VOL. CXXI, NO. 2384

JANUARY 4, 1922

ENTRANCE DETAIL

HOUSE OF JOHN I. LOLLER, LITTLE FALLS, N. Y.



ENTRANCE DETAIL

HOUSE OF M. E. SHEA, ESQ., RIVERDALE, NEW YORK CITY

DWIGHT JAMES BAUM, ARCHITECT

14"

STUDY ENTRANCE

HOUSE OF DWIGHT JAMES BAUM, RIVERDALE, NEW YORK CITY

DETAIL OF SUN PARLOR

HOUSE OF J. M. R. LYETH, ESQ., FIELDSTON, NEW YORK CITY

ARCHITECTURAL DETAILS FROM THE OFFICE OF DWIGHT JAMES BAUM, ARCHITECT

MAIN ENTRANCE DETAIL
HOUSE OF A. V. OLCOTT, ESQ., WEST 250TH STREET, NEW YORK CITY
ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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GARDEN FRONT

HOUSE OF JOSEPH BUSH, ESQ., RIVERDALE, NEW YORK CITY

ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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DETAIL OF TERRACE FRONT

HOUSE OF EDWARD P. SCHELL, FIELDSTON, NEW YORK CITY

ARCHITECTURAL DETAILS FROM THE OFFICE OF
DWIGHT JAMES BAUM, ARCHITECT

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ABOVE:—DETAIL OF SERVICE WING OF A HOUSE ON ESTATE OF CLEVELAND H. DODGE, ESQ., AT RIVERDALE, NEW YORK CITY

ABOVE, AT LEFT:—DETAIL OF GARAGE FOR DR. T. DUNCAN BULKLEY, FIELDSTON, NEW YORK CITY

AT LEFT:—DETAIL OF A HOUSE AT FIELDSTON, NEW YORK CITY

ARCHITECTURAL DETAILS FROM THE OFFICE OF DWIGHT JAMES BAUM, ARCHITECT

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# NOTES ON THE ILLUSTRATIONS

## The Lansdowne Memorial Monument

By Clarence Wilson Brazer, *Architect*

THE general theme of the design of this World War Monument is the upholding of the integrity of the World by the Allies and in particular our own America and the men from Lansdowne.

The earth depicted by a globe in full relief is guarded by four carved, victorious American eagles at rest with the olive branch of peace in one claw but on the alert with the arrows of war in the other. The supporting pedestal is crowned by a frieze upon which are carved the coat of arms of our country, alternating with the arms of our Allies, upon two garlands of twined laurel leaves symbolic of our victory. Interspersed are the insignia buttons of the four branches of the services, the Army, Navy, Marines and Aircraft. Below the frieze is a circlet of forty-eight stars representing each of our states. Upon the front face of the pedestal between two inverted palm leaves symbolizing heroic death are the names of our men who died in service, while upon the opposite side is to be found a dedicatory inscription of the appreciation by their fellow townsmen of the great sacrifices made and the inspiration given to future generations.

An endeavor has been made to make the monument noble in conception, heroic in size, restrained in execution, and withal unusual and monumental.

## Architectural Details from the Office of Dwight James Baum, Architect

FOLLOWING a certain method of illustrating the work of the offices of architects throughout the United States, there is presented in this issue a series of sixteen full page illustrations of the architectural details from the office of Dwight James Baum, architect, Riverdale-on-the-Hudson, New York.

As will be noted, most of the work illustrated is located in that part of New York City lying West of Van Cortlandt Park. This rather unusual tract of land has received the most careful attention in its laying out, and principally through the efforts of Mr. Baum's office, the character of the suburban dwelling erected in this restricted area leaves nothing to be desired.

While some of the houses have heretofore been, in part, illustrated in The American Architect, the details presented have not been shown before. They represent the character of the work of Mr. Baum's office and it is believed that they will have a large suggestive value.

## Well in the Abbey of Sassovivo, Foligno, Italy

THE Benedictine Abbey of Sassovivo lies among the hills about one and one-half hours (5 kilometers) from Foligno. The building is impressive. At one end rises the church with a low campanile and from it stretches a long and almost unbroken curtain of masonry behind which lie the conventional buildings. The ground on three sides falls steeply to the torrent far below. The buildings are now used by a farmer and within the gate is a scene of miserable squalor. The church and cloister, however, remain unharmed, and it is the cloister that forms the interest.

In the center of the cloister stands a well built much later than the cloisters and which bears the date of 1623. The designer is supposed to be M. Piero de Maria. One is struck by the beauty of the iron work and graceful outline which the perspective presents.

## Awards in Birch Burdette Long Competition

THE Birch Burdette Long Sketch Competition of 1921 for sketches of buildings or of an architectural character has just been judged at the Architectural League of New York by Mr. Howard Greenley, President of the League, Mr. Charles Z. Klauder of Philadelphia, Mr. Bertram G. Goodhue of New York, Mr. Birch Burdette Long of New York and Mr. Eugene Clute of New York.

The competition produced some exceedingly unusual and interesting sketches, all of which are going to be on exhibition in the League's rooms at No. 215 West 57th Street. This is but one of the many useful and very beneficial works that the League is now doing along with the policy of the educational program which has been mapped out.

The prize winners are as follows:

1st prize of $100.00 Mr. Kenneth J. Conant, Cambridge, Mass.

2nd prize of 50.00 Mr. Robert A. Lockwood, Los Angeles, Cal.

3rd prize of 25.00 Mr. Otto F. Langmann, New York City.

4th prize of 15.00 Mr. Elliot L. Chisling, New York City.

Six $10.00 prizes to:

Mr. C. H. Nelson, Alfred University, Alfred, N. Y.

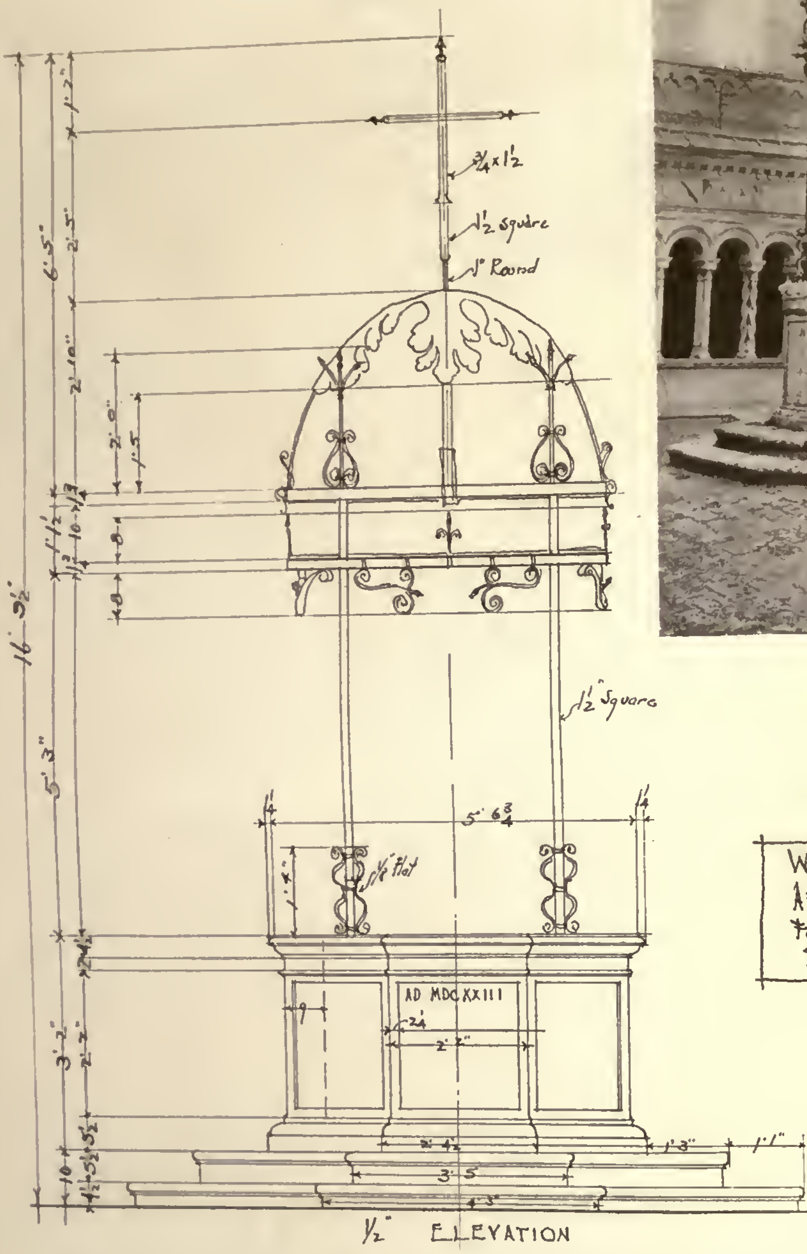
Mr. W. H. Butterfield, New York City.

Mr. John Wenrich, Rochester, New York.

Mr. E. Maxwell Fry, Liverpool School of Architecture, Liverpool, Eng.

Mr. Lionel H. Piries, West Philadelphia, Pa.

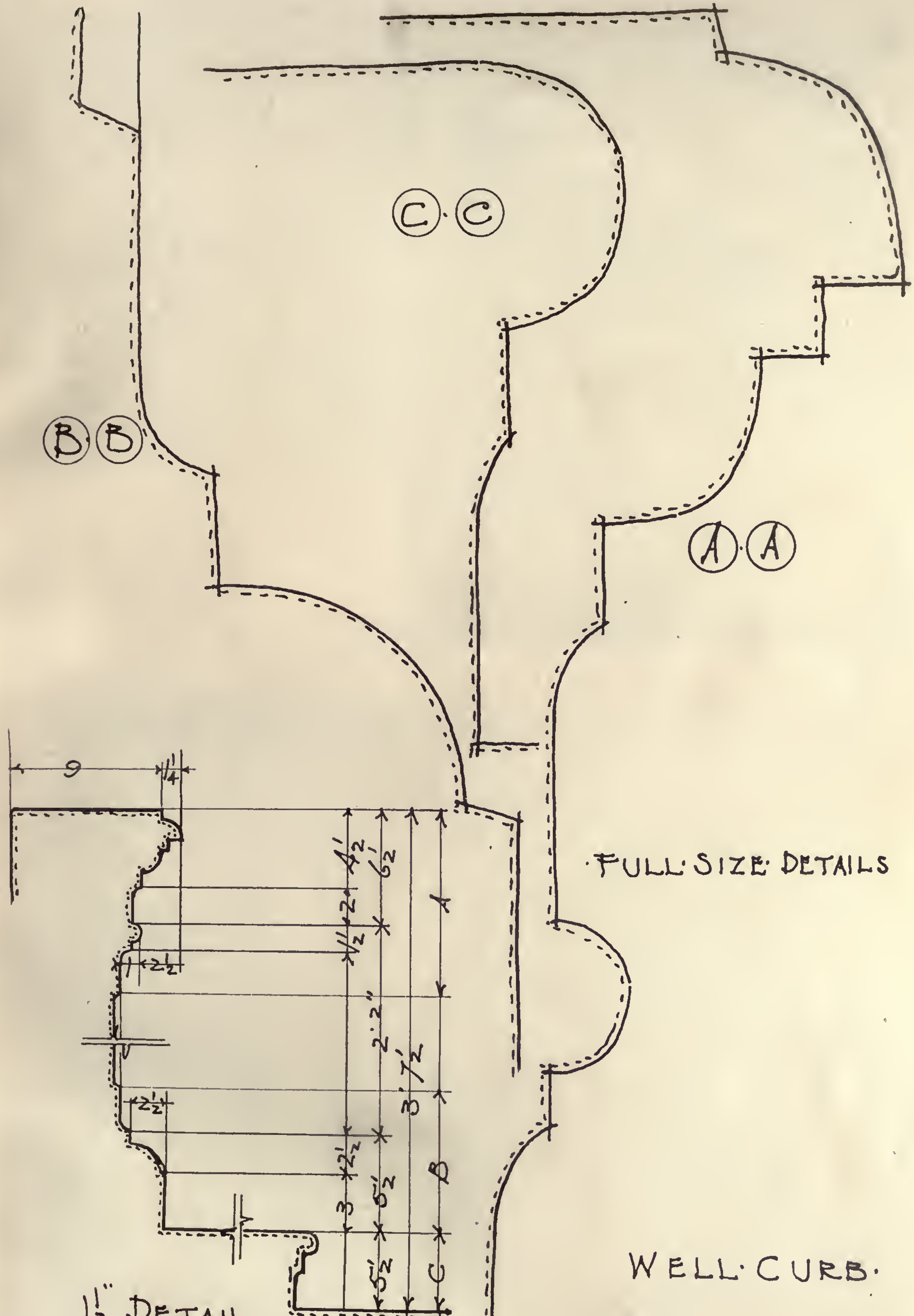
Mr. Arthur G. Wilson, Montreal, Canada.




WELL · IN · THE ·
ABBEY SASSOVIVO
FOLIGNO ITALY
4/21 RMB

MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

*THE AMERICAN ARCHITECT, SERIES II.*
*FRENCH AND ITALIAN DETAILS*

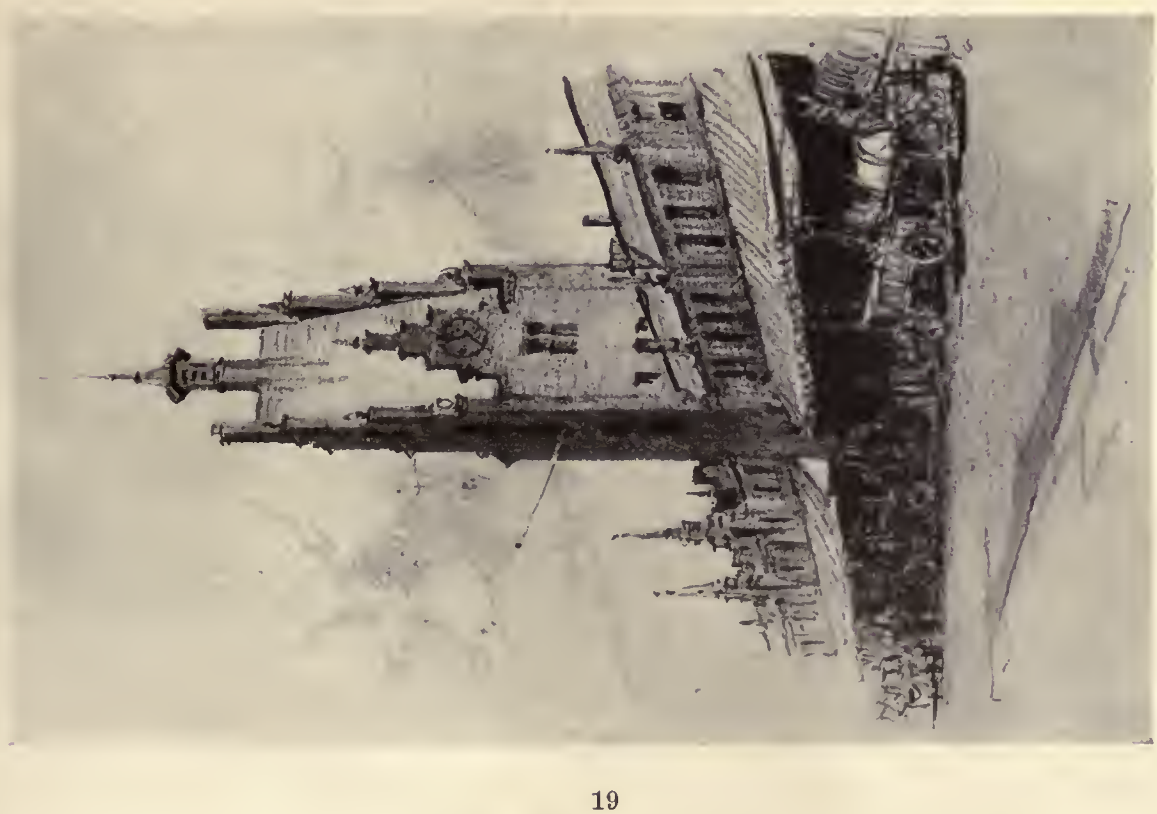



WELL IN THE ABBEY SASSOVIVO, FOLIGNO, ITALY
MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

## BIRCH BURDETTE LONG SKETCH COMPETITION

SECOND PRIZE—FIFTY DOLLARS
ROBERT A. LOCKWOOD, LOS ANGELES, CAL.

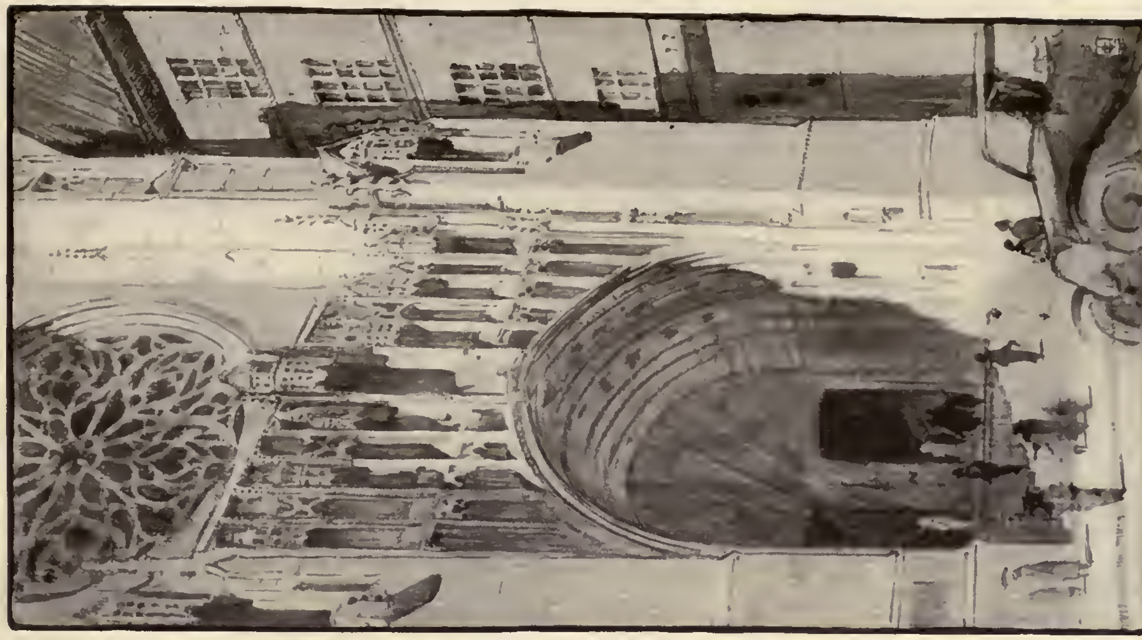
FIRST PRIZE—ONE HUNDRED DOLLARS
KENNETH JOHN CONANT HARVARD UNIVERSITY



THIRD PRIZE—TWENTY-FIVE DOLLARS

OTTO F. LANGMANN, NEW YORK CITY

BIRCH BURDETTE
LONG
SKETCH COMPETITION



FOURTH PRIZE—FIFTEEN DOLLARS

ELLIOT L. CHISLING, NEW YORK CITY

LIONEL H. PRIES, WEST PHILADELPHIA, PA.

E. MAXWELL FRY, LIVERPOOL (ENG.) SCHOOL OF ARCHITECTURE

A PRIZE OF TEN DOLLARS WAS AWARDED TO EACH OF THE SKETCHES ON THIS PAGE

BIRCH BURDETTE LONG SKETCH COMPETITION

ARTHUR G. WILSON, MONTREAL, CANADA

# LEGAL DEPARTMENT

Conducted by

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

I HAVE emphasized many times in the pages of THE AMERICAN ARCHITECT and elsewhere the very great desirability of the architect securing a definite written contract from his client, before proceeding with his work. Curiously enough, within the last ten days, I have had submitted to me two cases which led me to say a word of caution in this connection: If the architect is sufficiently interested in protecting his rights and placing matters on a business basis to secure a written contract, he should take such slight additional trouble as may be required to make sure that the written contract which he does secure is in proper form and covers the particular work in hand.

The ideal, of course, is for each architect to have a special form of contract adapted to the particular needs of his own practice. The preparation of such a contract is not a matter of great difficulty or great expense, and once the general form is prepared, it can be used repeatedly by the architect and readily adapted by him to the requirements of his different clients. The standard contract prepared under the authority of The American Institute of Architects is a good general form of contract. A contract prepared to meet the special practice and needs of each architect would be preferable, because manifestly no general form of contract, such as the Institute form, can meet all of the requirements of different architects with varying kinds of practice. If, however—and this is the point which I wish especially to emphasize—a special form of contract is to be used, it should be properly prepared and the architect should be sure that it does protect him, as it is meant to do, and that it covers the requirements of his particular practice. Unless he is prepared, therefore, to secure proper advice and have such a contract prepared in a proper way, he would much better adhere to the general Institute form of contract.

The two cases to which I referred above are good examples of the damage that may result where an architect undertakes to prepare a special form of contract himself or to accept, without proper advice, a form of contract presented to him by the client.

In the one case, the architect was employed to prepare plans for and to superintend the erection of a large public building. A rather unusual form of roof construction was a feature of the work. After the structure had been, as it was thought, completed, but before the final payment had been made or the final certificate issued, it developed that the roof and dome as built were defective and that this work would have to be rebuilt. The architect refused to give a certificate to the contractor, and required that the roofing be placed in proper shape. The contractor became insolvent and the owner undertook, under the terms of the contract, to complete the work and charged the expense of so doing to the contractor.

The work was properly completed in this way, and after the contractor had been credited with all sums due him and debited with the cost of repairing the roof, it was found that the total cost of the building did not exceed the original price which the contractor had agreed to do the work. The architect, however, by reason of the contractor's default, was called upon to attend to the letting of the new contract for making good the defects in the roofing and to superintend the removal of the old work and the installation of the new. As the job was a large one, this additional service called for a considerable amount of time and attention.

Upon the completing of the work, the architect felt that he was entitled to receive in addition to his percentage on the contract cost, a payment for the additional time and services rendered by him in attending to and superintending the reconstruction work made necessary by the default of the general contractor. As a matter of equity and on the basis simply of what would be fair, his position under the facts in the case was entirely reasonable. It appeared, however, that he had signed a contract, without receiving advice regarding it, and that his rights and the rights of the client were accordingly to be governed so far as the strict legal side of the matter was concerned, by the written contract entered into. The contract which he signed was in general and so far as it went, a good contract. It covered both the client and the architect fairly on most of the questions which should be covered, but it did not cover the situation as between architect and owner, arising from the insolvency of the contractor.

If the contract had been silent with respect to the rules of practice of the Institute, it is possible that the situation might have been saved by reading into the contract in some way paragraph seven of the present Rules of Practice of the Institute, which provides that if the architect be put to additional labor or expense by the insolvency of the contractor, he is entitled to be paid for the extra work and expense involved. The difficulty in the case to which I refer is, that the contract in that case made specific reference to certain provisions and paragraphs of the Rules of Practice of the Institute, such as article nine, covering the proportionate payments to be made and the time when they should be made, but did not make any reference to paragraph seven. The legal effect of this was to indicate clearly that it was the intention of the parties that only the paragraphs specifically referred to were to be incorporated in the agreement. This being so, it followed that it would be presumed to be the intention of the parties that the Institute provisions covering the additional payment to the architect in case of the insolvency of the contractor should not apply. So far as the legal situation is concerned, therefore, the architect has been placed in the position of having performed extra services of considerable value and involving a considerable amount of time, without having any legal right to request remuneration therefor.

It is evident that, in the case referred to, the architect would have been better off, so far as the specific point of this extra work is concerned, had he signed the Institute form of contract, or probably even if he had not entered into any contract. Had no contract been entered into, it might have been possible to argue that the established rules of practice of the Institute should by implication apply, and that under such rules, the extra payment sought should be paid.

THE second case to which I have reference is very similar. The architect prepared himself a written contract, covering the services to be performed. He prepared preliminary studies and full-size details and working drawings, made numerous trips personally or through his office representatives to the scene of the proposed work in a distant state, and then was notified by the client that the latter had decided not to make use of the plans and not to go ahead with the work contemplated. The contract, as drawn, provided for the percentage to be paid to the architect, but it did not specify the instalments in which the payments were to be made and was in fact so worded, as to give some ground for an argument that payment was to be made only in case the work was done. This was not, I am convinced, the intention of either of the parties, and yet the written agreement will control and cannot be ignored. If no contract had been made, the Institute rules might have been applied, under proof of custom, or if the Institute form of contract had been employed, the point would have been covered. Indeed, the architect could have sued for the reasonable value of the work done, without proof of any contract, and upon proper proof, have recovered the value of the studies, plans and details. As the matter stands, he has jeopardized this right by entering into a contract which puts it out of his power to proceed simply for the reasonable value of the work done, and by failing to include in this contract the ordinary provision covering the method and instalments in which the agreed fee percentage shall be paid.

I would not be understood as discouraging in the slightest the use by architects of the written contract. On the contrary, as I have already said, I have repeatedly urged the advisability, and in my opinion necessity, of securing in every case where it is at all possible to do so a definite written contract covering the relationship existing between the architect and the client. What I wish to emphasize in the present discussion is simply the danger of entering into the written contract without taking the small amount of time and trouble necessary to secure proper advice and be assured that the form of contract adopted is fair and has no pitfalls which are not apparent to the layman. The architect can, without difficulty and at very moderate expense, secure from his attorney a proper form of contract which will not only protect him on all of the points covered by the Institute form of contract, but which will protect him on the special points made necessary by the particular character of his practice and will be adapted to his own needs and requirements.

If the architect deliberately decides that he does not care to have any contract, in the belief that to insist upon one will jeopardize his relations with his clients, it will be entirely logical for him to proceed with his work, without any contract protection. If, on the other hand, he believes, as architects are more and more coming to understand, that there is too much involved to allow the matter of his compensation and other rights and liabilities to remain unsettled and in a purely nebulous state, and decides to place his work on a contract basis, then by all means he should make sure that the contract into which he enters is a proper one and protects him as it should protect him. If adopted upon proper advice and worked out with proper care, the contract will in all likelihood be the means of saving the architect many thousands of dollars, entirely aside from loss of time and misunderstandings with his clients. If it is adopted and used carelessly, however, without proper advice and without its form having been carefully considered—if the architect, in a word, is not prepared to see that the contract is properly prepared, if prepared at all—then he would much better adhere strictly to the American Institute form of contract or proceed on nothing more definite than the ordinary custom and practice of the profession.

# RECENT LEGAL DECISIONS

UPON the failure of one party to a construction contract to pay to the other instalments due him for work performed, the latter party (the contractor) has one of two courses open to him, viz: he may rescind the contract and recover what was due thereunder up to the date of rescission, or in the alternative, he may proceed with the contract and sue for the amount due. He can not, however, both rescind the contract and recover prospective damages.

*Ryan vs. Rodgers and Hagerty,* 197 *N. Y. A. D.* 662.

* * *

WHERE the contractor properly performs his work and the architect, acting under a mistake, refuses to issue a certificate, the certificate will be excused, where the mistake is of such a character, as to imply an arbitrary attitude or bad faith on the part of the contractor. Under this rule, in a case where the architect is not authorized by the terms of the contract to determine that the delay of the contractor caused a cement floor to break up, this refusal to issue a certificate on the ground that this was the case was a mistake which would excuse the non-production of the certificate by the contractor.

*Shine vs. Realty Company* (*Wisconsin*) 172 *N. W. Rep.* 750.

* * *

ORDINARILY, the architect may make his certificate on his own knowledge and on such evidence as he chooses to receive, without being bound by technical legal rules of evidence, but the fact that he believes the contractor has failed to comply with the plans in one particular does not justify him in acting arbitrarily in refusing certificates or arriving at decisions as to other particulars of the contractor's work.

*Lund vs. McClinton* (*Missouri*) 205 *S. W. Rep.* 240.

* * *

WHILE an architect is not disqualified from acting as an arbitrator, because he is in the employ of the owner, if it appear that, in addition to his professional relationship, he has any other personal interest in the matter involved, which may conflict with his duty to act fairly to both parties, the situation is thereby changed and the courts will be more inclined, in such a case, to hold that the architect is disqualified to act.

*Law vs. Toronto,* 47 *Ontario Law Reports* 251.

* * *

WHERE one architect is a silent partner, the certificate signed by another architect, who is an active partner, is sufficient.

*Board of Education vs. Wright-Osborne Co.* (*Utah*), 164 *Pacific Rep.* 1033.

THE term "working days" in a construction contract means days when the construction should be reasonably expected to proceed, weather conditions and the general character of the work considered.

*Contracting Co. vs. Kenmore,* 171 *N. Y. S.* 673.

* * *

IF an architect is familiar with the location of the property on which it is proposed to erect a building and prepares plans for the building, and it appears that the building cannot be erected on such property, because to do so would be in violation of a municipal ordinance, the architect cannot recover compensation for the preparation of the plans. This is true, even though he were directed by the owner to draw the plans, if the owner, at the time of directing him to do so was ignorant of the ordinance and the architect did not draw the facts to his attention.

*Bebb vs. Jordan* (*Washington*) 189 *Pacific* 553.

* * *

A BUILDER agreed to erect an apartment house for the sum of $33,000. He sublet all of the work which was done by the sub-contractors. The sub-contractors filed liens aggregating $27,000. One of the sub-contractors sued to foreclose his lien, which was for lumber furnished to the job, and made the owner, the general contractor and all of the other sub-contractors parties to the foreclosure proceedings. It was determined by the Trial Court that there had been defective work done, which occasioned damage to the sum of $3,300. The court held that while the general contractor was responsible to the owner for the defective work and materials of the sub-contractors, the latter were in turn liable to the general contractor, and that the $3,300 damage and loss occasioned by the defective work should be apportioned among the several delinquent sub-contractors and applied in reduction of their respective claims, if it were possible on the evidence submitted to make such an apportionment.

*The Capitol City Lumber Co. vs. Charles Sudarsky* (*Connecticut*), 95 *Conn.* 336.

* * *

A WORKMAN who is subject to the will and control of another with respect to the manner and means and method of doing his work is an "employee" of the other man within the meaning of the Workmen's Compensation Law of Connecticut. If, however, the workman has the right to use his own means and methods and is responsible only for the result of his undertaking, then he is an "independent contractor" under this Law, as distinguished from an "employee."

*Aisenberg vs. Adams Co.,* 95 *Conn.* 419.

# DEPARTMENT OF SPECIFICATIONS

### Foundations (*Continued*)

#### Piles

IN those cases where it appears necessary to use piles certain preliminary information must be obtained by the engineer responsible for the structural design of the foundations. One matter that must be given the attention of the specification writer is that of the nature of the soil and another is whether test piles have been driven and, from the information obtained, what assumptions have been made. These factors control the selection of the kind of piles and the specifications for driving them.

Ordinarily these matters have been determined when the specification writer gives the problem his attention, yet he should know of the controlling factors in order that illogical clauses will not appear in his specifications.

Piles may be either of wood or concrete. If of wood they may be driven with the butt down or, as is usually the case, with the tip down. It is rare that architects will encounter soils which are of such a nature that they require piles to be driven with the butt down in order to prevent their raising after being driven and therefore cases of this kind will not be considered. If piles are to be of concrete they may be cast in place or pre-cast and driven with a pile driver similar to the method of driving wood piles. Piles of wood or concrete may be driven to bed rock, in which case they will act as columns, or they may be driven until further penetration is almost impossible, in which case they assume true pile action. The specification writer should know just which piles are to be used and what function, as foundation supports, they will perform.

The following woods usually are used for piles: Douglas fir, spruce, cypress, Western cedar, Eastern white or red cedar, tamarack, longleaf pine, chestnut, redwood, white oak, burr oak or post oak. Douglas fir is obtainable in long lengths and is one of the most used woods for piles. Oak is rarely desirable for piles because of their weight and crookedness although, if they are available and length requirements do not exceed twenty or twenty-five feet, there is no objection to their use.

Wood piles should be cut when the sap is down, from sound, live trees and should be close-grained, free of ring shakes, large and unsound or loose knots and decay. Peeling of piles must be done soon after they are cut. In other words, only wood of the very best quality should be used for piles and the specifications must be quite explicit as to inspection and rejection methods. The piles should have a uniform taper from butt to tip and a line drawn from center of butt to center of tip should, (a) lie within the body of the pile or, (b) if it passes beyond the pile the distance from this line to edge of pile should not be greater than one-eighth of the mean diameter. Short bends are not permissible and long bends are controlled by the line measurements given in the preceding sentence.

The diameter of the tip rarely should be less than six inches and of the butt not less than ten inches. These sizes are determined by the engineering design in most cases, but it is well to establish certain minimum sizes, whether they are smaller or greater than mentioned above. The length of wood piles for building construction usually ranges from twenty to forty feet and, since this item is of interest to contractors, some mention of lengths, minimum and maximum, should be made.

Chemical preservation of wood piles should be given some consideration, even though piles that are constantly under water have been known to last hundreds of years. It is customary, in building work, to neglect this point and, in the majority of cases, neglect would not be particularly harmful, yet it will do no harm for the specification writer to be posted on this subject. Where piles are to be used in salt water locations or in soil that has fluctuating ground water levels, and it is desirable to have the piles extend above the average low water level, preservation of some kind must be considered.

The usual chemical preservative is a creosote oil, the character of which must be considered for each case. The piles that are to be impregnated with the preservative must be of good quality, that is totally free from decay or other defects of any kind. There must be a sufficient thickness of sap wood to insure the proper absorption of oil to accomplish desired results. As no general rules, other than the above, can be laid down the reader is referred to the Proceedings of the American Wood Preservers' Association and to bulletins issued by the United States Forestry Service, in which there will be found interesting discussions of this subject. The specification writer need only remember that chemical preservation is of benefit at times and should be considered when writing specifications.

Mechanical protection of piles is of advantage, at times, especially when chemical preservation is expensive and where metal plates can be applied to the vulnerable points with ease and in an inexpensive manner. This subject has been considered in bulletins issued by the United States Forestry Service, to which reference should be made for detailed information. These devices are, however, rarely used in building work.

Unless wood piles are to be driven in soft ground, where square tips are not objectionable, the tips should be provided with cast iron or steel shoes of conical shape, to facilitate penetration or else the wood tips themselves should be pointed. Metal shoes are desirable, especially in soil that is hard, such as clay or gravel. The necessity for shoes will be indicated by the results of test borings or by previous pile driving experiences in the immediate vicinity.

In practically all cases the butts should have steel bar rings fitted in place to assist in preventing brooming under blows of the hammer. The usual size is three-quarters of an inch thick by four or more inches wide. Inasmuch as brooming of the butts reduces the efficiency of the hammer the rings always should be used.

The shoes and rings should be fitted in place neatly and adjusted correctly in relation to the axis of the pile. It is particularly necessary to require that the shoes be fastened securely, otherwise their use will introduce complications more harmful than if they had been omitted. In all cases, the tips and butts should be cut square or at right angles to the axis.

WOOD piles may be driven by gravity hammer, usually called drop-hammer or by the steam-hammer. General consensus indicates a preference for the steam-hammer because of the lesser difficulty in all phases of driving work. Whether or not the specification should restrict the driving to a particular type of hammer depends on local conditions and available plants. In the final analysis the piles must be driven in a satisfactory manner, regardless of the particular method used to accomplish this result, and in most cases the choice of methods should be left to the contractor.

The specifications must require that the butt of the pile be struck over the entire surface by the hammer, for if the hammer is too small it will deliver the blow on an area smaller than that of the butt and cause the pile to split. Piles must be driven straight (unless they are batter piles, which are not often encountered in architectural work) and piles that change their position after driving has commenced must be withdrawn.

At times piles are driven by means of a water jet but as this method should not be used in cities it is unlikely an architect will have need to specify this method.

All broomed butts must be cut off, the butt ring removed and replaced and driving continued. Piles should be sunk at a uniform rate in order to minimize brooming or splitting at butt or tip. Further than requirements such as these the specification writer will find it best simply to depend on results and permit the contractor to accomplish them in the best way possible.

It is, however, quite important to be rather explicit in specifying the termination of pile driving. Good piles can be spoiled very easily by too much driving as they reach final depth and some persons believe several final blows, after desired resistance has been obtained, will secure extra resistance or additional bearing capacity. As a rule this is not so; it is only true when driving has been done improperly and final resistance has not been obtained. It is necessary therefore, to specify some standard or rule to determine the time when driving should be stopped. One specification reads as follows:

> "For drop-hammer; piles shall be driven to such depth that the last five blows of a three thousand pound hammer, freely falling fifteen feet upon a solid, unbroomed head, shall not produce an average penetration per blow of more than one-half inch.
>
> For steam hammer; the following formula shall be used,
>
> $S = WH/30{,}000 - 0.1$ average for each of last twenty blows.
>
> S = Penetration
>
> W = Weight of hammer in pounds
>
> H = Height of fall in feet."

The piles, after being driven, must be cut off at the proper height to receive foundations. The cut-off should be made below the lowest level of ground water and, if there be fluctuations in this level, proper consideration must be given this fact in order that one may be assured that piles will be wholly in earth that is constantly moist. If concrete capping is to be used the piles should be cut off only approximately at the correct level, as preciseness is not essential. If wood grillage or stone capping is to be used it is, of course, necessary to make the cut-off at exact levels. If piles have been treated with preservative oil the cut-off must be given very thorough brush coats to assure proper protection.

It is often desirable and sometimes necessary, to apply test loads on piles to give assurance that they are capable of sustaining the designed loads. Unless otherwise required, such as where building laws require tests of a certain form, the tests should be made on at least two groups of piles at diagonal corners of the foundation. The nature of the test proceedings should be determined by the designer of the foundations and the only function of the specification writer is to make sure that tests either are, or are not, wanted.

In soliciting bids for pile foundations the specification writer should call for bids per linear foot of driven pile that is driven in an acceptable manner. The approximate number of piles should be given and the probable number of piles in each of the various individual foundations.

### Concrete Piles

If concrete piles have been selected it is quite probable that one of the small group of patented piles now available will have been selected for use. In such case a detailed specification would be somewhat absurd as it is not likely that the selected contractor would consider it unless it were a part of his own suggested specification. If, however, it has been decided that bids will be solicited on the basis of a contractor providing a sufficient number of properly driven piles to support the designated footing loads it becomes necessary to prepare general specifications covering the conditions that must be considered in the preparation of the estimates for the several different kinds of concrete piles.

Concrete piles may be of two types, viz., precast or cast in place, and if one of these types is not acceptable to the architect it should be so stated in the specifications. Judgment as to the use of one or the other type must be based on purely engineering considerations and the characteristics of the soil and, of course, properly do not come within the scope of the specifications. If bidders are to be permitted to select the type of pile they should be informed of the geological nature of the soil, water levels, and, if the information given is based on test borings or on general knowledge and belief, resulting from previous experiences in the vicinity.

The specifications should cover the use of reinforcing steel if reinforcement is deemed necessary by the contractor. The specifications for reinforcement should be similar to those for general concrete reinforcement, which will be discussed in a later paper. The mix of the concrete and the placing of it are, in general, no different from that required for other work of a similar character (concrete columns), all of which will be the subject of subsequent discussions.

If test piles are to be driven before general placing of piles is commenced, or if all piles are to be driven, with test loads placed on certain selected piles, or groups of piles, such requirements also must be given in the specifications.

The specification writer should become familiar with concrete and wood pile construction through studying several of the available text books of value and, if convenient, he will do well to attempt the study of field work whenever possible. As piles are the foundation work it is quite necessary that they be used under the guidance of those who are, at least, somewhat familiar with the requirements that must be met. The reader must bear in mind that discussions in this department have to do only with specifications and engineering phases are not within its province, except as they control directly the work under discussion.

Other forms of piles, such as disk and screw piles, are encountered occasionally in marine engineering work but rarely ever in building construction. Sand piles have been used to compact or solidify soils on which broad foundations are to be laid. Since sand piles are not resorted to in architectural practice there seems to be no need of entering into a discussion of specifications for them here. This applies also to the disk and screw piles.

*(To be Continued)*

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

THE *Journal of the American Institute of Architects* is, as the name implies, an official publication. It is, or it should be, an authoritative medium for the dissemination of matters of interest to the architecural profession and for the publication of technical articles of educational or historical value. It could, and should, occupy a position comparable to that of the official publications in the professions of Law and Medicine. It must then be somewhat of a shock to the laymind, or to any mind for that matter, to find prominently featured castles in Spain, etchings of dancers, moving picture films in the most ultra cubistic manner, all thinly spread on a background of pessimistic socialism. To be sure the castles in Spain may have a certain educational value as illustrations of contemporary architecture. But there are other strings to the bow; in fact a pleasant indoor pastime, more uncertain than put-and-take, is the generally futile effort to anticipate just what the little group of earnest thinkers will do next. For Example, we find in the December issue a column quotation from the Manchester Guardian, the beginning of which would lead the casual reader to infer it was something about G. K. Chesterton and about architecture; but it proves to be very little of Chesterton and still less of architecture and chiefly an adjuration to sing "Ho Ro, my nut brown maiden." It seems a rather silly sort of thing to sing to any maiden whatever her complexion, but still it is innocuous, which most of the quotations from the Manchester Guardian are not, so by all means let us sing Ho, Ro, and be thankful that the quotations were not from the Izvestia of Moscow or the New York Call. Also in the Bucolic style is an article on Thatch in Over, Middle and Nether Wallop and elsewhere, the quaint illustrations of which were probably secured from the little packets of pictures which were fastened somehow beneath slabs of ground glass and labourously copied by little Victorian art lovers. In quite a different key are the etchings of William Walcot, five of which are published in this number. However they may be questioned as restorations, they are wonderfully pictorial and give a reasonably vivid, if exaggerated, impression of classic days. A pageant or a stage setting from the hands of Mr. Walcot would be worth going miles to see, and I don't doubt he could design a group of exposition buildings that for utter magnificence would put all other expositions in the shade.

R. Clipston Sturgis has an interesting contribution to the ever discussed question of professional charges on the cost plus basis, but the gist of the whole matter seems to be that there can be no agreement as to the best method. No two offices do exactly the same class of work and none do it in exactly the same way. If a principal does little of his own work, any fee or salary in his case would of necessity be quite different from that in the case of a man who did much. The flat percentage rate has doubtless many disadvantages and is often unfair to the architect and occasionally to the owner, but it is probably true that it will be generally found the most adaptable to the profession as a whole. In public work it is the only safe method.

From "The Architectural Record"

Stairway, Independence Hall, Philadelphia (1750)

*The Architectural Record,* November: In this number is featured the work of William Lawrence Bottomley, Part I, that is to say the article by Arthur Willis Colton has a great deal to say of Mr. Bottomley, his ideals, his work and his method of doing it, but has very little to say of the ideals, etc., of Lawrence Peck, Edwards Hewitt and E. C. Dean, the gentlemen who seem to have been at least equally with Mr. Bottomley responsible for the work therein illustrated. It is true that the concluding paragraph of the article makes a brief reference to these gentlemen but the whole tenor of the article and the unusual absence of the architects' names below the illustrations would easily lead to the inference that Mr. Bottomley was solely responsible for the design. Now in some instances this is not only permissible but just. Some of the work done by McKim, Mead and White is quite properly attributed to Mr. McKim, and it was generally understood that the work done in the office of Daniel H. Burnham was not all by Mr. Burnham, and these examples might be multiplied, but in the present instance there does not seem to be any justification to warrant such a distinction. Mr. Bottomley, I fancy, would be the last one to claim that there was. The whole thing is most unfortunate; unfortunate for Messrs. Peck, Hewitt and Dean in that they have been denied what is due them, and unfortunate for Mr. Bottomley in that he has, unwittingly of course, been placed in a false position.

The Plainfield Municipal Building, which is a poor name, by the way, for a town building, is cumbersome and has a certain smugness about it that seems out of place; Town Hall would be better if it only had a hall to warrant the title; the Plainfield Municipal Building, then, has already had most favorable criticism in a former review. It is a very unusual and distinguished building and is another instance of the good results of a competition properly conducted. The Turtle Bay development is a good idea and well done. The two photographs that are published do not give a very comprehensive idea of what it's all about, but it has been very fully illustrated elsewhere. The Port Chester High School is hardly as successful. It is a very difficult proposition

From "The Architectural Forum"

Entrance Portico

Smith Memorial Hall, University of Illinois, Urbana, Ill.

James M. White, Architect G. E. Wright, Associate Architect

to design a building that is all glass one minute and all wall the next, and there are very few solutions that have been found. In the present building the contrast between the brick and the white trimmings is a little violent and disturbing, and the building looks a little new and hard in spite of the good detail, but newness is a defect that soon wears off in a Public School and doubtless by this time it looks as if it had been built ten years ago.

Frank Chouteau Brown continues his articles on the Tendencies in Apartment House Design. The plan of one of the apartments illustrated in Walton Place, Chicago, is novel and seems to have interesting possibilities but nothing was gained by reproducing the elevation.

In the Portfolio of Current Architecture there is a very charming stair in a house in East 54th Street by William F. Dominick and some interesting interiors. The screen in the Dining Room, though excellent in itself is a peculiar feature which is hard to judge in a photograph, but the house must be extremely attractive in the interior.

A. Lawrence Kocher has another article on the Early Architecture of Pennsylvania. These are very valuable contributions to the literature of Architecture, and should be, and probably will be published in book form. One of the illustrations is a most unusual view of the stairway in Independence Hall and is here reproduced.

Mr. Charles H. Moore writes of University Instruction in Architecture. That there should be some sort of universal instruction in the Fine Arts everyone will agree, but who is to say how it shall be given. In the old days, and not so long ago, either, every educated gentleman prided himself on his knowledge of architecture,—he travelled, he collected drawings, he appreciated what was good, or pretended to if he did not, and even practiced in a dillitante sort of way. It was the right thing to do; it was the fashion, and it seems to me, that is crux of the whole matter. Can the appreciation of the Fine Arts be made fashionable or the proper thing, or rather can it be made popular? Possibly; but not by photographs, no matter how carefully they are mounted or cross indexed as Mr. Moore suggests; not by forcing upon the torpid minds of an uninterested class that all the styles naturally fall into three catagories, the trabeated the buttressed arch and so forth as Mr. Moore also suggests; nor by trying to tell a class of husky youths that the Greek Acanthus is more pointed than the Roman when their minds are entirely occupied in speculating whether or not Babe Ruth will make another home run. If it can be done, it will be done by the personality of the man who does it. If the instructor is popular, if he can talk well and hold the attention of his hearers, if he can make the thing interesting, and if

From "The Architectural Forum"

Smith Memorial Hall, University of Illinois, Urbana, Ill.

James M. White, Architect G. E. Wright, Associate Architect above all he has a saving sense of humor, those who take the course will come to like it and may possibly remember a little of what they have heard. Of course I am now speaking of the general run of students and not of those few earnest souls who take their art with a capital A. The difficulty would seem to be to get students to take the course, presupposing naturally that such courses are elective. In my own day nearly the whole class took Political Economy, not because they were the least interested in that subject but because Billy Sumner was a personality. We all took History of Modern Europe because Professor Adams made it one of the few really interesting courses in the University, and there were some that took Botany because it was a snap. Which shall it be, personality or a snap course? And then again it might be made compulsory,—I don't see why not. In New Haven we had to take Philosophy, two years of it, and were taught that the thinghood of a thing was not an extended somewhat, and other equally amazing facts; *Cogito ergo sum, etc.* Now I can't but feel if we put in the hours of those two years in learning something of Architecture and the Fine Arts in general we would have been much better off. But we are getting far away from Mr. Moore's article which gives somewhat in detail his idea of what could be taught in a University. It seems to me, if I could criticize such an eminent authority, that what he says is quite over the heads of the average class. Possibly when spoken in lectures and explained by photographs it might not be, but as a rule the professional talks way over the heads of those who listen and look wise and say "Yes, yes, of course." In common parlance they don't get it, but they don't want to confess that fact. I don't think the average student would understand or remember the three general categories mentioned by Mr. Moore; I don't think the structural truths that are really so fundamental would interest him at all; nor the points of detail. He would be interested in the history of the countries as expressed and echoed in their art; how they lived and what they did and why they built as they did; and what a Greek temple really looked like; the color, the life; how climatic influences effect the design; the wars that were fought and what their influence was; the spirit behind the great cathedrals; in other words, the history of civilization. I don't think you can teach architecture, or an appreciation of architecture, by looking at photographs of ruined buildings any more than you can give a boy an idea of Rome by teaching him Latin. Some of Walcot's drawings and paintings, for example, unauthoritative as some of them

From "The Journal of the A. I. A."

Boat Lane—Welford-on-Avon

From "The Architectural Record"

Main Façade

Municipal Building, Plainfield, New Jersey

W. L. Bottomley, Architect

From "Architecture"

Details, Residence, Mr. and Mrs. Sidney Homer (Louise Homer), Lake George, N. Y.

Edward S. Hewitt, Architect

are, would give a much more lasting impression of what Rome was like than half a hundred photographs of the ruins or restorations of them. We are too often accustomed merely to rattle the dry bones and think we see flesh and blood. I remember a day spent in the Roman Forum, or what remains of it, with the late Jesse Benedict Carter. In those few hours I learned more about what the Forum really was than I had ever learnt from all the books and photographs I had studied for years. The Architecture of the Past was once an architecture of a present, and if we are to conceive of it at all we must conceive of it as it was when it was.

*The Architectural Forum*, November: A Corinthian order is not necessarily a good order, because it was built in Rome some nineteen centuries ago nor is a Doric temple necessarily of pleasing proportion because it was built in Greece, and similarly not all the work done in Italy during the Renaissance was worth making a fuss about. A case in point is the Villa Cornaro which is fussed about considerably in the fourth installment of the Villas of the Veneto and which is called a *magnum opus* of Palladio. "Scamozzi" says the article "properly deemed this one of Palladio's most beautiful creations." If Scamozzi really said this, or if he really thought it, which is more to the point, his admiration for Palladio ran away with his judgment. As a composition it is bad; a high square boxlike structure with two narrow lateral wings that from the side are extremely ugly; a superimposed portico, badly proportioned and awkwardly constructed, this portico not really being a portico at all, for the end columns are engaged and form the termination of thin wing walls which are the sides of the portico and which are pierced by tall stilted arches. There is an isolated gateway which seems to serve no particular purpose, and another in the rear filled with iron work of the XVII century which seems complicated and shapeless, although in the article it is called "an achievement in wrought iron of such beauty that it somewhat inclines us to forgive the contemporary frescoes just alluded to." The frescoes are not illustrated, but if compared to them the iron work shines as an achievement the omission was considerate.

Harold F. Blanchard has an article on Ramp Design in Public Garages, an apparently practical solution of a modern problem. Smith Memorial Hall, a building for a School of Music at the University of Illinois is described at length and profusely illustrated. The illustrations are excellent examples of the value of good photography. The frontispiece, which is a view of the portico in sharp perspective, is a charming arrangement of light and shade, while another view from almost exactly the same relative point is bald and uninteresting. Exhibitors in our next Architectural exhibition will do well to note these two carefully. A good decorative tree and effective shadows will do much, particularly if enlarged almost to life size and printed in sepia; in fact a casual visitor to some of our exhibitions might imagine he had lost his way and was in the forestry exhibit. A great deal of care was taken in the construction of this building to make it soundproof. F. R. Watson, Professor of Experimental Physics writes at length on this subject. He is very frank in his conclusions and what he says is well worth preserving for reference.—The Essex County Tuberculosis Hospital is probably practical, in fact Mr. Reuben H. Dockham, who writes about it, is quite sure on the point, but architecturally it is no better nor worse than most such buildings.—Kilham, Hopkins and Greeley have a Recreation Building at New Holland, Georgia, the entrance front of which is very interesting and would be better if the octagonal porches on the end were not so insistent. A view more directly in front would show it to better advantage.

From "The Architectural Record"

Main Stair—Residence of Bayard Dominick, Esq., 115-117 East Fifty-Fourth Street, New York City

William F. Dominick, Architect

Peabody, Wilson & Brown show a picturesque house in Roslyn, Long Island, the general view of which is marred by a singular looking rectangle in the grass surrounded by little Christmas trees. It may be the house was designed on the Hambidge theory and this is a lasting record of how it was done.—Alfred Hopkins' farm buildings are always a joy. There are few who handle small work with the ease and charm that he does. The superintendent's cottage in this number is not one of his best, but is very simple and pleasing. Stanley Parker has a bully little house at Belmont, Mass. It is a house one could live in year after year and not get tired of, whereas the tenure of life in a picturesque house may be a question of days.—Under the general heading of Straight Talks with Architects, C. Stanley Taylor asks whether you will get your share? Apparently you won't, according to Mr. Taylor, unless you sell your plans as you would patent medicine or soap,—and as an instance of how to do it he tells of a prominent firm of architects filing plans for a large office building; shortly afterwards a new set of plans was filed by a younger architect and on inquiry it developed that the cost of the building according to the first plans was too much, and the younger architect, learning this, made a study of the plans as filed and revised them with the aid of a building manager and went with his plans to the hard headed business men who were in charge of the operation and annexed the job. Keen business acumen no doubt! and quite as well done as the soap man or the patent medicine salesman could do it.

Of what importance is a little matter of ethics when you are after your share or somebody else's? Decidedly these straight talks to architects are interesting, but the adjective seems ill chosen. Now this is not a diatribe against efficiency or practical knowledge. If an architect, or a firm of architects, accept a commission to design a large commercial proposition it is their duty to exercise as much care in the study of the practical problems as they do in the study of the architecture, but there is no excuse for one professional man stealing the work of another. Of course, if the client was dissatisfied and severed all connections with the first firm and paid them for their services he was quite justified in going elsewhere and the younger architect was quite justified in taking the work; but this does not seem to have been the case here. The average client goes only to a distinguished surgeon when he has to undergo a serious operation, and if enmeshed in the toils of the law, he consults a lawyer who has made a specialty of cases of that kind, and he usually goes very carefully into the ability and financial standing of his builder, but he selects his architect because his wife's cousin had a nephew who once knew John Smith an architect, who, for example, has only done country houses. They are very good country houses to be sure, but John Smith does not thereby qualify as an architect to do a large monumental building nor a large commercial one either. In all great eras in building the architect comes into his own, that is, the good architect does. The distinguished architects of the past did not get their reputation because of the size of their office force nor their ability to get work. The work came to them because of their talent and let it be remarked this talent was personal. The architect was really an architect, a designer, a master builder. The future of architecture here depends on the recognition of the architect by the client and by the public at large. If the client seeks he will find, but if he gives no thought to his selection, he can only blame himself if the results are barren.

From "The Architectural Record"

Entrance Steps—High School, Port Chester, New York

*Architecture,* November: In the opening article Mr. Ralph Fanning describes and illustrates the church towers of the Meuse. It is an interesting subject and makes one wish that the illustrations as well as the text were more fully developed. Dwight James Baum has some good pictures of Plymouth, and the Grace Dodge Hotel or Hostel, as the panel over the door has it, is shown somewhat in detail, and is a plain square sort of building with nothing about it to attract special attention but the two enormous doors which run up unmeaningly through the two lower stories. Edward S. Hewitt shows a house at Lake George, a simple comfortable sort of house in a charmingly natural setting; the wing with the enclosed porch is very good and would be better if the gable windows were a little smaller or differently shaped. A good feature of the house is the way it hugs the ground, the floor being only a few inches above the grade. Most houses are ruined by being stuck up in the air entirely unnecessarily. Old Lyme, an artists' colony, has built a Memorial Hall and publishes it in this issue. A more careful study of the many available examples of New England colonial work would have produced better results. Clinton Mackenzie's office is a clever utilization of the upper part of an old building, but it would be interesting to know just what happens on the other side of that large fireplace in the niche which balances the small grate; an ornamental oil stove perhaps, or some secret receptacle for the storage of—well, what every architect keeps in the safe nowadays. It's about all there is to put in the safe anyway. Mr. Jay Hambidge has a short article on Dynamic Symmetry and Modern Architecture. He says that he might say that architecture today is almost without proportion and that very few designers today know that the base of design is a certain element of formality which depends on symmetry, and that symmetry must be present before design can exist and further that the designer "may perform all the operations necessary with a string held in the two hands."—We have all heard of things being so easy that they could be done with one hand tied behind your back, but Mr. Hambidge goes this considerably better. While Mr. Harding is scrapping the navy Mr. Hambidge scraps the T squares. It is rumored that Schrell and Brock and Eugene Dietzgen are quite bitter in their denunciation of this theory. But in the article itself there is nothing new, nothing that Mr. Hambidge has not said before, nothing but a reiteration that Greek design is the best and the Greeks used this method and therefore, etc. There is no proof, no definite statement, no examples of anything accomplished. In the text there is reproduced what Mr. Hambidge says in a hitherto unpublished drawing by Michelangelo. It is a plan of a rotunda, a church, or possibly a tomb, the only unusual thing about it being eight pairs of coupled columns or piers in a circle within the dome and a sort of square box in the center. It might be a crypt under a dome, somewhat like Napoleon's tomb. The mysterious lines mentioned in the article are only the 45° lines by which the sketch was laid out. Mr. Hambidge could see thousands such in any architect's office, without going to Florence to find them. There are also some fragmentary sketches of Leonardo da Vinci, which also show guide lines and some notes made by a certain Villard de Honnecourt; and a sketch plan which the article says is the Cathedral at Laon, and that this "is a rendering of the symmetry theme of the building" and that this sketch was all the architect needed to "at any time and to any extent reconstruct the original." Now if any man could reconstruct Laon Cathedral or any Cathedral, or any thing at all from such a fragment as this he should give up architecture and seek a position as a restorer of fossil dinosaurs at the Museum of Natural History. The plan is apparently the plan of an octagonal tower with buttress surmounted by columns and with deep set arches with columnar reveals between the buttresses. It might mean something to Villard but it means nothing to anyone else and there is no symmetry theme about it. After the masterful exposition of the real thing by Mr. Kane in a late issue of The American Architect and Architectural Review, why lug in Michelangelo and Leonardo?

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## THE PLANNING OF AUTOMOBILE SERVICE STATIONS

### Illustrated by the Long Island City Service Station of the White Company

By WILBUR J. WATSON, M. Am. Soc. C. E.*

THE general requirements governing the design and construction of so-called "Service Stations," or local repair shops, for use in maintaining automobile trucks are as follows:

1. Large unobstructed floor areas to permit the direct ingress and egress of the largest size trucks. The standard five-ton truck, manufactured by the White Company, is about 7 ft. wide and 22 ft. long, with a turning radius of 30 feet.

2. Heavy capacity floors, capable of safely sustaining loaded trucks of the maximum size and capacity.

3. Ample light, utilizing natural light as much as possible.

4. Good ventilation, providing for the dilution and elimination of gases produced by the combustion of gasoline, and, in extreme cases, providing for mechanical removal of the heavy gases which accumulate near the floor.


Main Entrance of the White Company Service Station, Long Island City, N. Y.

5. The shop proper should be located on the main floor, eliminating elevators, and allowing maximum speed of ingress and egress.

6. A basement should be provided where practicable to provide storage space, mainly for new cars. The basement area is used mostly by the sales department for storage, assembly and distribution. It is therefore not properly a part of the shop.

7. The local sales offices of the company should be located on the mezzanine or second floor and be provided with a separate entrance.

8. The "Parts Department" should be provided with a separate entrance for customers. Here are made all sales of parts directly to the public and the supplying of parts to the shop. It should be separate and distinct from the departments for Local Sales and Repairs.

9. The Repair Department should be in four parts: the Inspection Room, the Shop proper, Machine Shop and Tool Room, and Blacksmith and Radiator Repair Shop.

10. The shop floors should be covered preferably with maple flooring, which furnishes a comfortable working surface and can be kept cleaner than any other type of wood floor.

11. To allow proper working space around each car with sufficient aisle space for rapid movement of cars the Shop proper should have clear spans of from 70 to 75 ft. between rows of columns.

12. The roof construction should be designed to give maximum light and ventilation at the center of the bay. The double saw-tooth type of roof has been found to be the most efficient for this purpose.

13. All divisions must be capable of expansion and the size of lot and design of structure must be such as to permit of ready expansion without

**President, The Watson Engineering Company, Cleveland, Ohio.*

sacrifice of working efficiency.

14. Vertical clearances should be not less than 13 ft. through shop doors, 11 ft. throughout the storage area, and 14 ft. under the trusses for the shop.

15. Shop roof trusses should be figured to carry a load of at least 1,000 lbs. applied anywhere on the lower chords.

Inspection Room—The White Company Service Station

The foregoing cardinal principles of design call for large ground areas, which requirement makes it impracticable to locate such stations in congested districts. They are being built, therefore, several miles from the business center of the larger cities, it having been found that this is of only slight disadvantage. In general, a site

Basement—The White Company Service Station

is selected which is as near as practicable to the center of gravity of the area to be served and is at the same time, approachable by well paved streets and accessible to labor.

Building codes in large cities generally class service stations with garages and insist upon fire-resisting construction, with fire walls separating the offices and Parts Department from the shop, a sprinkler system being installed throughout.

The type of construction recommended by the writer, and used wherever permitted by building regulations, is of reinforced concrete fireproof construction of the beam and girder type for all parts of the office and parts sections with flat slab construction for the basement and main floor. In the Repair Shop are usually exposed structural steel columns and trusses, with timber purlins and two-inch wood sheathing, carrying a composition roofing. Walls are of brick, with factory steel sash for the shop, storage and parts departments and double hung steel or wood sash for all offices.

The sprinkler system, although required in most cities, would seem to be hardly needed, as very little combustible material comes into these stations, for most of it consists of wooden bodies and these are being fast displaced by steel and composition bodies. Furthermore, chemical extinguishers are much more effective than water in fighting fire and these stations are all thoroughly equipped with such extinguishers.

General Shop—The White Company Service Station

### Description of Facilities

THE percentage of trucks undergoing repairs in any given territory, to the total number of trucks in use in that territory, varies greatly, but ten per cent. is in general assumed to be a fair average. In some localities practically all of this business would come to the service station of the company, while in others much of the work is done by owners of trucks who have their own shops. The number of trucks to be provided for is therefore governed by the experience of the local manager.

When a truck is in need of repairs it is driven, usually by its own power, into the Inspection Room of the Repair Shop through the truck entrance, which has a bi-fold or sliding door operated by compressed air. This door usually has a width and a height of 13 feet. Here an Order Clerk listens to the driver's description of his trouble and makes out an order for repairs. The machine is then driven to a designated part of the inspection room where it is carefully inspected by a workman. If the necessary repairs are slight and can be made in a few minutes' time the car is repaired immediately in the inspection room and is sent out without entering the shop proper. If the repairs are extensive enough to warrant putting the car in the main shop, the driver leaves the car and all loose equipment is taken from it and placed on a shelf in the Customers' Equipment Room, or "jail" as it is popularly termed. This is a separate enclosure in the inspection room equipped with metal shelves and enclosed in a wire grille. After stripping the car of loose equipment one of the workmen drives it into the shop where it is assigned space by the shop foreman.

The system of placing cars in the main shop requires that a passageway be maintained at the center of each 75 ft. span. The machines are then placed so that they head away from this aisle, in which case benches are located along the sides of the bays; or, the machines head towards the aisle and movable benches are used. A working space of not less than 4 ft. is provided for on all sides of each machine. This requires a floor space of not less than 11 ft. by 26 ft. for each five-ton truck.

Approximately over the center of the engine I-beams are attached to the trusses. These I-beams carry hand-operated hoists for lifting engines and parts off the chasses on to small hand trucks which are used to carry them to the machine shop or the "parts-cleaning vat," which is usually located in or near the blacksmith shop. A second line of I-beams is provided in one part of the shop for the purpose of lifting bodies off the chasses.

Electric current and compressed air outlets are provided at frequent intervals along the lines of benches for trouble lights, drills, pneumatic hammers, etc.

At the center of the main shop is a small office used by the shop foreman and by the requisition clerk. Pneumatic tubes connect this office with the parts department and the accounting room.

One machine needs new parts. At the request of the mechanic assigned to the job the requisition clerk makes out an order-slip for them and it is sent to the parts department. There a clerk places the articles on the delivery shelf between the shop and the parts department. Delivery boys on roller skates take it from the delivery bench to the mechanic who placed the order. If the part is too heavy or bulky to be delivered through the window, it is placed on a small hand truck and passed through a sliding door connecting the two departments.

Many parts are sold to customers who come for them and the percentage is so large that there are special counters for this purpose. Such customers have a special entrance where a stock record clerk determines from his card index whether the article wanted is in stock and its location. When the article is delivered to the customer the money, if it is a cash sale, is transmitted through a pneumatic tube to the cashier on the third floor. If it is a credit sale a slip is sent by tube to the credit man who approves the sale and returns the slip to the counter.

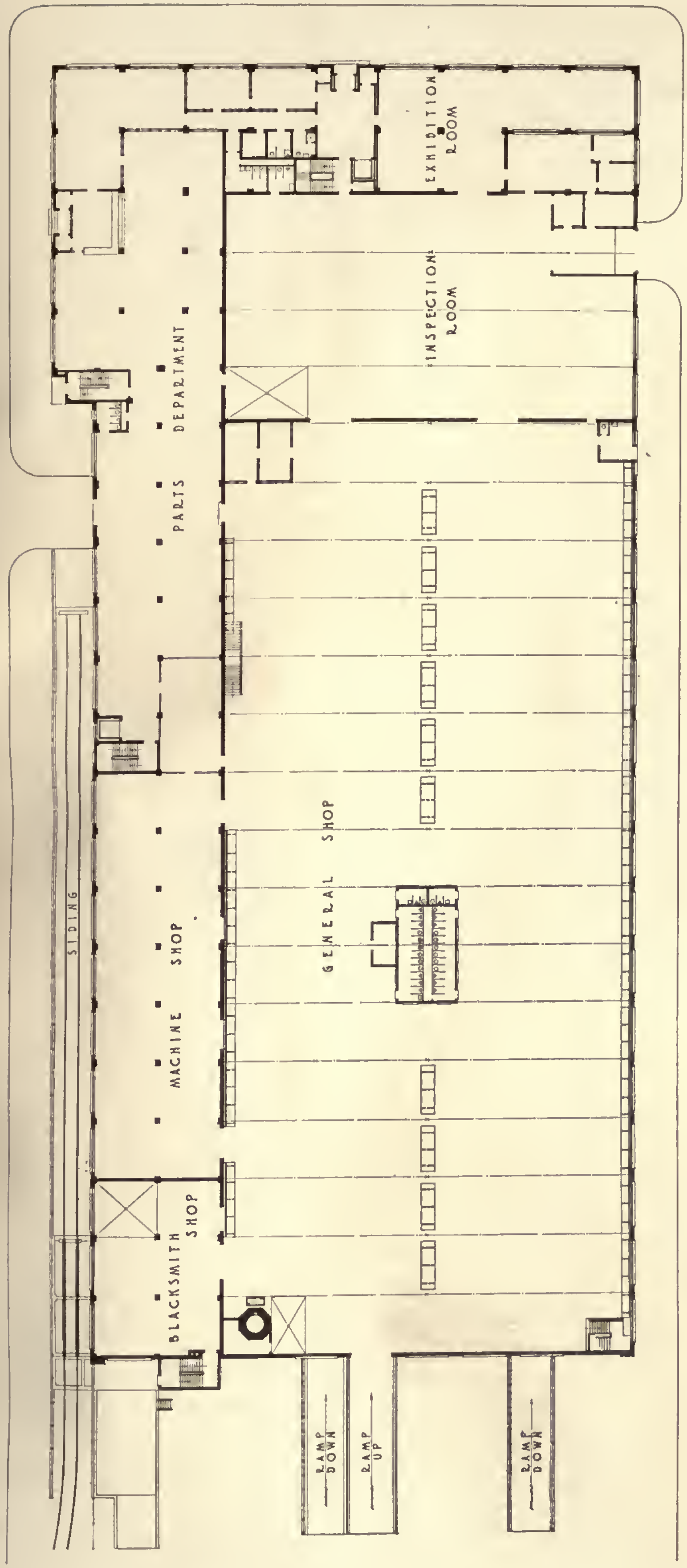
### The White Company Service Station

THE service station for the White Company, Long Island City, New York, was designed and built in accordance with the principles described. It is in the Borough of Queens, about 2,000 feet east of Queensboro Bridge Plaza and about 1,000 feet from the Dutch Kills Canal. It occupies a block 600 ft. long by 200 ft. wide, the building being 440 ft. by 200 ft.

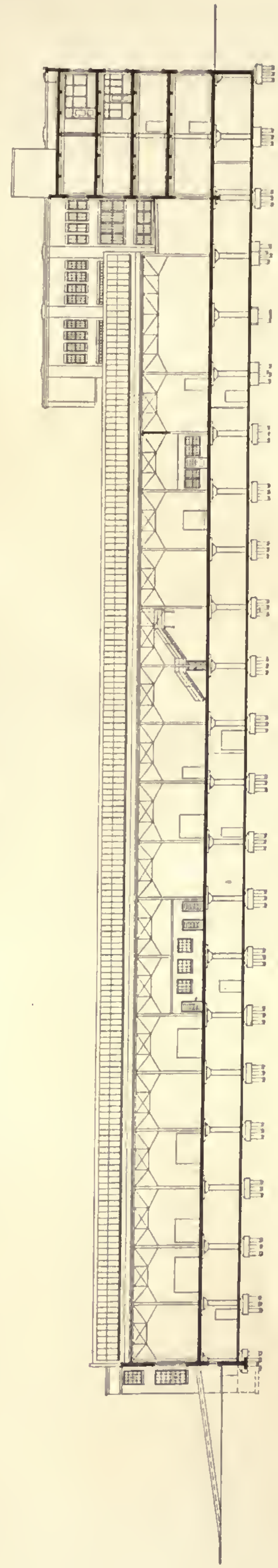
There are three distinct structural parts to the building: 1. The Office Section, having a basement and four stories, with provisions for adding a fifth story in the future. It is 45 ft. by 200 ft. on Thomson Avenue, with an angle about 55 ft. by 60 ft. along Mount Street. 2. The Parts Department, Machine Shop, Stock Rooms, etc., facing Mount Street, having a basement and two stories, the length of which is about 335 ft. and the width 44 ft. 3. The Shop proper, which has a basement and one story, the length being 395 ft., with a width of 150 ft. The first and second sections are of reinforced concrete beam and slab design. The third section has a reinforced concrete flat slab floor, exposed structural steel trusses and timber roofing.

The building site was formerly a marsh and the general level of the lot prior to starting construction was about seven feet below street grades. Wash borings and other tests made it seem best to use a rammed concrete pile having an expanded base or spread footing. Timber piles could not be used because of the probability of a decided lowering of the ground water level in the future. The boggy nature of the site made it advisable to neglect all possible frictional bearing value on the piles for the upper 22 feet of their length. Rock was found at depths varying from 33 feet to 59 feet below the bottom of the building foundations. It was decided to drive all piles to rock when possible and to have the least length of pile, when it was not practicable to drive to rock, 42 feet.

Two difficulties greater than were foreseen, developed in the driving of the piles. The driving proved to be much harder than anticipated, owing to the presence of a thin layer of cemented sand immediately underlying the mud. This also made the withdrawing of the cores difficult. A number of cores were broken and had to be left in the ground as they could not be withdrawn.

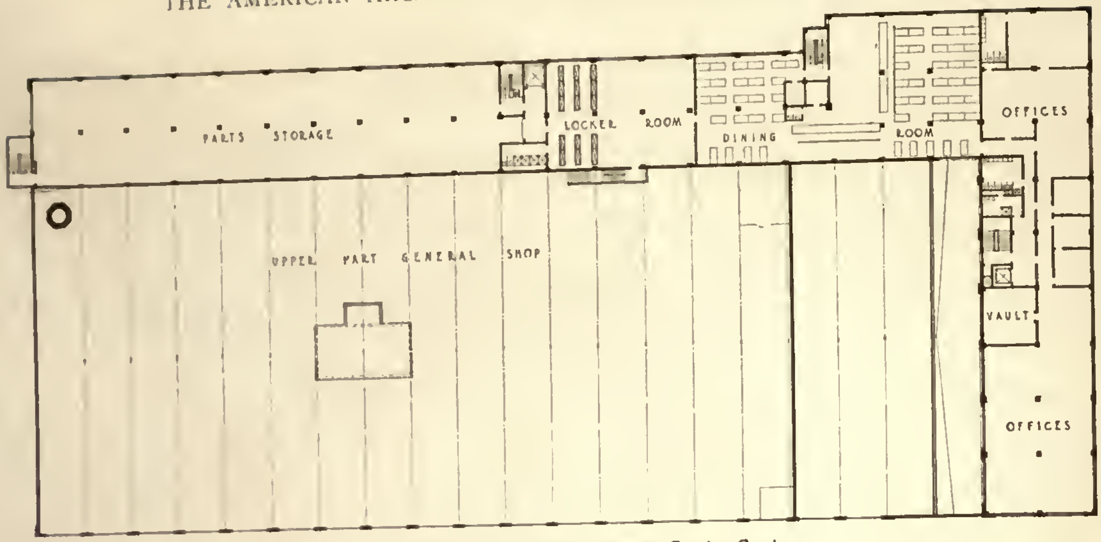



PLAN OF FIRST STORY



LONGITUDINAL SECTION

THE WHITE COMPANY SERVICE STATION—LONG ISLAND CITY, N. Y.




Plan of Second Story, The White Company Service Station

This thin layer of cemented sand was not indicated by the wash borings, a common defect of such borings. It had a thickness of from one to two feet and under it was soft sand into which the piles penetrated one inch per blow of the hammer.

The second difficulty was that the material overlying the mud, or bog, was more unstable than indicated by the borings. It was, in fact, so unstable that it was necessary to remove all excavated material and bring in material from outside the site for backfilling and, also, to reinforce the basement floor with metal.

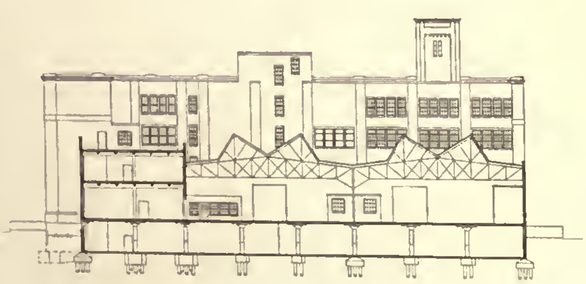
All piles were figured to carry a load of 50 tons each and were driven to a penetration of four blows per inch, using a No. 1 Vulcan Hammer.

The nearest arm of the sea is about 1,000 feet distant and the ground water on the site stood about 10 feet above sea level, or from 3.5 feet to 5.5 feet above the sewer levels. The explanation of this phenomenon appears to be that the site lies on an old creek bed, flanked east and west by impervious strata and shut off on the north by the fill forming Thomson Avenue and the roadbed of the Long Island Railroad, all of which act as a dam to hold back the ground water. This water proved to be very troublesome during construction, requiring constant pumping and proving to be a large item of unforeseen expense.

The basement columns under the shop are of concrete reinforced with spiral-hooping. The spacing is 19 ft. 8½ in. by 23 ft. 4 in. They range in diameter from 19 in. to 24 in., with a 4 ft. head, carrying a drop slab 7 ft. 6 in. square. The flat slab has a thickness of 9 in. reinforced four ways in accordance with the standard practice of The Watson Engineering Company, which consists in using, in addition to the usual four bands of rods, continuous bands of rods in the center of the panels, located near the top of the slab on a line between columns; and in the lower part of the slab at the centers of the panels. The function of this secondary system of rods is to provide reinforcement against unbalanced loads, not properly taken care of by the simple four-way system.

The office section and parts section are of ordinary beam and slab construction with brick exterior facing and suspended ceilings.

The shop roof is carried on exposed steel trusses on 19 ft. 8½ in. centers, 75 ft. span, double saw-tooth type, providing a clearance of 17 ft. from the floor to the underside of the lower chords. These trusses are figured to carry a suspended load of one ton applied at any point on the lower chord, in addition to the roof loads specified. Trolley beams are attached on which are operated hoists to lift engines, etc., from chasses. Ten inch I-beams are used for purlins, supporting 2 in. wood sheathing covered with five-ply composition roofing. The original intention was to use wood purlins but steel was substituted at the request of the Burough authorities.



Transverse Section, The White Company Service Station

The basement floor is cement finish throughout. The main entrance has art tile floors. All floors in offices are ⅞ in. maple laid on sleepers bedded in a carefully proportioned cinder concrete fill.

In the Inspection Room the floor is of cement finish. It was felt that the limited number of employees in this room made the use of wood flooring less necessary than in the shop as nearly all mud is removed from machines in the Inspection Room before entering the shop.

The shop floors throughout are of $1\frac{1}{8}$ in. square edge, No. 1 Maple, laid on 2 in. pine sub-floor, which is bedded in 1 in. tar-rok. This floor has a light colored pleasing appearance, is comfortable for the men to walk on and is readily cleaned.

The elevator service consists of one passenger elevator 6 ft. by 6 ft. having a capacity of 3,000 lbs. and a speed of 300 ft. per minute, and one freight elevator in the Parts Department 7 ft. by 8 ft., with a capacity of 6,000 lbs. and a speed of 100 ft. per minute.

Heating is by direct steam radiation, two pipe

Power requirements consist of a total of approximately 150 connected horse power in about 15 separate motors for elevators, air compressors, sump pumps, boiler feed pumps, hot and cold water circulating systems, etc.

The office lighting is the usual ceiling type of direct illumination, using standard reflectors of opaque glass, the intensity being approximately one watt per square foot of floor area. Base receptacles are located about every twenty feet for desk illumination, or machine operation.

The shop lighting is the regular type for this work using enamelled reflectors. The lighting in the basement is about $\frac{1}{4}$ watt per sq. ft. of floor area. The basement is served with current for extension cords by means of plugs located in the columns about 4 ft. 6 in. above the floor. The lighting in the basement is figured on a basis of storage space and not shop work.

Front view of the White Company Service Station showing Main Entrance and Entrance to the Inspection Room

vacuum system, providing 40,000 sq. ft. of radiation. The heating plant consisting of two boilers of about 150 H. P. capacity each, is designed at present to burn anthracite coal with provision for future use of oil. The building contains 52 water closets, 26 urinals, 7 slop sinks, 18 drinking fountains, 49 lavatories, 14 double wash sinks, 4 single wash sinks, 8 shower baths, 4 wash racks, 1 parts cleaning vat, kitchen fixtures, etc. All wash rack, cleaning vat and floor drainage is handled through oil separators in order that there may be perfect separation of oil, gasoline and water, as well as to prevent the entrance of gasoline and oil into the city sewers.

All electric wires are run in rigid metal conduit, embedded in the concrete or in the cinder floor fill wherever practicable. The switchboard is a five panel black slate board, 10 ft. long and about 8 ft. high, equipped with 12 breakers, I. T. E. "Autoite" type, total capacity 2,400 amp. for light and power, ranging from 100 to 300 amp. per breaker.

The Main Shop, Machine Shop, Stock Rooms, etc. are lighted in a similar manner to the basement with enamelled steel reflectors, the bottom edges of which are level with the lower chords of the trusses. The illumination is approximately $\frac{3}{4}$ watt per sq. ft. of floor area. The Main Shop is provided with outlets on every column and on the side walls opposite columns, at a height of about 4 ft. 6 in. above the floor.

The entire plant is also equipped with telephone conduits in order that wires may be pulled from the main telephone exchange on the fourth floor to any office or station in the shop.

The building is also equipped with a sprinkler system throughout; all sash are steel sash; mechanical ventilation throughout; pneumatic equipment with conduits to supply compressed air wherever needed for any required purpose; pneumatic tube system for transfer of papers from any office to any other office: gasoline storage tanks and pumps.

In the rear of the bulding are two reinforced


Rear View of the White Company Service Station, Showing Switch Track and the Ramps to Main Shop Floor and Basement

concrete ramps leading into the basement and one timber ramp leading to the main shop floor. One of the basement ramps is used exclusively for used cars and garage purposes; the other is used exclusively for ingress and egress of new cars. The ramp to the main floor is to serve as an emergency exit. Leading from the street to these ramps are cinder driveways of temporary construction. All details are so made that extension of the building to the rear may readily be accomplished.

The building was started in July, 1919 and was completed in July, 1920. It was constructed by the White Company, Cleveland, Ohio, to house the New York offices of the company, the New York sales offices and the Foreign sales offices. The design and construction of the building were in charge of The Watson Engineering Company, Cleveland, Ohio, Engineers and Architects. There were 33 separate contractors engaged in the construction work.

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# FELLING A FACTORY CHIMNEY

THE City of New York in order to build new piers on Staten Island acquired the property of Messrs. I. T. Williams & Sons, Tompkinsville, on which stood a factory chimney of perforated radial brick erected by the Alphons Custodis Chimney Construction Company in 1908.

The chimney had a height of 125 ft. with an inside diameter at the top of 7 ft. The wall thickness at the top was 7½ in. and at the bottom was 20⅛ in. Being designed for high temperatures the interior lining, 4 in. in thickness, extended from the foundation to the top forming a 2 in. air space. To guard further against temperature effects bands of 3½ in. by 5/16 in. iron were placed around the outside at intervals of 6 ft. It required four weeks to erect the chimney which contained 37,000 radial brick blocks weighing 175 tons. The chimney stood upon a concrete foundation 6 ft. deep carried on 64 piles spaced 2 ft. 6 in. center to center. The foundation was built in five steps, the bottom one being 19 ft. square with a thickness of 2 ft. The thickness of each of the upper four steps was one foot, the top step being 14 ft. square.

The builders of the chimney took the contract to raze it for the city. Fortunately it was possible to do this *en bloc,* instead of demolishing the brickwork by starting at the top and removing it in small sections, an expensive and time-consuming process. There was vacant ground on which the chimney could lie at full length and be taken to pieces at leisure. Plans were prepared to cause it to fall in a line which would take it near one of the buildings the corner of which was taken off to guard against any possibility of it being struck by the chimney while falling. The building was one of several to be removed for the proposed improvement so taking the corner off before felling the chimney was a precautionary measure taken as a matter of expediency merely because it was possible to do so at no increase of cost. When the chimney fell it did not touch the building but occupied the exact line selected in advance. Within 40 ft. of the chimney was a city pier, the building wall being nearly all glass, of which not a pane was broken.

Two days before the chimney was felled two men began to cut away the brickwork from the top of the concrete foundation to a height of 5 ft. A section 8 in. wide was first cut through one wall at a point on a line indicating the direction in which the chimney was to fall. When the wall was cut through an 8 in. by 8 in. yellow pine post was inserted in the hole and tightly wedged in place. About 5 feet on either side of this post two others were set in the same manner after which the brick wall between the posts was removed. The removal of the brick wall was continued away from the two outside posts until 55 per cent of the circumference was removed. The chimney then had a clear opening at the bottom 5 ft. in height and extending through an arc of 198 degrees, supported on three yellow pine posts. The middle post was then saturated with kerosene, firewood saturated with kerosene was piled around it and the other two posts were removed.

The work started on Monday morning Nov. 21 and at 2:55 P. M. on Wednesday a fire was started. At 3:50 the chimney started to fall. It went down as a unit until the top was about 30 ft. above the ground, when it broke in two places but did not shift or slip out of line. The iron bands on the outside and the lining the full length made the chimney stiffer than is usual, for nearly all chimneys in falling exhibit a "whip action." The force of the impact drove the chimney blocks about 2½ feet into the ground and the mass was so disintegrated that only a few sections held together in circular form identified it as having been a chimney. Many of the bricks broke before the mortar gave way, the perforations in the brick acting as keyways for the mortar which formed a solid mass with the brick.

This method of felling chimneys is stated to have originated with the constructors named and the Tompkinsville chimney is but one of many that have been thus razed.

### American Concrete Institute

THE program for the Annual Meeting of the American Concrete Institute to be held in Cleveland on February 13, 14, 15 and 16, 1922, will be spread over nine sessions, two sessions a day for three days and three sessions on the fourth day. These will be divided into two sessions for practical problems on the job; two sessions for concrete products manufacturers; one session on Roads; one session on Houses; one session on Research; two sessions on Engineering Design and Inspection. An active campaign is being made to increase membership. The address of the Secretary is 314 New Telegraph Building, Detroit, Mich.

### Standard Sizes of American Brick

THE following sizes of brick were adopted as standard by the American Brick Manufacturers' Association in 1918. This will answer several requests lately received.

| | |
|---|---|
| Common Brick .......... | 8 x 2¼ x 3¾ in. |
| Face Brick ............. | 8 x 2¼ x 3¾ in. |
| Paving Brick ........... | 3 x 4 x 8½ in. |
| Roman Brick ...........| 12 x 4 x 1½ in. |
| Norman Brick .......... | 12 x 4 x 2⅜ in. |

### Hendricks' Commercial Register

THE thirtieth annual edition (1922) of Hendricks' Commercial Register has made its appearance in a new form. The rapid increase in the industries listed made a bulky volume with the former 6 in. by 8 in. type page. The new edition has a type page of 7 in. by 10 in. which allows of 25% more matter on each page. Instead, however, of this reducing the 2800 pages to 2100, sufficient additional material has been added to make the total number of pages in excess of 2300. The work is valuable to all men who buy and sell anything, and everything, used by architects, engineers, contractors, material men, factories, mines, railroads, etc., and is also valuable for preparing mailing lists. It is published by S. E. Hendricks Co., 70 Fifth Ave., New York.

# THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago




The First Annual Conference
Report of Proceedings Continued From Previous Issue

Chairman Post: Gentlemen, we would like to have a short discussion of each subject after the matter is presented. We would like to spend fifteen or twenty minutes on this subject now and if any of you gentlemen have any questions to ask, Mr. Arnold will be glad to answer them.

Mr. F. E. Davidson: (President of The Illinois Society of Architects) I would like to ask Mr. Arnold this question: if the Barber Asphalt Company have made any series of investigations on the practicability of having the roofs of our buildings built absolutely level, without any pitch, and then building up a roof to take care of those conditions.

Mr. Arnold: There has been a good deal of thought given that subject. I hardly know just how to answer that question. I think that the thought originated with a competing concern and I rather dislike to get into an argument as to the relative merits of material under various conditions of that kind, and I would rather not at this time get into a discussion that would bring out or entail me into the argument as to the relative merits of the materials used in that kind of construction.

Mr. Davidson: You say that idea was started by one of your competitors. I think he started that at my suggestion. I made that suggestion to the Barrett Company about three years ago and asked them to investigate the possibility of building up a built-up roof that would be weatherproof on a flat surface. There are some reasons why a perfectly level roof is desirable, particularly in certain industrial plants. I think it has proven very satisfactory. We have had a number of buildings built that way and never had a leak. The argument in favor of it is this: the life of any roof is the life of the volatile oils in your flux, is it not? Now if you can have your roof almost level and there is moisture, the oils are not apt to evaporate quite so rapidly; that tends to make your roof last a little longer.

Another point I would like to mention here for the information of these specification writers is in regard to the uncoated roofs. Now I have had a very sad experience with the uncoated roof, without gravel on top. I made some investigations in the case of two buildings of exactly identical construction, one with the felt not covered with gravel, and the other, immediately adjacent, with the built-up roof with a heavy coating of gravel. I find that in the summer months the temperature of the upper story is very much lower under the built-up roof than it is under the uncoated roof.

Mr. Arnold: You mean they are built-up in either case.

Mr. Davidson: One is a Johns-Manville and the other a Barrett specification.

Mr. Arnold: Asbestos is known to be a very great conductor of heat units. That is a subject that is very interesting, too. There are a good many claims made for asbestos and some of those would stand a very careful investigation. In fact, I have suggested to our chief engineer and others of our organization that we have some tests made by disinterested laboratories along just such lines to determine from an unbiased standpoint just exactly what we could reasonably expect from these various materials.

Now speaking about that flat roof, do I understand you to mean, Mr. Davidson, that in your opinion we could expect a longer life from any materials used on a perfectly flat construction provided a waterseal is supplied? Is that your idea?

Mr. Davidson: I mean this: in our Chicago climate I would say under normal conditions there would probably be three months in a year when the surface immediately close to the roof is moist all the time, so your roof is actually under water twenty-five per cent. of the time. Now just in so much as you are covering that roof with a film of water, preventing the evaporation, you are increasing the life of that roof. That is the general theory.

Mr. Arnold: I would question very much whether moisture to that extent on a roof would preserve the life of any materials.

Mr. Davidson: I would like to add that the real reason for suggesting the flat roof is because in a great many of our industrial buildings today a building is built two or three stories high and designed for future stories.

Mr. Arnold: That is a thing I didn't want to get into.

Mr. Judd: (Engineer of Buildings, Illinois Central Railroad). It occurred to me that Mr. Arnold, in his talk, left out one important factor and that is the life factor. He put the reinforcing factor in there and left out the volatilizing or life factor. It seems to me an important factor that we should have something in that specification that would tend toward a long life. The Illinois Central has had some very sad experiences of disintegration of roofs under the rays of the sun and then, when they are disintegrated, they are blown off in the form of dust.

Mr. Arnold: I have always contended that a roof should be purchased with the idea of getting waterproofing. If a roof isn't waterproof, it is nothing else and its life is dependent upon the quality and quantity of the material used. If I were buying a built-up roof tomorrow I would first ascertain the kind of waterproofing that would go in it and then I would get the most in pounds in that particular type of material for the money that I cared to spend.

Mr. Judd: The trouble with that is that the very materials that are waterproof are the ones that sometimes won't stand the sun.

Mr. Arnold: Of course, when we are covering built-up roofing it is pretty generally understood that any one of those materials will withstand the sun. I don't say how long, and as I said before, the embarrassing part of it is I didn't want to get into discussion as to relative merits of materials available so much as to promote the thought that it was necessary to decide on one of those materials.

Mr. Davidson: May I suggest for the benefit of our friend of the Illinois Central that I have often thought that the life of our ordinary roof is dependent upon how much dust and dirt is blown on top of that roof after it has been laid.

I have had very unfortunate experiences with the uncoated roofs.

Mr. Judd: That is the kind I was talking about.

Mr. Beggs: I will say a few words to you concerning general specifications, mostly where they affect general estimating and the cost of the work. The general conditions are the first that come to an estimator's attention. I have found that most general conditions are entirely too ambiguous. They do not state definitely whether or not certain items are to be included. For example, the item of bond, which in itself is one and one-half per cent. of the entire cost of the work. Then there are such items as contingency insurance, various tests, fire insurance, certain allowances, etc. Quite often an estimator includes many of these items by inference, when it really is not the intention of the specification writer to have same included. Invariably contractors include in their estimate an item for contingencies. This is partially necessary because of the incompleteness or inaccuracies of the specifications, the contractor realizing that items will come up involving additional expense, which he must bear. These items sometimes become great hardships on the contractor; figures will be higher to some architects than others on this account. There are other uncertainties which the contractor has to contend with, which could be fully covered in specifications. For instance, in caisson construction, water bearing soil or other difficulties may be encountered which are covered by general clauses in the specifications in such a way as to hold the contractor liable, no matter what the additional expense, where as a matter of fact the owner should in all cases bear the additional expense of these unforeseen items.

Then there is the matter of writing specifications in such a manner so they will cover the different items that go into a building in their proper sequence; that is, start out with General Excavation—then follow with Trench Excavation, Concrete Foundations, Plain Concrete, Reinforced Concrete, Finished Cement Work—finish all concrete work and then go on with Brickwork and other masonry items. It often causes lo s of time and considerable confusion to the estimator, because of specifying, for instance, General Excavation, Trench Excavation, and then proceeding with the Brickwork, instead of following with Concrete Foundations, etc. In cases of this kind the estimator must follow a system of his own instead of being able to follow through with the specifications as should be the case. The idea I wish to make clear is that in taking off Trench Excavation quantities an estimator would naturally follow with Foundation Concrete, for the reason that they have to do with each other.

Many specifications are written in such a way as will necessarily add to the cost of building. For example, they require that concrete formwork be built certain ways and follow with considerable detail as to just how this should be done, the estimate being made up accordingly, whereas contractors using their own method of forming, which may be just as satisfactory, would in all probability be able to build same at much less cost. Strength and workmanship, of course, are essentially a specification requirement.

Unit prices are called for at times, the amount to be the same for either addition or deduction. This is not just, for the reason that at times it costs more to add than it does to deduct, and unit prices should be requested for addition and deduction separately: for example, wood piles, caissons, etc.

The time for completion of the work should be specifically stated, which puts competing contractors on the same basis. For instance, in figuring work in the Fall of the year one contractor may figure on heating materials and enclosing and heating the building, and another may figure to shut down the work until Spring. It necessarily follows that the contractor figuring to carry the work through the Winter would have a much higher bid.

Another bad feature in specifications is the wording, "Must meet the approval of the architect or engineer." Just what does it mean sometimes? It is hard to tell. The specification should be definite as to what the architect or engineer will approve, and so clear that there can be no doubt as to what the contractor must include to cover the requirements. Specifications in this respect should not be so worded that the contractor may include something costing less money which he conscientiously believes will pass and then be compelled to furnish something costing substantially more.

Concerning the matter of sub-branches: The specification should be written so a contract can be drawn for the various main and sub-branches separately. One of the most aggravating and nasty problems encountered in making up a bid, especially on large contracts, is that of the specification which places a great many separate and distinct branches under one heading, such as Ornamental Iron, Miscellaneous Iron, Fire Escapes, Steel Sash and Glazing, or Roofing and Sheet Metal. It requires a great amount of study and sometimes it is almost impossible to get the right analysis because of the different sub-contractors including items in their bids in such a manner that proper comparison cannot be made. Sometimes when time is short it becomes necessary to use a bid including all the branches, knowing that same is not low.

At the present time when everyone is working to the end of reducing the cost of building construction it behooves us to consider our specifications more seriously as to costs, rather from the standpoint of practicability than that of theory. I have in mind a certain specification which concerns the pouring of concrete; namely, that of requiring slump tests, which clause reads as follows: "The consistency of concrete and mortar shall be determined from time to time by means of slump tests conducted by the engineer at the contractor's expense. These slump tests shall be made by ramming samples of the mixed concrete into a steel shell shaped as a frustrum of a cone 12 in. in diameter at the base, 6 in. at the top, and 12 in. high. The steel shell shall be removed after the concrete is placed and the resultant slump in height of the mass shall not exceed an amount to be determined by the Engineer from tests conducted at the site, and in no case shall the slump or drop in the height of the mass exceed 2 in., except for concrete to be used in thin sections, where the slump shall not exceed 4 in." We, of course, realize more each day the importance of the proper consistency of concrete, avoiding excess water, as it affects its strength, but such requirements as I here cite are not practicable from the contractor's and estimator's standpoint. In this particular case where 50,000 yards of concrete are involved it would mean an additional cost of possibly $100,000 or more. Furthermore if this specification were rigidly adhered to, the concrete would be of such a dry nature that it would be impossible to work it around the reinforcing steel and get satisfactory results, and the item of patching would be very costly.

Specifications should be a matter of fact and not a matter of opinion. The one constant thought to be kept in mind is fairness to all parties.

Some specifications include standard printed clauses which seem to be so intentionally worded that they can be construed in an architect's or engineer's opinion, which is usually final, to cover any emergency which might arise and are at times worked unjustly and unfairly against the contractor. A standard fair specification made as clear as possible so no questions can arise from the owner's, architect's, engineer's or contractor's viewpoint, conforming with a standard fair uniform contract would be an ideal arrangement.

We will now continue the consideration of this subject from the viewpoint of the Contractor. Mr. Avery Brundage, Contractor, will now present his views on the Subject of Defects in Specifications from the Contractor's Standpoint in the Actual Construction of the Work.

Mr. Brundage: Mr. Post and Gentlemen: Learning from the roll call that I am the only contractor here, with the exception of Mr. Beggs, and knowing, therefore, I am among friends, I feel free to discuss specifications without withholding any of my thoughts.

Considering that nowadays most buildings are conceived today and wanted next week, including the preparation of specifications, plans, estimates, organization and everything else, I hesitate to criticize any man's work in connection with the building industry. However, there are some few things that we may say about specifications. In the first place, the average specification that comes into a contractor's office is barely legible; it is made on a multigraph by the office boy or copied by a stenographer, about eight or ten copies at a time, and the contractor can barely read it. I think that is one phase that should be improved.

Also, some specification writers should be made more familiar with the English language than they are and also the common methods of punctuation, because sometimes a period or a comma makes a great big difference in dollars and cents to the contractor and to the owner. There are various kinds of carelessness—punctuation, which I have just cited, omission of words, and also we encounter sometimes careless ideas. For instance, recently we had an alteration job in the sub-basement of one of the loop buildings in which the specifications called for all concrete to be mixed in a mixer operated by electricity. This job amounted to perhaps $10,000 or $15,000, and the cost of getting a mixer into that sub-basement might have been $25,000. Any contractor that figured he could mix that concrete by machinery would have missed the successful bid by about two hundred per cent.

The specification writer should perhaps know more about the building business than the architect, engineer or contractor. He has to cover all branches and provide the information for the contractor and do it for the ultimate good of the owner. Unfortunately, he oftentimes (the specification writer) doesn't know as much about some branches as he might.

One phase of this has already been referred to; that is, the arrangement of the specifications with respect to union rules and regulations and trade customs. This is rapidly being remedied by the actions of the National Board of Jurisdictional Awards, with which we are all more or less familiar nowadays.

The specification writer should know trade names and what they mean. Mr. Arnold has already referred to the necessity for that information in the specification.

The specification writer should know what can be done. If he did, in many instances he would not use the language he does nor the figures that he does. For instance, a standard specification for years has been that red lead paint shall contain thirty-three pounds of red lead to the gallon, which is a physical impossibility; you can't sustain thirty-three pounds of red lead in a gallon of linseed oil.

The specification writer should know and realize the effects of some of the practices and procedures that he specifies. He should not be too precise in his specifications, because he certainly cannot cover all the individual items in a building, particularly a large building, and if he attempts to be precise and is yet not complete, the contractor has the privilege of assuming that he is precise and neglecting to estimate the things that are not specifically mentioned.

Furthermore, in this same connection, a specification writer cannot hope to cover every possible contingency in his specification. I have in mind a case that occurred some years ago in which an owner wished to waterproof some balconies that projected over the sidewalk and that leaked during a rain or snow storm, on the pedestrians below. He contracted with a contractor to do this waterproofing, one who was not familiar with the uses of concrete as a waterproofer and not familiar with various other standard methods but familiar with the use of a low price, which seems to be the redeeming feature in many owners' and architects' minds.

At any rate, he put about three-quarters of an inch of concrete on the floor of these balconies without making any special effort and without protecting it from drying out too quickly, and it dried out and cracked and the balconies leaked as much or more than they did before they were waterproofed. The building owner refused to pay for this work and the contractor sued and unfortunately he secured the use of a more clever lawyer than did the building owner and that lawyer convinced the jury that the concrete did not leak, but the cracks did and he was, therefore, entitled to his money.

As well as not attempting to be too precise, while that is not as common a failing as the opposite of being too broad, the specification writer should not attempt to indicate or complete all of his specifications in one sentence, such as some that we have seen which state that the contractor shall include everything necessary to build the building, whether it is on the plans or specifications or not. That kind of a clause costs the owner a lot of money ordinarily, and it occupies a very prominent place in the contractor's estimate in the dollars and cents column.

A specification writer should be conversant with the adjectives contained in the English language and when he specifies that a ventilator should be sheet metal, he should state what kind of sheet metal, whether it is lead, copper, galvanized iron or plain iron and what gauge it should be.

He should also specify, and be precise, in the kind of equipment, although he should avoid the direct use of any particular manufacturer's product without the term "or equal." I have in mind a certain specification which called for a steam specification in a rather large job without the use of the term, "or equal." The first figures we got on this specification were $13,000. It was a small item in the heating equipment. It should have been a small item in the heating bid. When we, after some months' negotiation, got the consent of the owner and architect to use another device of the same nature and just as good and just as expensive, this man's bid was reduced to slightly over $3,000 for the same thing that he wanted $13,000 for when he thought that he had it sold.

Broad clauses, without relation to the plans, that appear in some specifications are very hard to figure, such as, "All exposed pipes and conduits shall be encased in wire lath and plaster." To figure such a clause accurately might take as long as it did to draw the plans for the building.

In other words, a complete layout of the mechanical branches would have to be made. It is impossible for the contractor who has to figure a job in a few days to do that and the result most certainly makes for a great and wide variance in bids.

One thing the contractor objects to, which may not be the fault of the specification writer, is the request for a great many alternates in a bid. The specifications will call for a price on the use of a certain kind of marble and another kind of marble and Caen stone and sand plaster. As a contractor it is my impression that an architect should have sufficiently accurate information on prices or should consult with some reliable contractor that he has faith in and get that information before asking some eight or ten contractors to go to the expense of figuring in detail. We had recently to figure a job which was asked for four different ways, which meant that our estimate cost us in the neighborhood of a thousand dollars on that particular building. Fortunately we got the contract but some dozen other contractors did not and that goes into the contractor's overhead and makes the cost of doing business that much higher and consequently reacts against the owner in the long run.

The practice of specifying ornamentation rather than showing it, thus leaving it to the individual contractor to interpret just what is wanted, is a very evil one and it allows for a great deal of latitude in bidding. This is particularly true in plastering work and ornamental iron and cast work, and bids in these branches, which ordinarily vary enough, will vary two or three times as much as they should because the plans are not definite and it is attempted to cover in the specifications what should be shown on the plans.

Very often specification writers use standard clauses that do not apply to the job under consideration. Of course, this is the result of a lack of time perhaps, but the contractor feels that if he is compelled to read the specifications the specification writer certainly ought to be compelled to read them once, anyway.

The worst thing of all, I believe, in the way of specification errors is the attempt to cover methods instead of materials and quality of workmanship. As a contractor I don't believe it is the architect's business or within his province at all to dictate how we shall do our work. It destroys the contractor's initiative and compels the good contractor to fall to the level of the average or poor contractor. I have in mind a caisson job where the architect specified the use of three inch lagging in four foot lengths with extra heavy rings and drums all the way to bed-rock. It would have been far better to have stated that the contractor was responsible for all settlement and allowed him to figure out what was necessary in that particular location.

I ran across a clause the other day that I thought was a good one in this connection and that was, "The contractor shall be required to use proper care and diligence in bracing and securing all parts of the building against storm, wind and frost. He shall be his own judge of what is proper and if it doesn't attain the end of protecting the building, he shall be responsible." That places the responsibility with the contractor but does not attempt to dictate to him how he shall do it. I have seen specifications, for instance, for backfilling, which specified that dirt shall be thrown in in six inch layers, wet and tamped and followed by another six inch layer, so as to avoid settlement. If the contractor follows that procedure and settlement results, I hold that he is not responsible for that settlement.

Of course, there are lots of things done backwards in the building business. One of them is the attempt to secure the best contractors on the lowest bids. Another is an attempt to bond all contractors when as a matter of fact the owner should be the one that is bonded. The contractor puts his money into the building and takes all the chances and usually has to wait six or eight months for a final settlement and then sometimes doesn't know whether he is going to get it, and the proportion of times when the bond should be carried by the owner far outnumbers that when it should be carried by the contractor.

As a contractor, I am very glad to see an institution like this body organized and studying the subject. The building industry is a business that never has been and probably never will be thoroughly organized in any branch. One of the hopes of this last generation is the fact that there are more and more organizations, such as the Associated General Contractors of America, studying the aspects of the business with an attempt to improve standard conditions, and The American Specification Institute should fill a great void in this industry.

Of course, specification writers are being helped by the national associations of material dealers such as the Portland Cement Association, the Metal Lath Industry and the Face Brick Association in developing standards and cutting out duplications and making for better building at less cost.

Mr. Davidson: Mr. Brundage suggested putting in the term "or equal." I would like to know what the general reaction of that point is.

Chairman Post: Is your question a question of whether you should specify trade names or if you specify trade names, should "or equal" be put in?

Mr. Davidson: Yes. Now the way I do it in my own practice, Mr. Chairman, If I have a specialty that I want to use, that I know is satisfactory, and will do the work, I will name that specialty, but I will also name at least two other specialties which will give comparatively the same service, then I will say "or equal." Then when I come to closing up with the contractor, I will say, "Which are you going to use?" I have never had a contractor refuse to give me what I wanted, because he has had his competition.

I don't believe in the blanket proposition of naming one specialty only and "or equal," that is, without any qualification clause. If you name two or three articles, any one of which will give you service, that will give your contractor an opportunity of securing competition, and will obviate the securing of this manifestly unbalanced bid that Mr. Brundage refers to from $13,000 to $3,000, and then when you actually close up you can always get what you want at the same price.

Mr. Arnold: May I say a word here? Mr. Davidson has exactly my idea in that respect, and the point I wanted to make when I proposed or suggested the idea of classification in our materials, and I don't think that the condition differs in other branches of the building industry, was that rather than specify we will say three, in the case of built-up roofs, all entirely different in character, that we decide first of all what particular type of material we want to use, then let anybody that may have those materials to supply bid on the work and eliminate all this guesswork. Why I have seen specifications in the case of roofing where a man might as well write, "Put a roof on the building," because the specification covered everything under the sun.

Secretary Coughlen: I want to say that I have had a letter from one of our members asking that same question and he apparently thought that we could give him the answer. He suggested that he has used two schemes both of which he found successful. One was that the specification shall be of such and such a type, definitely naming a certain specialty. The other one is to name three or four specialties and ask for separate figures on each one of those and give the contractor the opportunity of submitting figures on any similar specialty that he wanted to submit.

Mr. Davidson: I would also like to ask for the general reaction of the members here as to Mr. Brundage's suggestion that the average specification writer should be familiar enough with his work so as to keep out of his specification a requirement for so many alternative bids. A specification writer who follows that practice doesn't know his job, he has no business being a specification writer.

Mr. Woodyatt, (specification writer for D. H. Burnham & Co.): It may be the owner doesn't know which thing he wants, perhaps he would like to have a choice.

Mr. Davidson: My answer to that question would be this: If the owner hasn't enough confidence in his specification writer he had better get another one that he does have confidence in, because the specification writer, or architect, can tell the contractor the cost in these different items; he can tell him near enough so that the owner can make up his mind which he is going to use and then write his specification accordingly.

I would also like to say that I know Mr. Brundage's statement is absolutely correct when he says that if a specification definitely specifies a method for doing work and the contractor follows that, that he is relieved from any responsibility as to the success of that operation. That is a legal proposition that every specification writer ought to realize.

### Disease In Cathedral Glass

THE following item has once more started the rounds as a "filler" in the popular press. At least three years ago scientific men conversant with the facts published the truth but not all editors who clipped the item about the "mysterious disease" have read the denials.

WINDOWS RUINED BY DISEASE

York minster one of the most beautiful cathedrals of England, famous for its glorious stained glass, is in trouble. Some mysterious disease has attacked the stained glass. It takes the form of minute holes which in time deepen and cause the glass to flake. Some portions are as thin as tissue paper and crumble at the touch. No one knows a cure.

The disease is merely chemical deterioration. Some of the glass was made at the time when lime was used as a cheap substitute for soda and potash before it was known to be a valuable constituent, second only to silica. Some of the glass was made with inferior potash, some of it contained too much iron and some of it contained too much sand. Temperatures controlled today by pyrometers and thermometers were controlled a few centuries ago by the judgment of foremen trained in the school of experience.

Materials were not proportioned with scientific nicety and accuracy. A change of foremen in the factory supplying glass to York minster would change the quality of the material for a time. Even the best glass is slightly acted upon by alkaline solutions, by light, air and boiling water. That the glass supplied to York minster lasted without deterioration for several centuries, speaks well for the state of the art at that period. The cure is hermetically to seal the disintegrating panes between two thin sheets of good glass. Unfortunately but a small number of panes can be thus treated.

### Chaloner Foundation Art Prize Awarded

THE John Armstrong Chaloner Paris Prize Foundation recently awarded the first prize of $25 to Charles Costa while W. Stuart Leech and Louis J. Lucioni won second and third prizes of $15 and $10, respectively. H. Carlyle Leech and Alexander Geiss won first and second honorable mention. All are students of the National Academy of Design.

George de Forest Brush, W. L. Metcalf, Herbert Adams and Charles A. Platt comprised the jury.

### French Architects Plan to Build Under Elevated Railways

FRENCH architects have recently submitted to the Municipal Council of Paris a plan for relief of the housing problem which the newspapers claim "has more ingenuity than sentiment." It is proposed to fill in the spaces under the elevated railways with rows of houses. This has been successfully tried at Vincennes.

Projected design for a bank and office building in San Francisco, California

Willis Polk & Co., Architects

46a

CHOIR, CHURCH OF S. VITALE—RAVENNA, ITALY

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, JANUARY 18, 1922 NUMBER 2385

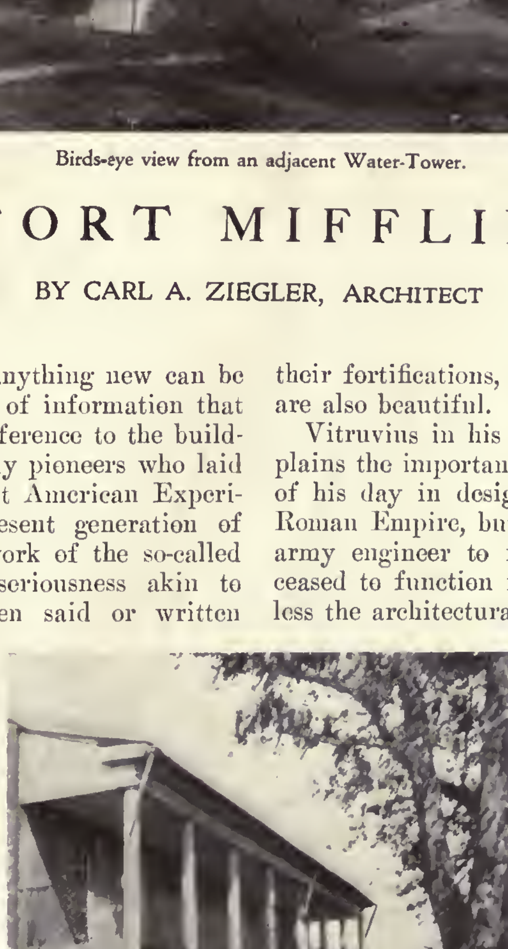

Birds-eye view from an adjacent Water-Tower.

# FORT MIFFLIN

BY CARL A. ZIEGLER, ARCHITECT

IT seems incredible that anything new can be added to the great mass of information that has been published in reference to the building achievements of the sturdy pioneers who laid the foundation for the "Great American Experiment" but although the present generation of architects has studied the work of the so-called "Colonial Period" with a seriousness akin to reverence, very little has been said or written about the early fortifications that were erected for the defense of the young Republic.

Although our forefathers were undoubtedly a devout and industrious people more inclined to the pursuits of peace than to the lure of military achievements, yet straight thinkers that they were, they added to the admonition to "Trust in God" the caution to "keep one's powder dry;" and in the same spirit with which they built their dwellings and churches and formed every utensil which they used, however humble, they built their fortifications, and these for the same reason are also beautiful.



"Quarters"

Vitruvius in his ten books on Architecture explains the important part played by the architects of his day in designing the fortifications of the Roman Empire, but one has only to interview an army engineer to realize that the architect has ceased to function in that field to-day; nevertheless the architectural student will miss much that is worthy of study if he fails to observe the few examples of early fortification work that still remain intact, not that he will gain any knowledge on the subject of defensive warfare, for even the army engineer has to admit the fact that the great war proved the utility of attempting to erect fortifications that would resist the assault of modern guns, but there is something whimsical about these old forts that seem to strut with the military spirit when we examine the yawing moat and sturdy walls and casemates, but which

This is all that stood between the British gun-boats and Philadelphia in 1812

appear so naive and complacent, when we see the simple little village which surrounds the parade within the walls, possessing all the charms of one of our Pennsylvania farmsteads with none of the militant spirit which we associate with the term "fortification."

One of the most interesting of these early military structures is Fort Mifflin which is situated on the Delaware River, just below the mouth of the Schuylkill River.

Were this interesting fortification situated near one of the larger cities of Europe no architectural student would think of visiting that city without including it in his itinerary, but although it lies only about six miles from the center of the city of Philadelphia, it is seldom visited by anyone and is practically unknown to the professors.

Maps of the City of Philadelphia published in 1750 fail to show any fort upon Mud Island which in the early days was entirely separated from the shore, although it is now fast and solid to the mainland.

A mud fort is supposed to have been the first defensive work erected upon this island, but in 1773 the Province of Pennsylvania began the erection of a more substantial fortification. It was in such a position as to command the channel of the river between it and Red Bank on the New Jersey shore and was known prior to the Revolution as Fort Mud.

During the Revolutionary War, Fort Mud offered a gallant resistance to the English; Colonel Samuel French of Maryland, with his band of irregulars, holding out against an overwhelming force until nine-tenths of its garrison were hors-de-combat.

General Washington was most anxious for the defense of Fort Mud and ordered Lt. Colonel Summer to reinforce it, but nevertheless, it was taken on the night of November 15, 1777, and Philadelphia was occupied by the British, who were guilty of wanton destruction of property after the evacuation of the fort, burning twenty-seven houses, including Jonathan Mifflin's mansion.

In 1793 the Legislature of Pennsylvania appropriated $5000.00 for the purpose of reconstructing the fort. A battery is said to have been erected upon the island by Mjr. Peter Charles L'Infant, who played such a large part in the designing of public improvements in the early days of the Republic. He it was who laid out the original plan for the City of Washington, D. C.

In 1795 the property was ceded to the state of Pennsylvania and thereafter was called Fort Mifflin in honor of General Thomas Mifflin, Governor of Pennsylvania.

Main gate to the Fort

Note slotted wall to the right from which troops in the vaulted casemates under the embankment could enfilade the enemy

Up until the year 1814 Fort Mifflin was the only defense which the City of Philadelphia possessed against an attack from the river.

During the War of 1812 there was great anxiety in Philadelphia because of a threatened attack by the British: Fort Mifflin could have resisted only very little, but fortunately the river froze over and the gunboats could not come

Officers' Quarters

Stone Houses and troops' quarters surrounding the Parade

FORT MIFFLIN, ON DELAWARE RIVER, PA.

up the Delaware to attack the City.

Fort Mifflin is not only a very interesting example of early fortification work but from the comprehensive group of buildings within the walls one can, with very little exercise of the imagination, picture a very interesting phase of the early life of the city.

It is unusual to find so large a group of early buildings in practically their original condition and with their original surroundings, but situated as they are, surrounded by the moat and wall and locked in by the heavy gates, these buildings have been undisturbed by the march of progress and to the student of art they still convey the realization that America did at one time possess an art sense that was adequately expressed in its architecture.

Interior view of main gate
The iron grating to the left leads to the casemates under the embankment

## "Road of Remembrance" Planned Across New York State

TWO thousand elm trees will be planted on the road between Syracuse and Utica early next spring as the possible beginning of a "Road of Remembrance," extending from New York City to Buffalo, as a tribute to New York soldiers who died in the World War.

Press reports announce that the College of Forestry of Syracuse University has pledged itself to the State Highway Commissioner and the State Forestry Superintendent to supply the trees for the first ten miles out of Syracuse.

In this connection a recent issue of the New York *Tribune* prints the following:

Of all the forms of war memorials none seems to have such a searching appeal as the "Road of Remembrance." In Great Britain the idea has taken hold of the public imagination, and the project of lining with trees the ancient roads of England, Scotland, Wales and some parts of Ireland is being carried on systematically. In the United States the Lincoln Highway Association is considering a transcontinental planting plan. In Louisiana a memorial tree is being set out every forty feet along the Jefferson Highway.

It was through some tree-lined road in France that every man who played a man's part had to march to keep tryst with his destiny. One among them was Joyce Kilmer, turning over in his mind, perhaps as he slogged along, his own tender thoughts of trees.

The Parade, Fort Mifflin
Practically unchanged, excepting for decay. With very little imagination one can picture the very interesting life that must have gone on in this enclosure during the early days

FIG. 1

# THE VALUE OF MODELS IN ARCHITECTURE

BY JEAN HETHERINGTON

Illustrated by photographs of models made by the author

THE last thirty years have seen a great impulse in the esthetic development of public and domestic architecture in the United States, and during that period as the education of the planner and the designer has advanced, his perception broadened and his work improved, so has the art of rendering in perspective been recognized more and more as an essential in the practice of architecture. This was felt perhaps, in the first place, as being helpful for the enlightenment and more easy comprehension of client, corporation or public body, as the case might be, who, responsible for the initiation of building problems and the providing of funds for the prosecuting of same, required visual portrayal of designer's solution. In the second place, and more important, the architect, on his own account has increasingly felt the urge towards better perception of the values of mass and shadow, of outline and projection, of approach and environment, and generally, of better mental grasp in his efforts towards higher levels.

FIG. 2

To these factors chiefly can be attributed the necessity for adequate pencil, ink and color rendering, which, keeping pace with quality in design, has now reached such stage of perfection that the exquisite work of Eggers, Long and many others is now accepted as the every day and matter of course.

While perspective drawings, therefore, must always remain in the highest degree indispensable, they are on occasion inadequate and at times possibly misleading in so far as they fail to produce on minds of those vitally concerned a full conception of the endeavor of the architect to translate the ideal into terms of walls, fenestration and roofs. Such drawings present but one view, and

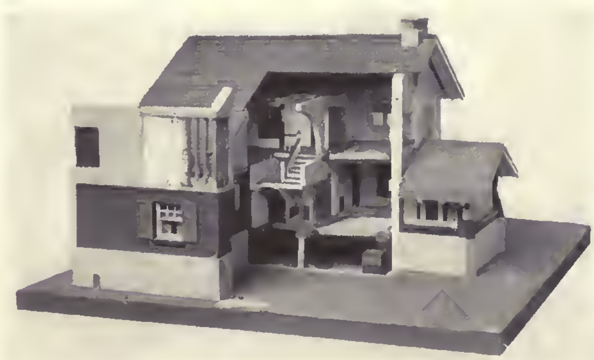


FIG. 3

that, naturally, the most favorable to the scheme contemplated in the mind of the designer. A façade, when depicted from one point, can be altogether noble and imposing, but may, when seen from another point, be disappointing in its relation to the alternative side of the same building. Or a grouping of walls, openings, chimneys and roofs when viewed from a certain distance and direction may be pleasing and satisfactory, and from another be only confusing and unbalanced.

To layman and professional both, therefore, the art of accurate scale model delineation should be welcomed as additional and more commensurate means towards clearer visualization. The Greek

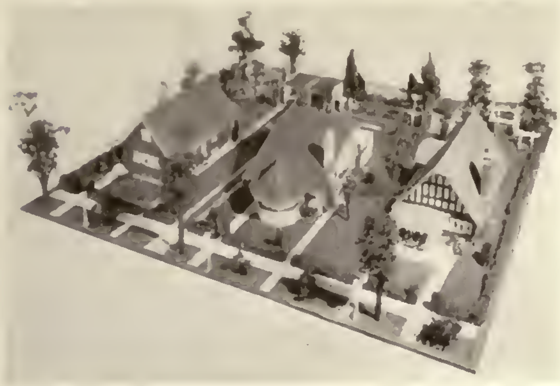


FIG. 4

and the Roman architect used this medium; later, Christopher Wren did so, and in the near past many models of the more pretentious buildings in this country and abroad have been produced. There are many methods of construction and representation, and the adoption of the different modes, materials and scales will be governed largely by the individual problem and by the wishes of the prospective owner. Being a replica of the completed building it should be to accurate scale and indicate as far as possible the actual details of same. The ordinary public building or street home, for instance, is that usually where immediate environments are of fixed character and limited scope. The country house, on the other hand, with its large spaces and existing topographical features, gives opportunity for study, not alone of the artistic elements but also of the economical development of the house in its relation to grounds, driveways, etc. In the well made model, accurate and complete in all details of stone and brick textures, window reveals and glass, roof eaves and its walks and shrubs, there is to the owner something peculiarly gratifying as he visualizes it, and especially if he does so at a distance, through the medium of a pair of opera glasses. He receives a vivid and realistic impression of the finished building altogether more complete and adequate than that mentally conveyed by mere line and color and is thereby enabled intelligently to appreciate, criticise or modify.

## Attacks Immoral Art

"FROM some plays one sees each season in New York one might infer that there was only one commandment, the seventh, and mankind knew but one pleasure, breaking it," Dr. Henry Van Dyke of Princeton University, said in the convention of the Department of Superintendence of the National Education Association. He said immoral art was the most evil influence in the world.

Art for art's sake is a plea for its degradation, asserted Dr. Van Dyke, and the divorcing of art and morals will leave the art world as ruined as "though it had been cursed with an Egyptian plague." Jazz music was characterized by the speaker as "invented by demons for the torture of imbeciles."

"Much of the nudity in art has done less harm than the language in which it is described," he remarked. "We must exclude deadly art as we would deadly weapons. But do not rely on law to make people virtuous. This must be a matter of spirit. What we need is more moral sense not subject to sleeping sickness and not more statutes."

The highest element in art, in Dr. Van Dyke's opinion, is the moral element, and the best things art produces are those which make people stronger as well as happier.

"Those who say poetry and painting are exempt from the moral law, that they only have to be beautiful, are mistaken.

"Good music is caused by and fosters high emotions. It is hard to have high thoughts to jazz. The glutton cannot sing of his inner thoughts or the miser of his gold and produce real music, but the patriot can sing of his country."

The importance of religious education and need for correlating it with secular education was expressed in the following resolution adopted today:

"In view of the dependence of democracy upon religion, and the attacks to which all churches and all democratic governments alike are being subjected by radicals and by the emissaries of nations now under radical control, it is the duty of all churches, irrespective of creed, to unite in an effort to make religious education more universal and efficient, to emphasize democratic elements in religious instruction with all elementary public school education helpful to religion. It is the duty of the public school authorities to emphasize all non-religious elements in instruction which tend to make religious instruction more intelligent."

# NOTES ON ILLUSTRATIONS

**House of Eugene Kienle, Esq., Great Neck, L. I.**

Wm. H. Gompert, *Architect*

Lewis & Valentine, *Landscape Architects*

"MANY GABLES" the house of Mr. Eugene Kienle is located on Manhasset Bay at Great Neck, L. I.

The name "Many Gables" is derived from the ensemble of its many gables which exceed in number the house made famous by Hawthorne.

The general lines of the buildings and the arrangement of the various wings, have been carefully studied to produce low rambling effects with abundant interesting shades and shadows.

The walls are constructed of red clinker bricks carefully selected so that while the predominating color is red, the surfaces have been mottled with dark blue, purple and black clinkers featured in the laying of the masonry. The appearance of the brick work has been further enhanced by the light cream colored bed and cross joints which are arranged in such a manner as to give the effect of an underlying plaid weaving, in wall surfaces.

The window frames and casings are painted a strong cream color. The leaders, barge boards, eaves and flashings are of copper, and have been treated so that they have a soft *vert antique* tone.

The roofs are covered with a heavy Tudor slate 1¼" in thickness at the eaves and laid 10" to the weather and graduated in thickness to ¼" at the ridges where the surfaces to the weather had been diminished to 3".

The slate is of variegated colors consisting of soft tones of purple, green, grey and blues.

The hips of all roofs have been built with a slight concave curvature and all valleys formed by the intersection of the various surfaces of the roof have been rounded and covered with slate.

The chimneys are built of the same kind of brick as the walls of the house and are topped with buff colored terra cotta chimney pots.

The floors of the entrance loggias are paved with a biscuit color faience tile with black and pewter colored faience tile borders.

The floors of the entrance loggias are paved are paved with heather brown tiles with black faience borders.

The floors throughout the principal rooms are of oak and stained and treated in imitation of teak wood. The trim throughout is of simple design, painted, enameled and glazed to match the wood work of the respective rooms.

The study is reached by rising two steps from the entrance hall and crossing the broad platform at the foot of the main stairs and has been decorated and furnished in Chinese effects.

The Living Room is carried out in early Italian Renaissance style as are also the furnishings all of which take their note from the antique imported Carrara marble mantel, whereas the Dining Room is of Jacobian style with the furniture of the Cromwellian period. The chambers are decorated in the Georgian, Queen Anne and Colonial periods.

The three principal chambers on the 2nd story each have a large sleeping porch adjoining, which have been carefully concealed in the exterior design so as not to present a detrimental motif as is frequently the case with sleeping porches.

The bath rooms have been paved with white herringbone tiling with black faience borders and the walls to a height of 7'0" have been tiled with white tile with a black glazed border near the top.

This house is heated by a vacuum steam heating system, with thermostatic control.

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**Alterations to South Congregational Church, Pittsfield, Mass.**

Harding & Seaver, *Architects*

BEFORE this alteration was made the recess was filled with an organ with black walnut case and high black walnut pulpit platform and a choir gallery. The photograph shows the divided organ, the console of which is behind the choir railing. The organ builder required high openings towards the auditorium which are covered by the grilles of wood, the use of which is not evident without some explanation. The church required the pulpit at one side and the reading desk at the other in order to accommodate the chorus choir in the seats facing the middle of the recess. The pews were simplified and made over from the cherry pews which were arranged on a slant and had no center aisle.

# DYNAMIC SYMMETRY

## BY ALBERT A. SOUTHWICK

*"The chief forms of beauty are order and symmetry and definiteness, which the mathematical sciences demonstrate in a special degree."*
Aristotle, *Metaphysica, b.xiii c.iii.*

Whatever one may wish to think of Dynamic Symmetry, it is a subject which should receive, and which will in any case demand thoughtful consideration. If its principles have the fundamental character that is claimed for them, no amount of opposition can more than delay its general acceptance. If on the other hand the claims made are based on defective or insufficient deductions from the facts, those interested would be glad to know it. Already there are many who believe that it is indispensable for their work, and if they are right, development may in a not very distant future produce results which can now be only vaguely imagined. It is not possible within the limits of a magazine article to more than indicate wherein Dynamic Symmetry differs from the symmetry in general use, but much of the criticism which is made of it is so evidently inspired by misapprehension of what it is and what it can do, that any explanation may be helpful.

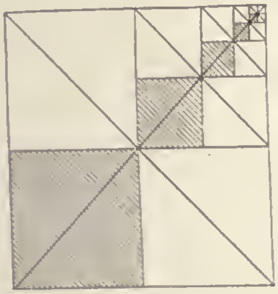


FIG. 1

The system presented by Mr. Hambidge bestows the power to construct form in such a way that all the elements have a clearly related ratio of proportion—more applicable, varied, and interesting than that with which we have been familiar. It had previously been possible to attain a perfect but monotonous symmetry by employing a design area which was a multiple of the unit chosen—a method which resulted naturally from working in linear dimensions. In that way the area could bo so divided that the units would just fill it with figures whose relationship could be determined. A square, or any rectangle consisting of a square, and an excess composed of even units of the square, can be divided to infinity by diagonals and diagonals of the resulting divisions with no other result than the production of squares, or parts divisible into squares.

The division by diagonals into terms of the parent form applies to any rectangle—the diagonals alone producing only constant repetition of the original. The use of a multiple of some selected unit was the basis of design from the beginning. It could be shown to be rational and correct, while the structure of everything else, at least since the Greek decadence, has rested on undetermined area division, or the still weaker foundation of individual taste, expressed without method.

This "static" arrangement is shown in a simple way in figures 1 and 2.

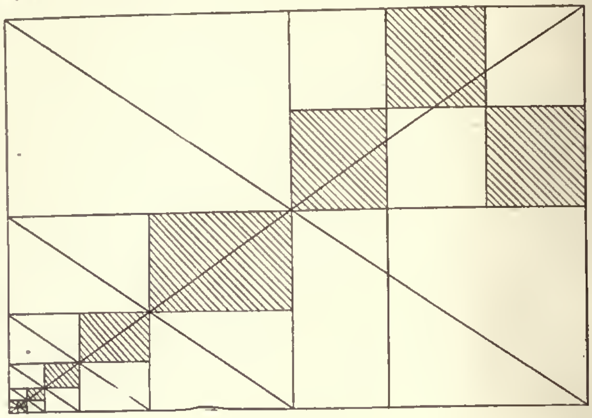


FIG. 2

1. Is a square divided by diagonals.
2. Is a rectangle containing a square and an excess composed of units of the square. The figure can be divided into squares, or into rectangles divisible into squares.

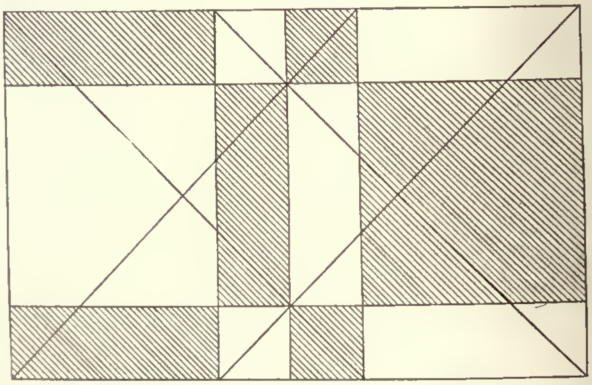


FIG. 3

A square and an excess of unknown value can, it is true, be divided into squares and rectangles, and the rectangles may or may not be like the original figure. A way to do this is shown in Fig. 3, but to determine the relation of the squares to the rectangles, and the relation of both to the whole is at least not easy. Fig. 3.

Our attention is now called by Mr. Hambidge to another method of area division. Figures 4 and 5.

If a rectangle whose sides are in extreme and mean ratio is placed within a square against one side, the square is completely filled with known elements, but they are of two kinds, a square, and rectangles alike in shape but differing in size, whose sides are in extreme and mean ratio. Certainly the interest of the space division is immensely increased by the introduction of rectangles which are understandably related to the squares. Both forms can be repeated to infinity by subdivision, but are not related in the monotonous 1-2-3-4-5 way. More than that, they are so related that the square on the end of any rectangle, is to the rectangle as 1 is to 1.6180+, the ratio of extreme and mean proportion. This figure has the same construction that is used in drawing Prop. XXX Book VI in Euclid's "Elements," which it seems has an everyday usefulness greater than had been supposed.

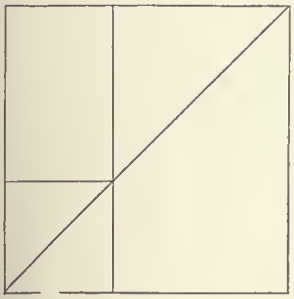


FIG. 4

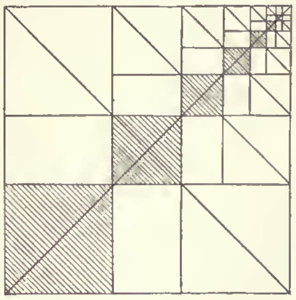


FIG. 5

Aside from the practical value of these rectangles due to their inherent quality of "measurableness," 1.6180+ and its related ratios are of the greatest interest. They seem to be the ratios of growth in plants, and if they can be shown to have a similar relation to animal forms, the inference would be justified that symmetrical arrangements of geometrical figures in these ratios are in close harmony with the laws of growth in nature.

By extending these areas into three dimensions, solids are obtained whose surfaces are obviously related.

Similar results can be obtained with rectangles whose sides are in the ratio of 1 to the square root of 5. These include the rectangle of extreme and mean ratio.

Rectangles whose sides are in the ratio of 1 to the square root of 2, and of 3 can be used in the same way, but they are apparently of less interest to the artist.

Above 1 to the square root of 5 the rectangles are so difficult to draw accurately, and are so complicated in combination, as to be seemingly of little use in practical work.

It is much too soon to arrive at fixed opinions concerning the application of this geometrical system, but three years of actual use enable one to understand something of its limitations, and of the advantage which may be gained from its use.

It may be said at once that no amount of Dynamic Symmetry will in itself create artistic forms. It is a tool, and one whose employment demands much thought and time. It is not sufficient, as some critics have supposed, to divide an area minutely, pick out haphazard a number of points, and draw a design to include them. To be of use the areas chosen must form a related series —one may almost say a rhythmical arrangement of parts.

The system intelligently used improves the artist's work by increasing the faculty for expression through the precision of science, brought to the aid of simple feeling for proportion, in other words by adding knowledge to intuition.

What dynamic symmetry does is to construct harmoniously proportioned and related rectangles, or rectangular parallelepipeds, which completely fill a rectangle, or a rectangular parallelepiped whose proportions accord with a geometrical scheme suited to the purpose.

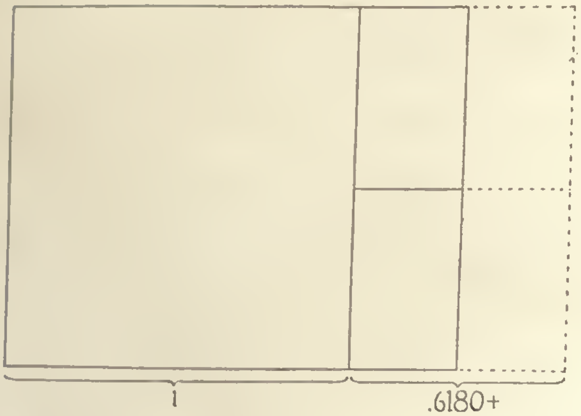
It is evident that a design whose dimensions coincide with areas or spaces that are related to one another, and which are in a similar way related to the figure which they form collectively, must have a certain precisely determined harmony, which cannot possibly be achieved by good taste alone, working without method.

Dividing the parent figure into smaller related figures, not only enables one to use related forms, but negatively all unrelated and consequently discordant forms are thus excluded.

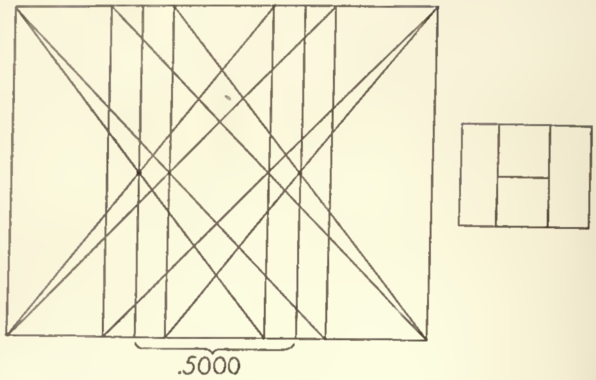
If anyone supposes that he can do these things by sense of proportion alone, let him draw a rectangle and then having covered it, try to draw another of the same proportions. The result will be likely to discourage any attempt to draw figures differing in size and form, but filling related areas by eye alone.

It is most improbable that a mind has ever existed, able without method, to plan a building from the ground to the roof, with all its forms based on a relationship of, say, one to the square root of five, with never a single form of discordant ratio creeping in. And yet buildings must be so planned if we are to have construction with the harmony of proportion, which has always been conceded to the Parthenon.

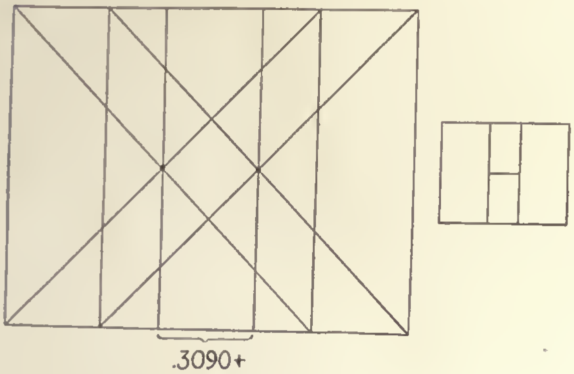
*In the following pages, Mr. Southwick explains in detail the design of a bowl, according to the Dynamic Theory. The drawings A to F indicate the progressive method employed, while G shows the line as governing the outline of the completed bowl.*—Editor.



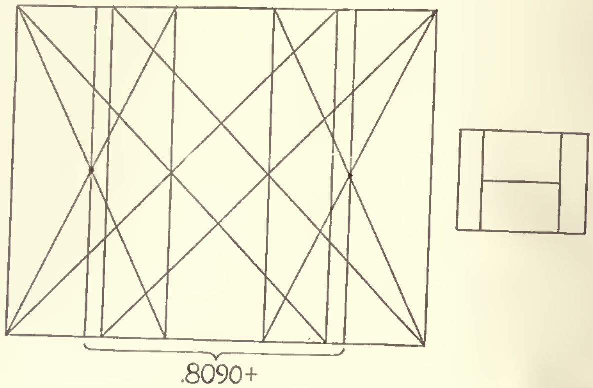

A



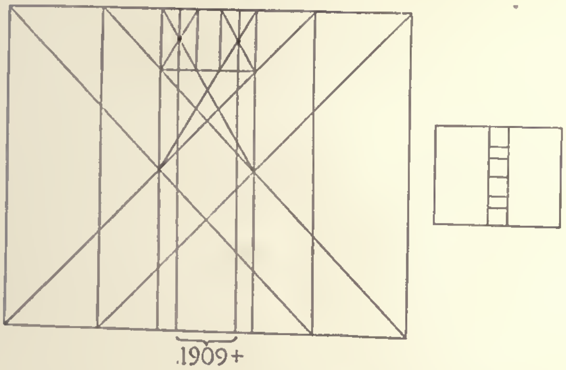

D



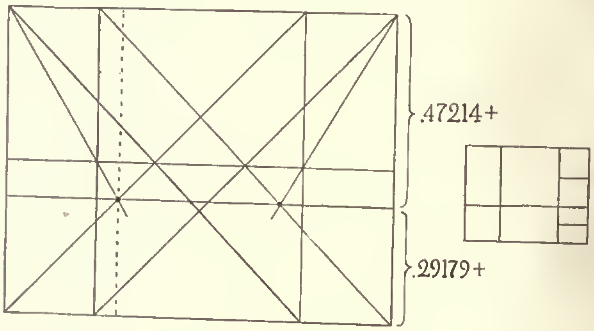

B



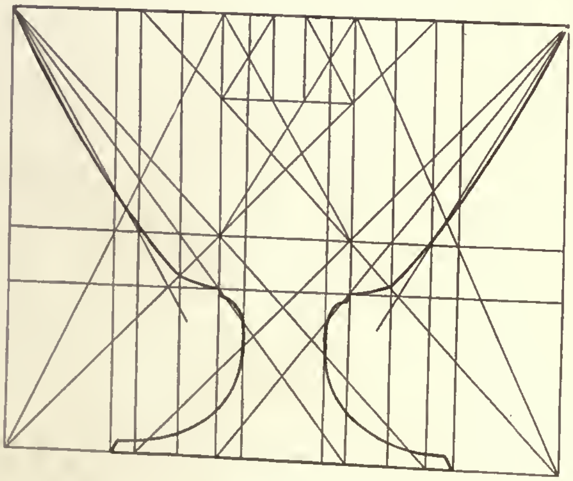

E




C




F



C

THE design on the foregoing page was made to show the extraordinary facility with which areas differing in proportion can be measured and co-ordinated.

The principal elements of the design form a sequence in extreme and mean ratio.

The width of the stem where it is narrow, is to the width where it joins the bowl as 1 is to 1.6180+ and the width at the bowl is to the width of the bowl at the angle as 1 is to 1.6180+. The width of the bowl at the angle has the same relation to the width of the foot, and this is true also of the width of the foot compared to the width of the bowl.

The Bowl

A. Is the containing rectangle. It is composed of a square and an excess which is .3090+ of the square. That is, a square, and half of a rectangle in extreme and mean ratio. The excess being equal, when divided, to two rectangles in extreme and mean ratio.

B. Has the two extreme and mean ratio rectangles transferred to the center of the containing rectangle.

C. Has a figure which is .1909+ of the square placed within the .3090+ figure. It consists of two squares, and four rectangles of extreme and mean ratio.

D. Has a figure which is .5000 of the square, or two squares, placed outside the .3090+ figure.

E. Has a figure which is .8090+ of the square placed outside the .5000 figure. It consists of two rectangles in extreme and mean ratio.

These areas are measured in thousands of a square on the short side of the containing rectangle. That is, their widths are measured in thousandths of their heights. Any one of them is 1.6180+ times the next smaller.

$$1.3090+ \div .8090+ = 1.6180+$$
$$.8090+ \div .5000 = 1.6180+$$
$$.5000 \div .3090+ = 1.6180+$$
$$.3090+ \div .1909+ = 1.6180+$$

F. Has the containing rectangle divided horizontally, forming two rectangles whose areas are in extreme and mean ratio. This is indicated by an extreme and mean ratio rectangle in the end of the area containing the bowl, and a square of the same width in the end of the area containing the foot.

The upper area consists of a rectangle of extreme and mean ratio, a square and two squares.

The lower consists of a square, a rectangle of extreme and mean ratio and two rectangles of extreme and mean ratio.

These areas are .47214+ and .29179+ of a square on the long side of the containing rectangle. That is, their widths are measured in thousandths of their lengths.

$$.47214+ \div .29179+ = 1.6180+$$

The component areas of the design form a monotonous, regularly ascending scale, which has been chosen for the reason that the relationship is more evident than it would be in a varied composition.

Whatever may be the merit from an aesthetic point of view of the particular bowl made in these proportions, it is certain that there is a definite harmony in its dimensions which can hardly be otherwise than helpful to the design.

# *The Roman Catholic Cathedral, Baltimore, Md.*

*(See reproduction of original drawing by Otto R. Eggers on opposite page).*

*THE Roman Catholic Cathedral in Baltimore, Md., was until the death of Cardinal Gibbons, the first Catholic diocese in the United States. In this Cathedral was held among other notable gatherings, the Third Plenary Council. The Cathedral was built in the early part of the nineteenth century and is remarkable for the fine simplicity of its design and the good proportions of its parts. Mr. Eggers has happily chosen a point of view that shows these marked characteristics in a most artistic manner.*

*The architectural excellence that marks this edifice can also be found in many contemporaneous churches built along the Atlantic Seaboard. No better examples of our early American architecture can anywhere be found.*

THE CATHEDRAL, BALTIMORE, MD.

*THE AMERICAN ARCHITECT Series of Early American Architecture*

58c

# ·EDITORIAL·COMMENT·

### Taller Buildings for London

THE question of higher buildings for London is being debated in the English architectural and engineering societies. The London architectural journals are giving considerable space to this matter of changing London's skyline. Under a scheme now formulating, permission will be asked to erect buildings to a height of 120 feet, or where streets face parks or the river, to an extreme of 150 feet. The present London building act limits the heights of buildings to 80 feet above the street level. This restriction, it is claimed, prevents the expansion demanded by the increasing trade of the large West End and other London stores.

It is, of course, interesting to learn the attitude of the organized architectural profession towards so radical a change. As would be supposed, our conservative brethren across the water are moving with considerable caution, a caution which amounts to slowness that may eventually cause them to be left outside the argument. While this attitude of caution has some things to recommend it, possibly it may be carried to a point that will mean stubborn dissent to a forward movement, the very impetus of which may not be successfully resisted. While a committee of the R. I. B. A. has pronounced in favor of the movement, Mr. Paul Waterhouse, the president, in a statement printed in the London *Times,* directs attention to the fact that there also has been presented a minority report strongly disagreeing.

As the Council of the R. I. B. A. has failed to take any definite stand in the matter, it is premature to state that the Institute is favorably disposed towards the proposed extension of heights.

The Society of Architects, on the other hand, if we are to assume the views of its secretary as representative of its joint opinion, seems to regard the present restriction of 80 feet as an antiquated regulation, and is all for a higher skyline and more modern methods.

EVERY New Yorker who can visualize his city before the day of tall buildings, will recall the many protests that crowded the editorial pages of daily papers when the tall steel frames of projected buildings went skyward. The effect of these tall structures standing alone in a neighborhood of older and lower buildings was something that every one then believed was to ruin the effect of this city.

As methods of construction became perfected, and as solid character of the foundation of Manhattan Island became better known, the tall building appeared in rapidly increasing numbers until lower Manhattan Island, as it greets the stranger who enters our harbor, is one of the wonders of the world. Its splendid massing and picturesqueness cannot be questioned.

Later, when it was seen that the indiscriminate placing of tall buildings was working harm to certain previously well restricted localities, this city enacted a well considered zoning law. The whole scheme is daily working out to good advantage. New York's tall buildings, with their "step backs" are no longer regarded as encroachments for they may not now encroach.

What New York has accomplished and what other cities in this country are doing in following New York's example may be accomplished in London.

It was a firm of American architects that erected the first tall building in London. That structure is becoming a well liked landmark. If all the other tall buildings that will undoubtedly be reared in London are as artistically conceived, even the most conservative Londoner will have nothing to regret.

DESIRING to get an expression of opinion on this matter of higher buildings for London that would be authoritative, we sought and obtained an interview with Mr. Harvey Wiley Corbett, of the architectural firm of Helmle and Corbett, the architects of the Bush Building in London, recently illustrated in this journal. Mr. Corbett, during the course of this interview, said substantially as follows:—

"The London Building Act permits building to go a vertical height of 80 feet on the street front and an additional two stories back of a sloping Mansard roof. This makes possible an eight or nine story structure. Now, why does London want higher buildings?

"There are only three reasons why any city wants higher buildings. First, property owners with particularly favored terrains, desire a greater income on their land than the existing laws enable them to secure. Second, more space needed for business than can be built under the present restrictions, and, third, greater architectural variety in the skyline.

"The first is, of course, the most important reason, and up to the present time, the only one that has resulted in high buildings in any city.

"A general and erroneous impression is that New York has high buildings because it is located on a narrow Island and with no room to expand laterally, was compelled to push up vertically. The observer has but to walk only a few blocks East or West from Broadway or Fifth Avenue, on any part of their entire length, to become convinced that there was no lack of any room for lateral expansion.

"A similar scrutiny of London with its three and four story buildings, even in the busiest business centers, will result in the conviction that existing laws will permit the erection of nine story buildings where the present four story structures now stand. Here is the answer to the question 'Why does London want higher buildings?'

"I said there were but three reasons for high buildings. We have disposed of the first and second. The third has a popular appeal, which is the question of greater architectural variety in the skyline. Can it be possible that New York has so set the fashion in this respect that even the conservative Britisher wants his London to be like New York? The thought is not believable.

"Looking at the problem from another angle, we must take into consideration the fact that London is built on clay. High buildings, as we in this country know them, the Woolworth, the Metropolitan Tower, the Bush Building, would be structurally impossible in London. Of course, a height of 150 feet could be realized, but this would not produce a brilliant, scintillating skyline such as we have here, but would only result in creating darkened streets, increasing congestion in already overcrowded thoroughfares, and would make London, now unique among the cities of the world for its impression of openness and air, its flowers and green spots at every turn, and its quaint, old-fashioned atmosphere, as commonplace and commercial as any of our own American cities. I am confident no architect would want to see such a change, and so far as I am aware, nothing has occurred to make such a change possible. Certain variations from the London Building Act are now possible for the creation of good architectural effect. Towers, domes, gables may extend a moderate height beyond the height fixed by law, but London can be just as practical a city, just as commercial a city and certainly a healthier, brighter and more distinctive city with her present Building Act in force as it is.

"Why, in the name of all that is reasonable, must London start and do the very thing New York is trying to stop doing? We have gone so far here, we may never get back. Why, then, start London on a similar downward (or should I say upward) path? This is one case where I hope with all my heart that the conventional British point of view of 'letting well enough alone' will prevail."

## The Washington State Architect

THE first issue,—under the editorial direction of Eaton H. Edgerton,—of *The Washington State Architect,* the official organ of the Washington State Society of Architects, has been received. It indicates that it represents a most wide-awake and efficiently working organization, and presents a further good example of what may be accomplished when a State Society is properly organized and where its members are alive to the duties of their profession.

R. Hamilton Rowe, president of the Society, contributes the leading article. In it he states:—

"The Washington State Society of Architects is about to enter a new year of its existence and I believe that now is an opportune time to acquaint the members of the architectural profession, who are not affiliated with this organization, and also the general public, with its hopes, aims and aspirations, that brought about its being and which will continue to be its controlling influence.

"Architects of the State of Washington had long realized a need of an unhampered local state body; a body so organized as to permit a close co-operation of its members in upholding the high standard of architectural practice.

"They recognize The American Institute of Architects as performing this function nationally, but also they felt as our forefathers did when they framed the Constitution of the United States of America; that a national body did not and could not localize itself without detriment to its national functions, as we do not obtain our highest ideals by the practice of architecture alone but by maintaining our responsibility to the community and the state in which we live and labor."

It seems to us that the foregoing statement presents the main reason why a State Society has right to existence. That a national body cannot localize itself without impairment of its national functions is exactly true. Good citizenship is not alone the strict adherence to our national duty. We approach the nearest to our highest ideals, when we equally maintain our responsibilities to our state and community.

No well wisher of the profession of architecture would willingly agree to any impairment of the dignities of the Institute. But those dignities are purely national, and where they relate to the local administration of matters architectural, this journal has long been in favor of State Societies and for that reason it has also long advocated their organization in every state. Such organization, while not necessitating the disbandment of chapters, should logically work in that direction. Many believe that the nationalization of the Institute would be best secured by working through State Societies and this belief is the logical result of a series of years' existence of State Societies. These societies, wherever they have been organized, have proved their right to existence and their large constructive value to the profession in their various states.



AEROPLANE VIEW—SHOWING (UPPER BUILDING) THE COMPLETED "QUADRANGLE"—A GROUP OF DORMITORIES FOR WELLESLEY COLLEGE STARTED IN 1903, AND JUST COMPLETED BY THE ADDITION OF A CONNECTING LINK ACROSS THE FRONT OF GROUP

J. A. SCHWEINFURTH, ARCHITECT OF THE "QUADRANGLE"

60

ADDITIONS TO DORMITORY GROUP, WELLESLEY COLLEGE, WELLESLEY, MASS.

J. A. SCHWEINFURTH, ARCHITECT

THE connecting link between Cazenove Hall on the left and Pomeroy Hall on the right of "The Quadrangle," recently finished, completes this group of dormitories for Wellesley College. The first one of the group of four buildings was started in 1903, the donor of this building stipulating that the building should be in the Elizabethan style, fixed the style of the whole group. Housed here are about four hundred students, with various recreation rooms or parlours, and a dining room, kitchen, serving room, etc., in each separate building, and suites for visiting guests, rooms for servants and janitors, and for members of the Faculty, together with the usual toilet accommodations. The material used is red waterstruck brick and Indiana limestone, with green slate roofs. The copper roofs of the tourelles of each of the four main towers of the group, and the lantern over the tower of the center of the connecting link, have turned a light greenish copper blue. A photographic view from an airplane gives a general view of the group.

60c

ADDITIONS TO DORMITORY GROUP, WELLESLEY COLLEGE, WELLESLEY, MASS.

J. A. SCHWEINFURTH, ARCHITECT

$60^{4}$

ADDITIONS TO DORMITORY GROUP, WELLESLEY COLLEGE, WELLESLEY, MASS.

J. A. SCHWEINFURTH, ARCHITECT

VIEW IN LOGGIA, SHOWING SHAFFER HALL IN DISTANCE

60

NORTH WOODWARD HIGH SCHOOL, DETROIT, MICH.

MALCOMSON, HIGGINBOTHAM & PALMER, ARCHITECTS

60 6

NORTH WOODWARD HIGH SCHOOL, DETROIT, MICH.

MALCOMSON, HIGGINBOTHAM & PALMER, ARCHITECTS

60 7

NORTH WOODWARD HIGH SCHOOL, DETROIT, MICH.

MALCOMSON, HIGGINBOTHAM & PALMER, ARCHITECTS

60

AN ENTRANCE DETAIL

NORTH WOODWARD HIGH SCHOOL, DETROIT, MICH.

MALCOMSON, HIGGINBOTHAM & PALMER, ARCHITECTS

60 9

HOUSE OF PHILIP W. HENRY, ESQ., SCARBORO, N. Y.

BERTRAM G. GOODHUE, ARCHITECT

60'0

INTERIOR VIEW

HOUSE OF PHILIP W. HENRY, ESQ., SCARBORO, N. Y.

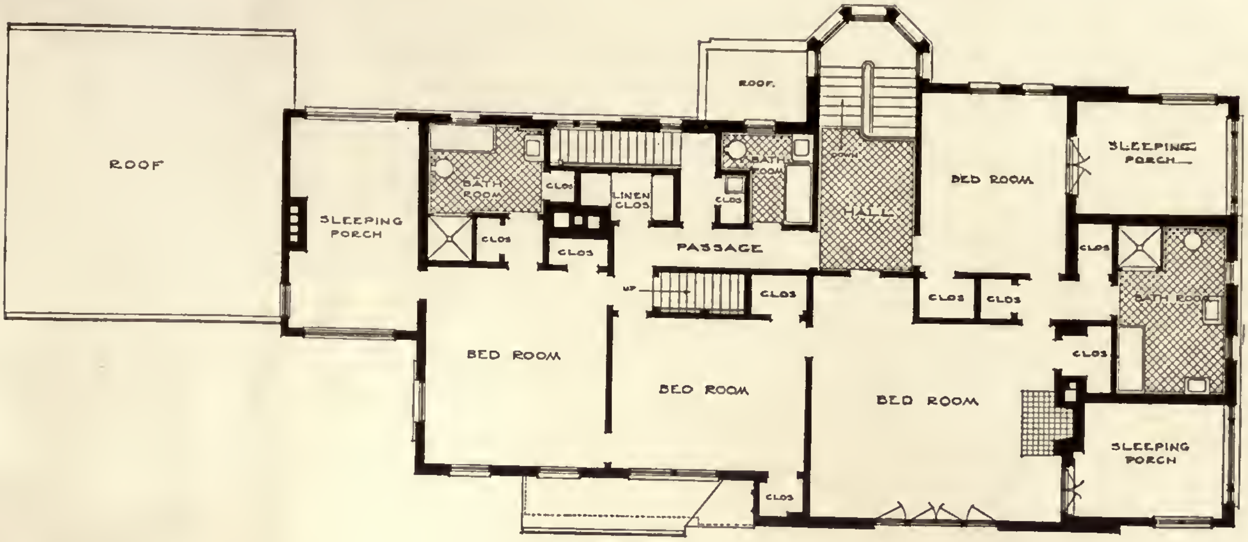
BERTRAM G. GOODHUE, ARCHITECT

60"

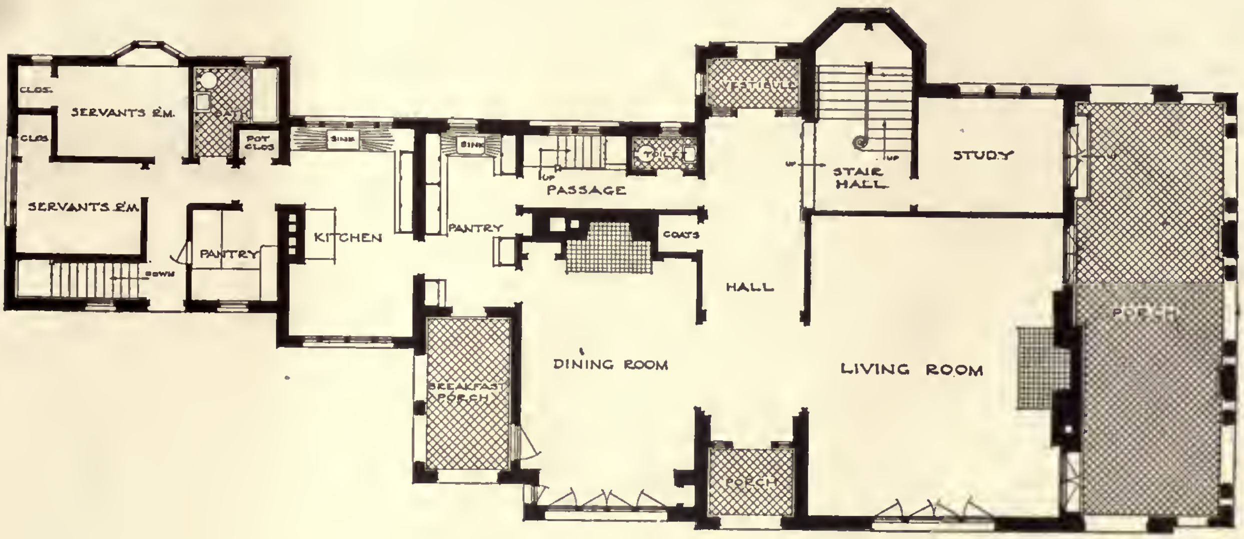
HOUSE OF EUGENE KIENLE, ESQ., GREAT NECK, L. I., N. Y.

WM. H. GOMPERT, ARCHITECT

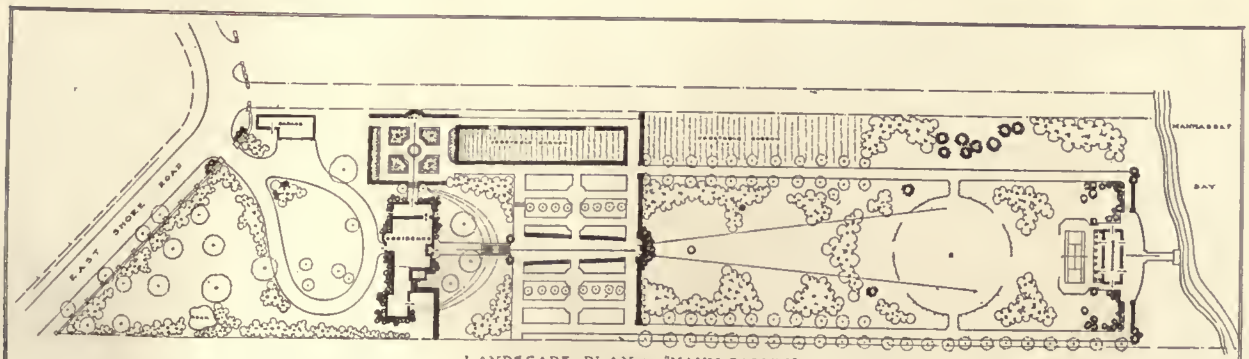
60-e




SECOND FLOOR PLAN




FIRST FLOOR PLAN




LANDSCAPE PLAN OF "MANY GABLES"

HOUSE OF EUGENE KIENLE, ESQ., GREAT NECK, L. I., N. Y.

WM. H. GOMPERT, ARCHITECT

60 13

HOUSE AND GARAGE OF EUGENE KIENLE, ESQ., GREAT NECK, L. I., N. Y.

WM. H. GOMPERT, ARCHITECT

60 14

HOUSE OF EUGENE KIENLE, ESQ., GREAT NECK, L. I., N. Y.

WM. H. GOMPERT, ARCHITECT

60 15

DETAIL, MAIN ENTRANCE, WOMAN'S ART BUILDING, INDIANAPOLIS, IND.
CHARLES W. NICOL, ARCHITECT

6016

# EXHIBITION OF AMERICAN ARCHITECTURE IN LONDON

THE Exhibition of American architecture in the galleries of the Royal Institute of British Architects was formally opened by Lady Astor, on November 23, 1921. We learn from *The Architect's Journal,* that the keenest interest was displayed, and that among those present were Mr. Bertram G. Goodhue and Mr. Donn Barber.

*The Architect's Journal,* in a long and highly appreciative review of the exhibition states in part as follows:

Not only is this exhibition varied and comprehensive, it is also invested with a thoughtful significance, for it illustrates not merely the ultra-modern aspect of American architecture, but also its equally interesting evolution from the more sedate examples of the Mission style period.

As architects, we might wish for more plans and sections; but it is not a serious defect, the photographs which make up the bulk of the exhibition fulfilling their task uncommonly well. And here let me praise the excellence of most of these photos, not only on the specific ground of adequate presentation, but of artistic consummation as well. What could better convey the great qualities of scholarly forethought, of grandeur latent in so many American buildings, than the photos of the vestibule to the General Post Office, New York, by Welles Bosworth, or the two really fine prints showing respectively John Russell Pope's Scottish Rite Temple taken by night, or his Leeds Mausoleum? These are indeed beautiful, and it is not so moot or trivial a point as not to be worthy of a distinct acknowledgement, because the sooner English architects realize not so much the obvious advantage of having faithful records of their works in the guise of photographs, but that such photographs should be taken by a man blessed with especial selective powers as well as technical skill, the better for them.

The exhibits are grouped under individual headings, as it were, and the system works clearly. Delano and Aldrich in "Residence of Bertram Work, Oyster Bay," show their power of restraint and their fond love of refinements. The façade is simple, the details and surroundings have been profoundly studied, and the result is a lasting success. The "Façade to the Winthrop House" is another instance of identical qualities yielding identical results. Both these elevations are gems of domestic architecture. The singular Louis Sullivan is represented by the now familiar exterior of the National Farmers' Bank, Owatonna. The "Water Garden Pavilion" of Arthur Heim, with its long, rectangular pond well backed by the pavilion, is worthy of notice; the three open bays, capped with their low-pitched roof of tremendous overhang, make an immediate appeal, which is partly due to the corner treatment of double piers and to the fanciful decoration of the bays.

The "Institute of Technology," by Welles Bosworth will repay close scrutiny, especially the vestibule. Observe the able distribution of its gigantic Doric columns, the frieze over the doorways—which frieze, by its mere introduction, adds a secondary rhythm of great charm—the elaborate coffering and beam treatment. When so convincingly carried out, there is much to be said for this almost unmitigated use of antique formulæ, for here it is made in the full enjoyment of much sure knowledge, and in no way does it ever traverse structural requirements.

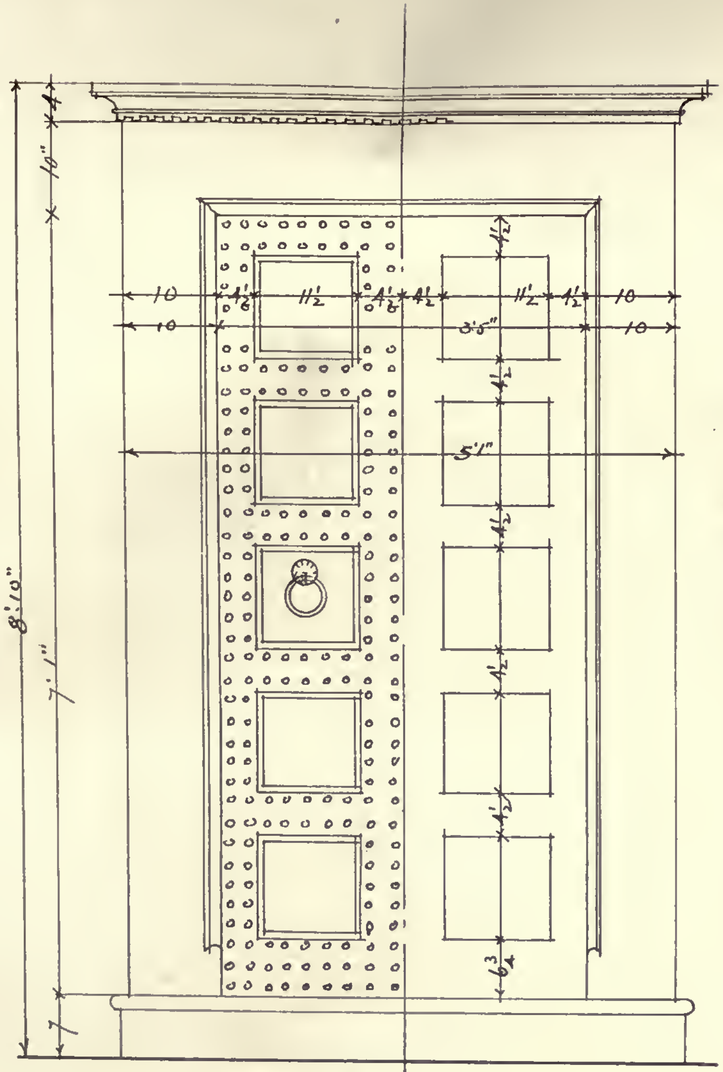
The next architects are prolific exhibitors. No fewer than twenty photos and drawings give us further instances—if such are necessary—of the great accomplishments of McKim, Mead, and White. Beside such landmarks as the Pennsylvania Railway Station, or the Pierpont Morgan Library, N. Y., there are others which, if less known to European critics and admirers, are notable efforts. "Houses for Geraldyn Redmond and Countess De Langier-Villars, N. Y.," is a case in point. Greater effectiveness shall seldom be achieved; the handsome and huge roof, broken by substantial chimney-stacks, and with its clever arrangement of dormers, the whole surmounting a plain ashlar façade of noble proportions, of which not the least interest centres in the excellent fenestration, or the elevation of the "Century Club, N. Y.," in a pencil, pen-and-ink, and wash drawing of much charm.

An eminent architect once gave it as his considered opinion that more than anybody else John Russell Pope is being looked up to by the younger bloods of America, and it is not difficult to see many reasons for this in the few, but for all that the extremely significant, photographs which display the scope of his genius. The "Scottish Rite Temple" may or may not be the best choice, but if it isn't, then the blame for picking up the wrong plum must be laid at the door of the photographer or of the artist responsible for the beautiful perspective drawing. The photos have been seen before in our professional periodicals, but it is nevertheless a pleasure to see them again, especially as the exterior of this temple is illustrated by the photo taken in daytime and another taken at night from the very same point of view. And this last one it is which brings in its trail many suggestions of indubitable possibilities, inasmuch as it actually throws light on a fascinating side of architectural effect—that of artificial lighting. This effect, very obviously, can only be dealt with in a set article, but it is enough to say that this photograph adumbrates in a most pregnant way great possibilities. This "Scottish Rite Temple," as seen by night, is truly invested with a fantastical touch, with a quickened sense of ethereal vitality which it must surely lack in the more searching and prosaic light of day.

That American architects are not insensible to this powerful aid of artificial lighting is made apparent whenever they have to bring into being an international exhibition. Both the St. Louis and the Pan-American Exhibitions were made far more alluring by this frank and insistent use of it, and a recent striking drawing by Ferris (I believe) of a 1,000 ft. tower to some semi-ecclesiastical building by Cram and Goodhue fired the imagination the more easily by the artist's handling of dramatic effects so obtained. But John Russell Pope's more architectural power is best illustrated in a photo which shows the entrance to the Leeds Mausoleum. Probably it is a building of such obvious artistic value that so attracts the younger architects by the sparing use of mouldings, the originality of its frieze of wreaths taking the place of triglyphs and yet retaining the usual "guttæ" under the fillet, by the exceptionally fine low-relief carving over the doorway, with the entire building made to surrender its almost majestic loveliness by so chaste a glomeration of details being embodied and held in so virile an expanse of otherwise unadorned stonework.

An exotic fountain to one of the patios that act as refreshing focci to the Pan-American Exhibition is indeed pleasant. But one still misses the intractable charm of Paul Cret's drawings of it, as they were published a few years ago. Stress has been laid on the scholarly refinement of so many eminent American architects. It shall be carried further, for Carrère and Hastings are naturally expected to show definite signs of it, and they, in fact, do so in "An Art Gallery for T. Ryan, N. Y.," with a bold use of sgraffito in the open loggia of the first floor. Whatever slight weaknesses are revealed in the treatment of pilasters or spandrels are more than counter-balanced by the masterly ground floor. The farther gallery has as much interesting material in store. If "Allen House," by Charles Berg, betray too conscious a partiality for heterogeneous materials, this fault of overdoing the "texture stunt" cannot be levelled at Mellor, Meigs, and Howe, in the photos they show of the "Residence of George Howe." Here, one is face to face with an exceptionally firm appreciation of stonework as applied to a domestic building of a more luxurious character; the incorporation of brick in it being especially happy and discreet, and it does not rob the balcony and pond below of our full meed of admiration for an exceptional piece of design.

Well, such a kaleidoscopic review of so many photographs—there are over 300—sooner or later jades the nerves. I cannot suggest a better way of titilating them once more than by advising the onlooker to bring his attention to bear on some of the drawings and rendered perspectives. There is, already alluded to, an "Institute of Technology;" this handsome monochrome drawing, some 5 ft. by 4 ft. 6 in., is a fine formal "rendu" in the French manner. And there are two other remarkable drawings; one, of the "Scottish Rite Temple" is extraordinary effective. Drawn and colored on grey paper, it exhibits very few tricks, and throws much credit on that consummate architectural artist, O. R. Eggers. As to "General View of Panama—California Exposition," beside being the largest drawing on view, being at least 6 ft. long, it unmistakably betrays the influence Charles Guérin had, and probably still has, on his lesser satellites. This is not merely a vast exercise in tree rendering, or in luminosity, but a coherent and solid contribution to architectural rendering, and whosoever is afflicted with the strange malady of wanting to—or having to—render ambitious drawings should have a sustained look at it, gloss over its few defects and dwell at length upon its brilliant qualities, not because it is a Guérin (probably it isn't), but because it does not overdwarf the architectural buildings, but frames them in a grand, sumptuous and satisfying manner.




· ¾" · ELEVATION ·

## Door at the Head of the Stairs Cloister of San Lorenzo, Florence, Italy

THE cloisters of San Lorenzo, which are attributed to Filippo Brunelleschi and were built about 1425, contain many doorways of a type found frequently in Florence. This type, of which this door is an example, is at the head of the stairway between the two levels of the cloister. It has a simple flat architrave with a round corner and a cornice composed of a half round and a dentil course.

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MEASURED AND DRAWN BY ROBERT M. BLACKALL

THIRTY-FIFTH HOLDER OF ROTCH TRAVELING SCHOLARSHIP

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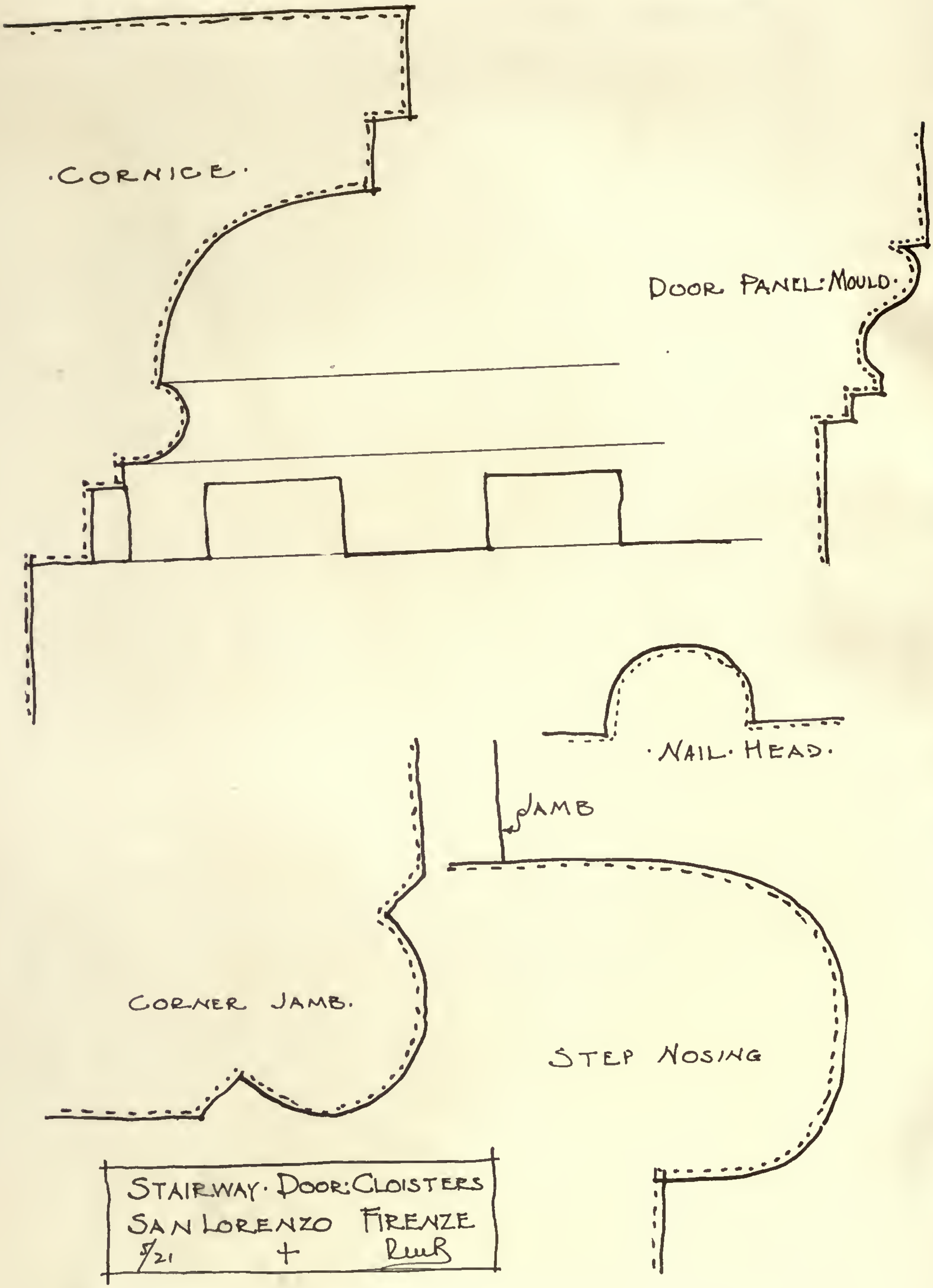
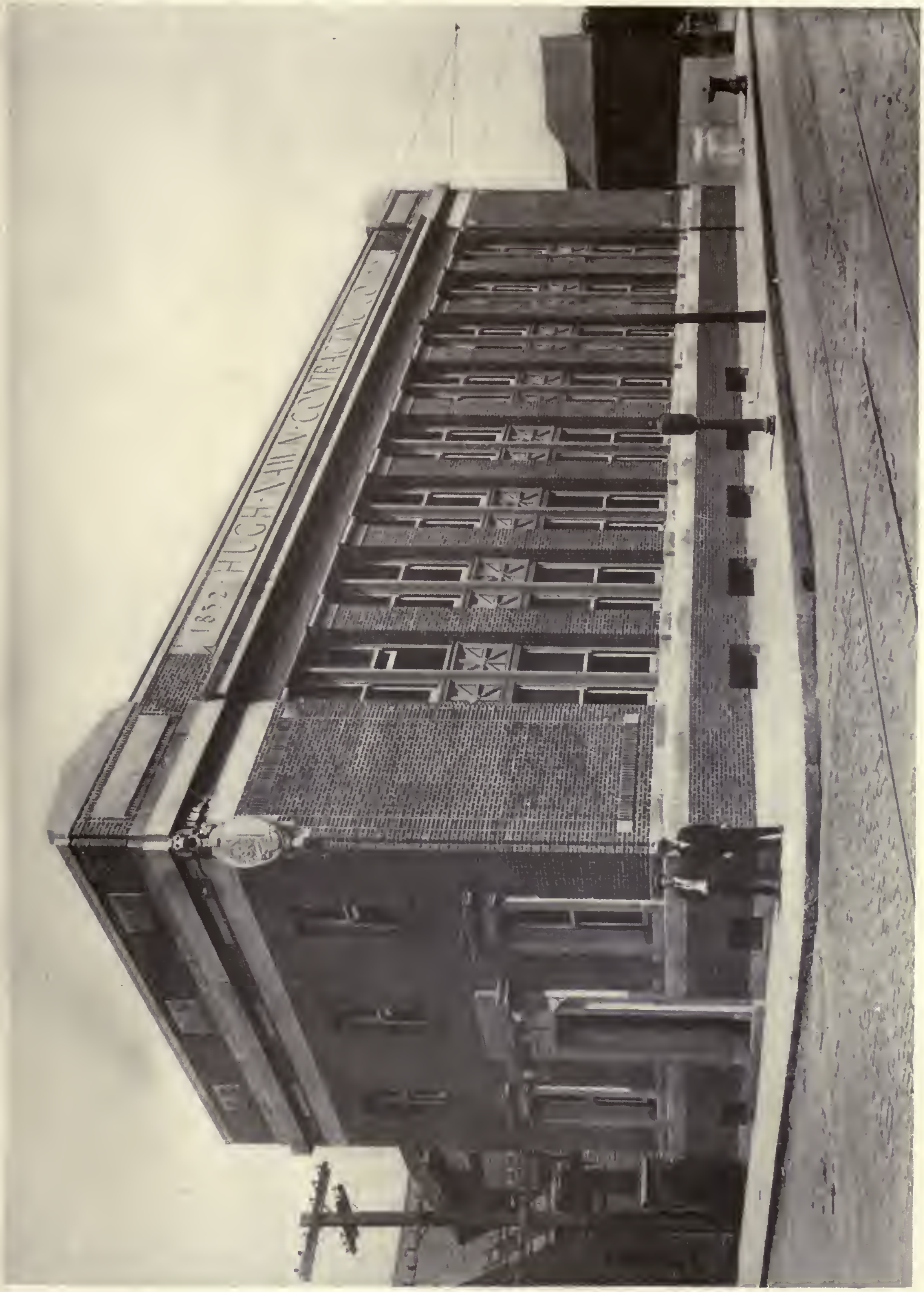
*THE AMERICAN ARCHITECT SERIES II. FRENCH & ITALIAN DETAILS*




MEASURED AND DRAWN BY ROBERT M. BLACKALL, 35TH HOLDER OF ROTCH TRAVELING SCHOLARSHIP




HUGH NAWN CONTRACTING CO. BUILDING, BOSTON, MASS.

J. A. SCHWEINFURTH, ARCHITECT

ENTRANCE DETAIL
HUGH NAWN CONTRACTING CO. BUILDING, BOSTON, MASS.
J. A. SCHWEINFURTH, ARCHITECT

TERRE HAUTE COUNTRY CLUB HOUSE, ALLENDALE, TERRE HAUTE, IND.

JOHNSON, MILLER & MILLER, ARCHITECTS

ALTERATIONS TO SOUTH CONGREGATIONAL CHURCH, PITTSFIELD, MASS.
HARDING & SEAVER, ARCHITECTS

HOUSE OF MARSHALL HAYWOOD, ESQ., LAFAYETTE, IND.
CHARLES W. NICOL, ARCHITECT

# DEPARTMENT OF SPECIFICATIONS

Foundations (*Continued*)
Caissons

As in the case of other types of foundations one of the preliminary matters requiring attention when writing specifications for caisson foundations is the nature of the soil. Accurate information regarding this item should be given in the specifications as it very greatly concerns the method of operation and, in consequence, the cost of the work.

There are two types of caisson foundations in use. One type is the pneumatic caisson, which is used in the placing of foundations in or below the water level and where quick-sand or water-bearing soil is present. The second type is what has been termed the open well or "Chicago" type, for which dry wells are dug and then filled with concrete. The open well type of caissons will be discussed first.

The design of open well caisson foundations will determine the location, diameter, amount of reinforcement required and, to some extent, the depth required. It also will determine the number of bells that will be required.

All center lines and elevations of caisson tops should be laid out by a competent surveyor when excavation is started, the centers should be checked after the first set of lagging is placed, the elevations of bottom of wells and of all intermediate bells should be checked when excavation work is completed and the elevation of top of caisson should be checked when concreting approaches within two feet of the top. The specifications cannot be too rigorous in the matter of survey and checking of elevations and centers as errors have been known to occur even where the checking of measurements was thought to have been done carefully.

If caissons are to be paid for by the cubic yard of concrete placed—and this is the more usual method of payment, for it is hard to determine the correct elevations of bottoms of all caissons before excavations are made—the correct elevations are, of course, necessary for the computation of quantities. At times negligence has permitted the concreting of caissons above the proper top level and aside from the expense of removing the excess concrete, the delay and annoyance caused by such an error should not be allowed to occur.

Since the drawings will fix the diameter of caissons, the specifications need only state that all diameters must be the diameter inside of the lagging. The top of caissons should be brought to a level one inch below the bottom of the column base or the steel grillage under the base.

Caissons must extend down to firm soil of the desired character. Boring explorations will have determined the probable depths of the soil having desired bearing power and the specifications will require that caissons extend to depth approved by the architect, as more fully discussed later.

Lagging must be formed out of sound lumber, should be either two inches or three inches thick, not over six inches wide and with sides parallel and beveled to radius line. The ends of lagging should be cut at right angles to sides. Lagging should not exceed five feet in length and shorter lengths must be provided for soils that are of such a loose character that will not permit unrestrained sides of that height.

The rings for holding the lagging in position must be heavy steel bars and since they must be set in place after lagging is installed, they must be formed in two perfect half-circles, with ends flanged and punched for bolts. For size of the rings the specifications need only require that the cross-sectional area be sufficient for resistance of the soil pressure.

For well excavation in soils of a porous nature, especially where such soils overlay a bed of clay, through which the caissons will pass, ground— or surface-water may cause difficulty by seeping through the lagging. If it is known, or reasonably believed, that such condition will occur it will be necessary to specify the construction of a cofferdam. This may be accomplished by driving a row of lagging, as the first row, into the ground down to and into clay at least six inches. As caissons are usually started from the excavated basement level this may be easily accomplished. Then a second row of lagging is driven about two feet outside of and concentric with the first row of lagging. The annular space between rows of lagging is then excavated to clay and the space filled with clay obtained from the caisson well. This clay fill must be puddled, rammed and tamped compactly to make it watertight. Circumstances may arise where lagging cannot be driven to clay because of its depth, in which case the means of excluding water in the most suitable manner must be studied and stated in the specifications. But water must be kept out of the wells by some effective means.

Because of the danger of bulging of lagging and consequent menace to the lives of the workmen digging or placing the concrete, it is necessary that work be carried on continuously from the time excavation is started to the time concreting is completed. This will require that the specifications call for continuous work, in eight hour shifts. Sunday work, that is, from midnight Saturday to midnight Sunday, may be omitted and similarly for work on holidays, unless conditions require otherwise.

The caisson wells must be excavated to exact diameter, equal to the designed diameter of the caissons plus the thickness of the lagging and this diameter maintained throughout the length of the caisson except where bells occur.

The first row of lagging must be started exactly plumb and true to circular form and the rings checked for size and trueness to circle. As excavation proceeds the successive sets of lagging must be placed as soon as the proper depth has been reached. Excavation must be kept exactly true to circle and where excess soil has been removed the cavities or voids must be filled with clay, rammed in place. After each set of lagging is placed it must be plumbed and checked for inside diameter and each ring must be checked. Whenever necessary the rings must be wedged to force the lagging against the sides of the well so that the earth, at all points will be restrained sufficiently to prevent bulging and collapse.

Three inch lagging should be used in soils of loose character and two inch lagging in stiff soils, such as clay.

Frequently caisson wells must be placed alongside tall structures, the foundations of which do not extend to depths equal to those of the new structure. Again, in such a location it may be that soil such as saturated clay or quick-sand, or even water, may be encountered unexpectedly. For any of such circumstances the open wells may be carried down as far as conditions permit, from which point steel piling, steel drums or some form of pneumatic caisson construction must be resorted to. If steel piling or steel drums are to be used, it then becomes necessary to decrease the diameter of the caisson an amount sufficient to permit the installation of such devices. This may involve difficulty in the matter of engineering design, but ordinarily the previous soil surveys will have shown that these conditions were to be expected and the upper or open well part of the caisson designed for greater diameter to permit of the required offsets.

Where conditions, as above outlined, are known beforehand the specifications can be written so they may be properly cared for; however it is advisable in all open well specifications to require the contractor to provide such other devices for holding sides of caissons and for excavating to desired depth as may be necessary. Provision for extra compensation must be made unless the specifications specifically provide for such devices or methods for certain portions of the work. Otherwise unhappy disputes regarding costs will arise and no time can be lost in argument while foundation construction of such a precarious nature is under way.

WHEN the depth of wells approaches the anticipated levels careful inspection of the soil must be made and when soil of the desired quality has been reached and the bell has been formed, the bottom must be made level and it must be cleaned so that careful inspection may be had. The bearing ledges for intermediate bells, if there are to be such, must be given equally careful inspection and finally the completed well must be plumbed and the bottom elevation recorded.

It is frequently desirable to drill holes from five to ten feet deep in the bottom of the lower bell so that accurate knowledge may be had of the underlying soil characteristics. Such holes, at first, need only be drilled in wells at corners and one or two in the middle or third points longitudinally and if the soil seems to be in level strata no further holes should be drilled. If indications point to shelving strata it may be well to have additional holes drilled until the architect is satisfied that each caisson will be founded on soil of adequate bearing capacity.

Immediately after final inspection of the wells the concreting must be commenced. The mix of concrete will be discussed in subsequent issues. All concrete must be placed by means of flexible steel chutes not over twelve inches in diameter and having the lower end arranged so flexible that it may be moved around to permit proper distribution of the concrete. The chute should be kept filled with concrete to prevent dropping from extreme height, which, of course, is not desirable. The concrete must be deposited evenly and uniformly and tamped and rodded to remove air pockets and assure a dense mass. When the bottom of the lower row of lagging has been covered about six inches, the lower ring should be removed. The successive rings should not be removed until the concrete is about level with each one. All lagging is left in place. If necessary to restrain the soil until the concrete has set, the rings must be left in place and the specifications must provide a method of compensation for all such rings, as they are expensive and ordinarily the contractor uses them in job after job.

Quite often the design requires that the top portion of the caisson, generally not over two feet thick, be made of concrete composed of one part cement and two parts of gravel or granite screenings passing a one-quarter inch screen. This topping generally is placed after the concrete has had sufficient time to gain maximum shrinkage and should be brought to within one inch of the column base.

If reinforcing is required it usually consists of bars formed circular and is placed in the extreme upper part of the caisson. There is nothing particular that must be specified in the placing of this reinforcing.

As the concreting approaches the designed top the level must once more be checked to eliminate chance for over-concreting, as mentioned above.

PNEUMATIC caissons are of varying types, made of wood, steel or concrete or a combination of wood or steel. Such caissons are used only in soils that are saturated with water or that are composed of quick-sands. Their use generally is resorted to in the city of New York where soil conditions are especially difficult. They are used not only for supporting columns but also to provide a watertight shell around the excavated basement portions.

Pneumatic caissons must be designed for each operation, according to the soil conditions and, also, as the experience of the designer dictates. They may have two shafts, one for the removal of excavated material and one for the passage of workmen or they may have one shaft serving both purposes, in which case there is only one set of air locks. The methods of sinking caissons are determined partly by the ease in which the weights —which ordinarily are iron pigs—may be moved from place to place and partly by the design of the caisson itself. Care must be exercised in the sinking of the caissons that they be kept plumb and that the sinking does not proceed so fast that sudden riding or a boulder or ledge of stone will throw it out of plumb before it becomes too difficult to straighten it out. Such occurrence is, of course, one of the exigencies with which the contractor must contend.

As in the case of open well caissons the pneumatic caissons must be carried down to substantial soil, which usually is bed-rock.

The concreting of pneumatic caissons may be accomplished in several different ways, according to the design of the shield and shafts. Care must be exercised to prevent the air pressure from blowing out the concrete under the cutting edge, or from forming air pockets in the concrete.

Since specifications for pneumatic caisson foundations must be written, generally, for each operation, governed by the conditions and factors that govern or are laid down by the designer it is rather difficult to lay down general rules other than the above. The outline, to appear in a subsequent issue, will include all the important phases of this type of foundations. There are two excellent engineering books on caisson foundations that will explain to the specification writer many of the engineering details from which he can gain sufficient knowledge for the intelligent preparation of specifications.

Laidlaw Building, San Francisco, California

Sylvain Schnaittacher, Architect

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## THE ILLUMINATION OF CHURCHES

### Some Observations on the Optics of Light Intensities and the Psychology of Church Illumination

By HAROLD W. RAMBUSCH

THERE are several reasons why lighting calls for particular discussion by those engaged in designing and beautifying Church interiors. The question is particularly pressing just at this time, because manufacturers are bringing out the high powered lamps; and important in general because lighting experts have just found it profitable to give Church illumination much thought. However this latter may be just as well, for in the matter under discussion it will probably be better to talk and think in other terms than watts, volts and amperes. It is not merely a question of the amount of light but also of the effect of the quality, distribution and position of lighting units upon the congregations and the architecture of the interiors.

There are, therefore to be considered the creating of pleasant and comfortable light for the spectators, the artistic effect of the lighting upon the interiors, and the beauty of the fixtures.

It is obvious that high powered lamps cannot be used nakedly and this brings to our attention the mistake made in using even small incandescent lamps without shielding them from the eyes. The high powered lamp has simply emphasized the need of diffused light. While it is granted that by diffusing the light through frosted or sand blasted glass, about one-fifth of it is lost, it can on the other hand, be shown that this loss is more than compensated by other advantages gained.

It is astonishing how little light really is necessary for illuminating and reading purposes. When an interior seems insufficiently lighted, the reason is rarely a matter of the number of lamps or of their strength but more often of their positions or uneven distribution. One of the most practical demonstrations of how little light will satisfy the eye can be had by subway passengers in New York, Boston and Philadelphia. When the train passes from daylight into the tunnels, it is evident that there is only a fraction of the former quantity of light; but as soon as the eyes are adjusted to the new conditions reading is almost as easy as when the light was stronger.

St. Mary's Church, Johnstown, Pa.
John T. Comes, Architect
Where fixtures are placed directly against either ceiling or walls a glare is produced over those parts which defeats the purpose of the lights

Upon examination it develops that the reason why strong light cannot be used is that when the eye encounters it (and the eye will always gravitate to the strongest light visible) the pupil will rapidly contract. This has two results. First, normal sight and vision of other objects do not return until the pupil has slowly dilated again. Second, that a continual contraction and dilation of the pupil is a severe eye strain. Either of these points would be reason enough in itself to warrant effort to avoid it.

In an ordinary hundred watt lamp the surface of the filament from which the light radiates is only a fraction of a square inch and the eye viewing it encounters a severe intensity of light. Enclose the same lamp in a frosted glass container measuring, for example, about one foot square by two feet high and the light radiates from a surface enlarged several thousand times. The intensity is reduced and the illuminating value is increased proportionately with the diffusing surface. As a parallel, illustrating how intensity affects the eye, one might say that one pound of pressure on a pencil, with the point on the flesh, would hurt, while the same pressure with the other end of the pencil on the flesh would not hurt. It follows that the larger the diffusing surface, the more comfortable the light. But a chain is no stronger than the weakest link and it is therefore, not sufficient that the great majority of the lights are enclosed. The above is equally an argument against the use of small exposed lamps on the outside of the fixture, to illuminate the metal work or structure. This must be accomplished by varying the angles of the diffusing surfaces, unless the fixtures be so designed that when lighted, the silhouette will carry the design.

We know that when the mind is not definitely occupied the eye will always be attracted by the brightest spot in sight. Therefore there must be no brightest spot, unless it be perhaps the Altar, Chancel or Pulpit, illuminated by a flood of indirect light but never by a stronger visible lamp.

If there is one exposed light, the eye is sure to find it and the benefits from the diffused lights are almost lost. There is, however, another difficulty about having one portion of the interior more intensely lighted and the reason is almost entirely phychological. The subconscious mind is egoistic and if the light intensity is unbalanced, a feeling of dissatisfaction is engendered and nothing but the brightest light satisfies. Even if the entire interior were lighted as well as the brightest part, the introduction of a still brighter light would leave the mind unsatisfied.

St. Mary's Church, Johnstown, Pa.
John T. Comes, Architect
View taken after the installation of diffused lighting system. Fixtures are hung low for reading purposes, giving less light to ceilings. The Sanctuary is illuminated with flood light

By actual experiment, it has been established that given a large bowl of glass which is adapted to diffusing light, the fewer the units, the greater the relative amount of illumination. For example, in one case one 500 watt lamp gave as good reading light as five 150 watt lamps. Likewise, it has been possible to illuminate a fair sized Church better and more beautifully with ten fixtures each containing one 150 watt lamp, than it was previously illuminated by one hundred 40 watt exposed lamps. Naturally, the fewer the units, the greater the possibility of accentuat-

The Sanctuary of St. Mary's Church, Johnstown, Pa.,
Showing flood light, with glass dimly lighted towards congregation, making source of light evident. Reflectors in fixtures give a strong light which can be directed to illuminate any part of the Sanctuary. The fixture is hung low for convenience in relamping and adjustment

ing the lights and shadows of the architectural details.

When a fixture is placed on a side wall, little more than half the possible light can be obtained from it. This however is almost the least of the

Our Lady of Guadaloupe Church, Brooklyn, N. Y., with ceiling and wall lighting fixtures

difficulty for it is not possible properly to see the wall itself. In the average Church, to illuminate the walls and the ceiling and to give a good reading light to the congregation it is advisable to place the fixtures at a point almost equidistant from the pews, ceiling and walls. In this way, the maximum light is obtained from the lamp, as it functions in all directions and various effects can be obtained by raising or lowering the fixtures. In the Catholic and High Episcopal Churches it is feasible and usually required that a good reading light be provided but that the auditorium generally be only fairly illuminated. The fixtures can in these cases, be hung nearer to the

Our Lady of Guadaloupe Church, Brooklyn, N. Y., with diffused lights. When fixtures are hung equidistant from surfaces to be illuminated, the maximum light efficiency is obtained without impairing the decorative scheme

pews than to either the ceiling or walls. Generally speaking, the lighting is dependent upon the ritual used. In a High Episcopal Church the lights are hung near the congregation. In a Presbyterian or Methodist Church the ceiling, walls and pews should be equally well illuminated.

The size of fixtures is, as a rule, increased when enclosed and diffused light is used. This is usually an advantage, as it brings the fixture into scale with the balance of the architecture. The mistake is too often made of considering illumination in a class with furnishings and equipment. When it has once been established that to light a Church successfully the fixture must attain considerable proportions compared with columns, capitals, windows, etc., the said fixtures will at once receive their due amount of thought in the architectural design.

St. Mary's Church, McSherrytown, Pa. In the absence of columns, fixtures have been hung as above. They give a perspective line which produces a feeling of side aisle, thus adding to the architectural effect of the interior

The designers of all ages have employed their talents particularly upon useful objects. It is worthy of note that as soon as it becomes evident that an object is needed in the Church, designers always face the problem squarely. This attitude is responsible for the many exquisite candlesticks, choir stalls, altars and pulpits. When, and not until, architects and interior designers recognize that the problem of the lighting fixture is of supreme importance as well from an architectural as from the illuminating angle, this feature of church interiors will be rescued from garish display and brought into harmony with the spirit of the edifice.

# FLOOR LOAD REQUIREMENTS IN AMERICAN BUILDING CODES

THE following summary of differences in live loads in 65 American cities was compiled by Mr. Richard G. Kimbell, of the Architectural and Building Code Bureau of the National Lumber Manufacturers' Association:

| Occupancy | Location | Range of loads in lbs. per square ft. |
|---|---|---|
| Dwellings | 1st floor | 30 — 80 |
| | 2nd floor | 30 — 50 |
| | attic | 20 — 40 |
| Tenements and Apartments | 1st floor | 30 — 80 |
| | above | 30 — 50 |
| Stores—light mdse. | 1st floor | 75 — 150 |
| | above | 100 — 125 |
| Stores heavy mdse. | 1st floor | 120 — 250 |
| | above | 200 |
| Warehouses | Heavy | 150 — 250 |
| | Light | 100 — 150 |
| Factories | Heavy | 150 — 250 |
| | Light | 100 — 150 |
| Roofs | Pitch 20° or less | 20 — 50 |
| | Pitch of more than 20° | 15 — 50 |
| Assembly Halls Theaters, etc. | Movable seats | 80 — 125 |
| | Fixed seats | 50 — 125 |
| | Drill | 100 — 250 |
| | Dances | 100 — 200 |
| | Rooms | 40 — 120 |
| Schools | Corridors | 60 — 125 |
| | Assembly | 75 — 125 |
| Office Buildings | | 40 — 100 |
| Public Buildings | | 50 — 150 |
| Stairways and Fire Escapes | General | 60 — 125 |
| | Assembly | 100 — 125 |
| Garages | Public | 70 — 175 |
| | Private | 40 — 125 |
| Grandstands | | 80 — 125 |
| Hotels | Rooms | 30 — 75 |
| | Corridors | 60 — 125 |
| Hospitals | Rooms | 30 — 100 |
| | Corridors | 80 — 100 |
| Sidewalks | | 150 — 500 |

Realizing that smaller cities are often influenced by the building codes of nearby large cities, the compiler took only places having a population exceeding 25,000 and scattered as widely as possible, in order that the data might be truly representative of the country as a whole. This in itself was quite a task, for, out of the 1478 cities in the United States having a population exceeding 5,000, only 410, or 27 per cent of them, have building codes.*

Excessive load requirements for floors were commented on by the late Frank E. Kidder many years ago. Successive editions of his pocket book have carried the discussion, yet there have always been enough conservative men in positions of authority to prevent improvement in the larger cities. Smaller places, in order to stimulate business and attract industries have revised codes to insure the minimum of cost in building; some not hesitating temporarily to set aside obnoxious provisions, or even repeal the whole code to be obliging when some important manufacturing establishment might thereby be induced to locate in the place and assist in its growth.

The differences are striking when placed in parallel columns. Whose is the fault? Are architects to blame? Are engineers to blame? Are contractors and material men to blame? It certainly cannot be the architects or the engineers, for the subject is one that has been discussed so often that men have wearied of it and set it aside with a "What's the use?", air. The conclusion reached by many authorities is that nobody is to blame except the voters who elect ignorant men to office and intrust them with the preparation of building codes which should be prepared by only skilled men. The politicians are often influenced by local material men who believe that a law which will enable them to sell more material is a good one to have. The writer served as a consultant in the preparation of more than ten building codes and found local lumber dealers insistent upon heavy floor loads in order to sell more lumber. Local brick manufacturers fought against thin walls and plumbers tried to have regulations for minimum numbers of appliances and tried also to have expensive grades specified. Codes having excessive requirements are merely survivals of an epoch when the "practical" man, so called, ruled city councils.

The absurdity of the situation needs little comment. Action is required. It should not require argument to convince men that if a floor load of 80 lb. per square foot is necessary then there are thousands of buildings designed for a 30 lb. load, in which the occupants are daily in danger of death. On the other hand if a loading of 30 lb. is sufficient then cities requiring 40, 50, or 80 lb. are encouraging waste and extravagance. The day for the blind copying of old ordinances by cities thinking they are getting up to date has not yet passed. Only five years ago a town having a population of 3000 wished to have a building code and obtained copies of codes from twenty-five of the largest cities in the country. The town attorney, refusing all proffers of help from the town engineer, proceeded to prepare a building code with the help of scissors and paste pot. When he ran across differences in floor loadings he adopted the heavier loading in every case, "To play safe," as he expressed it. For the same reason he used thick building walls. When in doubt he called on local carpenters, brickmasons and plumbers

* *The American Architect*, Oct. 12, 1921.

for help, in spite of the fact that the town engineer and a local architect were graduates of the State university. He said the code was to be a practical and not a theoretical document. Fortunately the Mayor had some intelligence and balked when the voluminous document was presented to him. He asked if the engineer had been consulted and was informed by the complacent attorney that this was a legal matter and not engineering, that engineers were very theoretical people and that he had been aided by practical builders and dealers in building materials.

The code was not even taken from the table. The attorney was dismissed and the engineer and his friend the architect were told to prepare one. Such happenings with less happy endings, are by no means rare and the action of the Secretary of Commerce in forming a committee to draft a building code which will serve as a basic standard for the whole United States is timely. Until this code is ready it is the duty of every architect and engineer to educate the public on the subject. People must understand that the object of a building code is not wholly "to obtain lower insurance rates," the reason generally given by ignorant compilers. In the meantime the model code of the National Board of Fire Underwriters leaves little to be desired for places where no building code is in existence. It was prepared by men chosen for their competency and freedom from bias.

# BUILDING WALLS IN EUROPE

## Information on code requirements and common practice in Europe in the building of walls of houses

THE two tables here presented will enable architects to compare the European practice with American practice in the design of walls for buildings. The thickness of all walls was given in the original tables in centimeters and heights were given in meters. In transforming centimeters into inches all fractions of an inch were disregarded, all dimensions being given to the nearest full inch.

Table I, showing French practice is taken from E. Barberot's *Constructions Civiles.* Table II, showing German practice is taken from *Hutte,* the leading engineer's hand book in the German language. Thicknesses given are for good quality brick walls. For the best cut stone work multiply the thicknesses in the tables by 0.625 or 0.75; for first class rubble laid up in good mortar multiply by 1.25. Rubble walls are used for several stories.

The standard brick in Berlin is 9.85 in. long, 4.73 in. wide and 2.66 in. thick. The standard brick in Paris is 8.65 in. long, 4.33 in. wide and 2.66 in. thick. The walls are laid up to dimensions given by whole brick, fractions and multiples of brick. Dividing the walls in the tables by the standard lengths of German and French brick the thicknesses may be expressed in this way. This will permit of ready comparison with similar tables using the American standard brick 8 in. long, 3¾ in. wide and 2¼ in. thick. Such a method is even better than a comparison of inches for it gives at a glance the reason for the many odd looking thicknesses.

| Names of floors | Walls: Street in. | Walls: Court in. | Walls: Interior in. | Heights (floor to floor) ft. |
|---|---|---|---|---|
| Foundations | 30 to 39 | 30 to 39 | 23 to 34 | |
| Cellar | 26 " 32 | 22 " 32 | 18 " 24 | 6.40 to 9.15 |
| Basement | 26 " 32 | 22 " 32 | 18 " 24 | 7.93 " 9.15 |
| Ground floor | 20 " 26 | 18 " 20 | 14 " 20 | 8.53 " 15.25 |
| Second floor | 18 " 22 | 14 " 20 | 14 " 16 | 8.53 " 15.25 |
| Third floor | 14 " 18 | 10 " 16 | 10 " 14 | 8.08 " 13.00 |
| Fourth floor | 10 " 16 | 10 " 14 | 10 " 14 | 8.08 " 10.70 |
| Fifth floor | 10 " 16 | 10 " 12 | 6 " 12 | 7.93 " 10.20 |
| Sixth floor | 10 " 12 | 10 " 12 | 6 " 10 | 7.93 " 9.15 |
| Seventh floor | Always a mansard or an attic story with a minimum height of 7.93 feet. | | | |

NOTE: Every room of which the roof forms a part of the walls must have not less than 43 square feet of horizontal ceiling.

TABLE I. USUAL THICKNESS OF WALLS FOR TENEMENT HOUSES IN FRENCH CITIES

In Europe as in America such tables give only basic data. The thickness of a wall varies with the height and the unsupported length. The tables are for walls of ordinary height and with a length of hardly more than twice the height. Strength alone cannot govern wall thickness, centuries of experience having shown that stability is of great importance. Today with improved brick and mortar the desire of many constructors to put up thinner walls than formerly is checked by underwriters. During conflagrations many walls have been thrown down by the sudden expansion of heated air in closed rooms and walls have been wrecked when fierce heat on one side caused a draft which created a partial vacuum on the other side. Sometimes a combination of two actions may be present.

| Names of floors | Walls of residences | | | | | | Walls of factories | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Face bearing wall (with openings) in. | Interior bearing wall (with openings) in. | Gable wall (non-bearing) (no openings) in. | High bearing wall (no openings) in. | Non-bearing gable wall (with openings) in. | Stair wall in. | Face bearing wall (with openings) in. | Interior bearing wall (with openings) in. | Gable wall (non-bearing) (no openings) in. | High bearing wall (no openings) in. | Stair wall in. |
| Basement | 31 | 20 | 20 | 25 | 20 | 15 | 36 | 25 | 20 | 31 | 20 |
| Ground floor | 25 | 20 | 15 | 20 | 20 | 15 | 31 | 20 | 20 | 25 | 15 |
| Second floor | 20 | 15 | 15 | 20 | 15 | 10 | 25 | 20 | 15 | 20 | 15 |
| Third floor | 20 | 15 | 10 | 15 | 15 | 10 | 20 | 15 | 15 | 20 | 10 |
| Fourth floor | 15 | 15 | 10 | 15 | 10 | 10 | 20 | 15 | 10 | 15 | 10 |
| Fifth floor | 15 | 15 | 10 | 15 | 10 | 10 | 15 | 15 | 10 | 15 | 10 |
| Mansard | 10-15 | — | 10 | 10 | 10 | 10 | 10-15 | 10 | 10 | 10 | 10 |

Footings for foundation walls must be figured for an average soil pressure of 2.5 tons per square foot.

TABLE II. THICKNESS OF BRICK WALLS IN BERLIN

### Paint and Varnish

THE latest bulletin of the Educational Bureau, Paint Manufacturers' Association of the United States, Washington, D. C., is No. 141, issued Dec., 1921. The title is "Speed of Evaporation of Thinners from Paint and Varnish Films." It contains also a discussion of the viscosity effects of various hydrocarbons. The pamphlet is sent free upon request to interested parties. The data should be of some value to specification writers.

### Six Centuries of Paper Money

A TIMELY brochure, entitled "Currency Inflation and Public Debts, An Historical Sketch," by Edwin R. A. Seligman, Ph.D., L.L.D., McVickar Professor of Political Economy, Columbia University, has been published by The Equitable Trust Company of New York, with a prefatory note by President Alvin W. Krech.

It is a treatise of unusual interest at this time, because it offers a clear and concise historical background, enabling bankers, statesmen and business men better to understand the present economic situation with its perplexing problems of taxation, price fluctuation, currency instability and the dislocation of foreign exchanges.

A limited number of copies is available for distribution upon request, by The Equitable Trust Company of New York, 37 Wall Street, New York, N. Y.

### Fatigue of Metals

"THE phenomenon known as 'fatigue' of metals under repeated stress might better be called the 'progressive failure' of metals. The most probable explanation seems to be that such failure is a progressive spread of microscopic fractures. A nucleus for damage may be a very small area of high localized stress, due to a groove, a scratch or a crack; in other cases failure may be due to internal inclusions or irregularities of structure: it may be due to internal stress remaining after heat treatment; it may be due to a grain or group of grains unfavorably placed to resist stress; or failure may begin in the weaker grains of a metal whose structure consists of two or more kinds of grains; or it may, of course, begin in any portion of the metal which, by accidental overload or otherwise, is stressed to the yield point."

The foregoing quotation from the latest report on investigations of the fatigue of metals bears out the theory advanced about twenty-five years ago by the late J. B. Johnson. He believed that when the stress on a piece of material caused failure in some portion, that the remaining area had to carry an increased unit stress. This in turn affected another weak spot and as each gave way progressively the increase in unit stress due to decrease in area finally passed the yield point of the sound material. The subject is one of great interest and the publication of the report of the investigation conducted by the Engineering Experiment Station, University of Illinois, in co-operation with The National Research Council. The Engineering Foundation and the General Electric Company, will be of value to engineers and manufacturers. The book contains a Glossary of Technical Terms filling nearly eight pages. It contains also eleven pages of bibliography of books, monographs and articles in periodicals dealing with the fatigue of metals and related phenomena.

## Tests of Large H Columns

IN the Annual Report of the Director of the Bureau of Standards for 1921 it is said the results of the tests of large columns made for the American Society of Civil Engineers showed a systematic difference between the strength of columns made of thin and thick rolled materials. The present series of tests were made to study this effect in columns of still larger cross-section. Thirty-nine columns having cross-sections of five different types, (1) light and (2) heavy built-up plate and angle sections, (3) light built-up channel sections, (4) light and (5) heavy solid rolled sections, were tested in the 10,000,000-pound testing machine of the Bureau of Standards at Pittsburgh. The cross-sectional areas were approximately 40 square inches for the light and 85 square inches for the heavy sections, and the lengths were 12, 18, and 24 feet.

Physical tests and chemical analyses were made on coupons cut from the columns and the results compared with those from tests of the complete columns. The following summarizes the results of the tests:

1. The columns were carefully prepared, their ends were accurately surfaced, and they were carefully centered in the testing machine. This is shown by the uniformity of the stress-strain curves and by the steepness and sudden break in the lateral deflection curves.

2. The differences in the observed average column strength of these columns are almost wholly due to differences in the yield point of the material of which they were constructed.

3. Lack of homogeneity of the material may account in part for the low efficiencies of the heavy-rolled sections.

4. Secondary failure did not occur except, possibly, to a slight extent in the channel section. This shows that the webs were amply strong enough to carry the shear and the flanges thick enough to prevent buckling.

5. A small increase in economy in the use of the steel might be obtained by increasing the radius of gyration of the sections.

6. In view of the controlling influence of the yield point of the material upon the column strength, a more precise standard of definition and measurement of yield point is needed.

7. A properly standardized "drop of beam" yield point will furnish a measure of the strength of column material provided the material is sufficiently homogeneous, but a different measure will be obtained from the "useful limit" point or other extensometer measurements.

8. The yield points determined in commercial mill tests apparently bear no relation to the column strength.

9. Heavy-rolled material bought under the same material specifications (American Society for Testing Materials) will show a lower column strength than light-rolled material, because of a lower yield point.

10. Increase in the ultimate strength of steel, due to increased carbon content, apparently does not increase the yield point as greatly as a corresponding increase due to working.

## A Government Housing Bureau

WITH the appropriation by Congress of $250,000, for the Department of Commerce, to be used as follows:

$50,000 for Continuation of Investigations of Structural Material and for the Collection and Dissemination of Scientific, Practical and Statistical Information concerning Housing, $100,000 for Investigation to Assist New Industries, $100,000 to Co-operate with Government Departments, Engineers and Manufacturers in the Establishment of Standards, Methods of Testing, and Inspection of Instruments, Equipment, and Electrical and Mechanical Devices, a Division of Building and Housing has been organized under the Bureau of Standards of the Department of Commerce. Mr. Franklin T. Miller, the well-known expert of the construction industry who, with Senator Calder, was largely responsible for the securing of this appropriation and the establishment of this division in the Department of Commerce, has retired from active direction of the work, and Mr. John M. Gries, of Urbana, Ohio, has been appointed Chief of the Division of Building and Housing. Since 1914 Mr. Gries has been giving courses in lumbering, business statistics and purchasing as a member of the faculty of the Graduate School of Business Administration of Harvard University.

The Department of Commerce, Advisory Committee on Building Codes, appointed last June, is now actively at work.

# BOOK NOTES

### Perspective Drawing*

ABOUT nine years ago the writer was asked to take charge of an evening class in perspective drawing. The students were errand boys, tracers and draftsmen lately advanced from the tracer status. The man who was to have taken the class had gone away, taking all the notes he had developed while teaching similar classes for several years and for the writer a text was necessary. He was too busy to work up notes within the time allowed. A search through the shelves of several libraries and a leading bookstore brought to the surface "Perspective" by Lubschez, then a new book. It was adopted. The class made excellent progress and several members were encouraged to take up later the more complete and advanced works of Ware and Longfellow. The book is well arranged for the instruction of self-tutored men and in this respect may be recommended.

A third edition is now on the market. A short description of the use of circumscribed octagons as an aid in drawing perspective circles has been included in this edition. A chapter on the history of perspective drawing has also been added. The book contains 13 chapters as follows: Introductory; Preliminary; Making a Drawing in Perspective; Second Problem in Perspective; Vanishing Points and the Point of Station; Measuring Points and Scales; Parallel or One-Point Perspective; Special Manipulations and Short-Cuts; Variations; Oblique and Inclined Lines and Planes; The Perspective of Shadows by Sunlight; The Perspective of Shadows by Artificial Light; Who Discovered the Rules of Perspective?

**Perspective. An Elementary Text Book. By Ben. J. Lubschez, A.I.A.* 115 *pp. Ill.* 5x7½ *in. Cloth. New York. D. Van Nostrand Co.* $2.00.

### Fire Resisting Construction*

THE story is told of General Sherman that when he went to Washington to assume command of the United States Army he was shown a lot of new Government buildings designed in the office of the Chief of Engineers and built under the supervision of officers of the Corps of Engineers. Perhaps it was not Sherman. It may have been some other general. It may not have been a general but some civilian, a newly elected or, newly appointed head of a department seeing for the first time in his official capacity the departmental buildings sheltering government employes and public documents.

**Fire Prevention and Fire Protection; As Applied to Building Construction. By Joseph Kendall Freitag, B.S., C.E. New York, N. Y., John Wiley and Sons, Inc.*, 1038 *pp.* 4¼x7 *in.*, 395 *figs. Flexible binding.* $5.00 *postpaid.*

Whoever, or whatever, he was the story goes that each building was pointed out to him as being fireproof. He went through stone walled halls having brick or concrete floors, traversed room after room with small windows and unburnable walls, floors, ceilings and furniture; regarded the expansive wall surfaces of the plain exteriors dotted with stock size windows glazed with wire glass and embellished with iron shutters. Little by little his loquacity lessened and his cheerfulness oozed away. This however was not noticed by his guides, proud of their work, until at the end of, to them, a perfect day, they asked his opinion of the buildings. The story left them petrified with grief and amazement at the door of his hotel after hearing him say that the buildings in his opinion were "too ——— fireproof."

The official did not know it but the fact is that he, like the majority of mankind had been educated by architects to demand something more than dividends out of buildings. He wanted a building to look like a place within which human beings could work with pleasure and the exterior of which they could regard with satisfaction. In his generation the architect was considered as not necessary in the planning and design of fire resisting buildings. It was work for engineers because considered an economic question. Yet a difference was sensed in the looks of such structures.

Today a knowledge of fire resisting methods of construction is necessary for all architects. Buildings are now designed to resist fire as well as to resist vertical forces from weights and horizontal wind forces. A book on structural design can no longer be the sole reference work but it must be accompanied by a book containing details of fire resistive construction. Mr. Freitag wrote such a book some years ago and a second edition is now on the market. Revisions have been made in every chapter in order to keep abreast of the latest practice and record tests of materials and devices. The chapters in which most extensive changes have been made are those dealing with theatres and garages. The moving picture house is no longer a converted store and garages are planned before being built. The fire danger from such structures has been vigorously handled and the book is up to date in this respect. It is divided into six parts; Fire Prevention and Fire Protection; Fire Tests and Materials; Fire Resisting Design; Fire Resisting Construction; Special Structures and Features; Auxiliary Equipment and Safeguards.

The detailer will find the book a mine of information. The effect of heat on building materials is well treated and taken from official reports written by competent observers. The sections dealing with fire escapes and fire towers are especially good.

# THE AMERICAN SPECIFICATION INSTITUTE


127 North Dearborn Street, Chicago, Ill.




The American Architect and The Architectural Review *has gratuitously set apart this section for use by The American Specification Institute.*

*The Editors and Publishers assume no responsibility for any statements made, or opinions expressed.*

*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review.

## Bulletins

BULLETIN No. Four has been issued as a revision of Bulletin No. One. This bulletin is accompanied by a suggested segregation of subdivisions which members are requested to criticize.

Bulletin No. Five which also has been issued, presents an analysis of specifications that is believed to be unique and yet expresses phases of specifications that are considered, consciously or unconsciously, whenever one is written.

Bulletin No. Six also has been issued as a tentative specification for concrete work. This bulletin has been prepared by the Institute. So far as practicable, use has been made of the Progress Report of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete, which committee consists of five representatives from each of the following: American Society of Civil Engineers, American Society for Testing Materials, American Railway Engineering Association, American Concrete Institute, and the Portland Cement Association. Recourse also has been had to the reports of experiments and research conducted by Prof. Duff A. Abrams of the Structural Materials Research Laboratory of Chicago, and to various other sources of reliable information. The Board of Governors believes that this specification will prove to be entirely practical and invites the most meticulous criticism of all members.

Bulletins No. Seven and No. Eight will be distributed to members between the fifteenth and thirtieth of January. Bulletin No. Seven will be a revision of Bulletin No. 3 while Bulletin No. Eight will consist of matter of extreme interest to all members.

These bulletins will not be published in these columns as complete documents, brief summaries being deemed sufficient for publication.

The Board of Governors requests members to advise the Executive Secretary's office of any topics which they would like to have made the subjects of bulletins. These topics should be restricted to those of immediate interest to the majority of the members.

The Executive Secretary's office has received notice of an erroneous impression that some members and numerous readers of these columns, who are not members, seem to have gained with respect to the publication in The American Architect and The Architectural Review of bulletins issued by the Institute. It should be understood that all activities of the Institute will *not* be reported in these columns and that all members shall see that their file of bulletins is kept up-to-date. The Executive Secretary will be glad to supply an additional copy of each bulletin to members who have mis-laid the copies sent them.

## The Winter Conference

THE Winter Conference will be held in Chicago on the evening of February 10, at the Chicago Engineers' Club.

The subject that is to be discussed will be Bulletin No. Five and it is believed that much of benefit to members will be gained at this meeting. Representatives of all interests concerned with the accomplishment of work under concrete specifications will present their views and if the discussions are at all similar to those had at the December Conference some progress will have been made.

### The Advisory Committee

THE Chairman of the Advisory Committee, Mr. R. J. Gaudy, has appointed the following members of the Institute as members of the Committee:

Mr. Frank Irving Cooper, Boston, Mass.
Mr. William Rice Pearsall, New York City.
Mr. T. E. Billquist, Pittsburgh, Pa.
Mr. C. A. Graether, Detroit, Mich.
Mr. George C. Wright, Chicago, Ill.
Mr. William F. Wischmeyer, St. Louis, Mo.
Mr. J. R. W. Ambrose, Toronto, Ontario, Canada.

In the working out of a plan of Chapter organization that is to be submitted to the membership for action at the annual meeting on May 1, the Board of Governors feels that the assistance of the Advisory Committee will be of the greatest value.

The Board of Governors also feels that meetings in the cities named above should be held concurrently with the Conference meetings in Chicago in order that as many of the members as possible will have an opportunity of coming into personal contact with one another and stimulate the general activity of the Institute.

### Miscellaneous

EVERY member should have received, by this time, a copy of the specification booklet published by the Indiana Limestone Quarrymen's Association. The publication of this booklet marks a very progressive step forward in the compilation of authentic information of great value to specification writers. Members are requested to forward to the Executive Secretary's office whatever suggestions for improvement or criticisms occur to them.

The Executive Secretary's office has received from the Underwriters' Laboratories, Chicago, a copy of "Fire Tests of Building Columns," which tests were conducted by the Associated Factory Mutual Fire Insurance Companies, The National Board of Fire Underwriters and the Bureau of Standards, Department of Commerce. The report consists of three hundred and eighty-eight pages and presents matter of very great interest to members of the Institute.

### New Members

THE following new members have been elected:

John, Macleod Watt, Architect, London, Ont., Canada; Alfred H. Chapman, Architect, Toronto, Ont., Canada; Theodore F. Laist, Architect, Chicago; Gilbert Townsend, Architect, Montreal, Canada; George C. Nimmons & Co., Architects, Chicago; Alexander Thorburn, Architect, Detroit; T. J. Skinner, Architect, Bessemer, Alabama; Howard C. Frank, Architect, Connellsville, Pa.; Raymond W. Jewell, Architect, Binghamton, N. Y.; Otto Gaertner, Architect, New York City.

Mr. Arthur T. North has tendered his resignation as a member of the Board of Governors and, with great reluctance, it has been accepted. Mr. R. Jarvis Gaudy, Chairman of the Advisory Committee, has been elected to succeed Mr. North.

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CHURCH OF S. VITALE, RAVENNA, ITALY

# THE AMERICAN ARCHITECT

## The ARCHITECTURAL REVIEW

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# VON OGDEN VOGT'S "ART AND RELIGION"*

A REVIEW BY ALLEN B. POND, F. A. I. A.

IT may, at first blush, seem a bit odd that the Yale University Press should send to an architectural journal for review Mr. Vogt's "Art and Religion"—a book whose moving purpose is to present a plea for the rehabilitation of "Cultus" in the religious life of modern-minded men. But when, on turning the pages, one discovers that under the term "Cultus" Mr. Vogt includes, not merely creeds and rituals, but the entire external framework and accompaniment of religious expression and observance,—ritual, liturgy, music, sculpture, painting, stained glass and architecture,—one's startled query is abundantly answered. For as Mr. Vogt himself phrases it, "The book is an effort to assist the religious world to a recognition of the category of beauty as a primary and necessary element in the religious reconstruction of the new age."

Is art the veritable offspring of religion or has it merely been a willing handmaid in many times and many places, availing itself of the opportunity afforded by religion,—as it would and does of any other opportunity,—to make life and all its instrumentalities things of beauty? Were religion and art one and the same thing to primitive man and did they become differentiated in man's thought only when, after many years, he had reached a relatively advanced stage in his efforts at philosophical analysis? And even if art—or should one say artistry?—was invariably intertwined with religious expression and observance in the life of primitive man and, for that matter, of man far beyond the stage where he can fairly be characterized as primitive, is this historic intertwining to be interpreted as a proof either that art is or ever was substantially identical with religion, or even that art is only one aspect of a larger somewhat which we call religion? And if the adaptability of a certain subject matter to the purposes of both art and religion—coupled with an occasional unavoidable emotional contemporaneity—is not a sufficient explanation of the historic intertwining of art and religion, are we to find the key in the fact that both spring into being and attain to fullness of life in the field of emotion—of feeling and imagination—rather than in the field of the intellectual faculties, and that in the field of feeling and imagination they travel in part on the same emotional paths?

Would art, as an expression of man's emotional and imaginative life, inevitably have sprung into being and have ministered to his spiritual evolution, even in the entire absence of religion, if such an absence were conceivable? And did art, as I indeed believe, actually find its echo in the heart of primitive man and its expression in his handiwork before ever religion had reached the stage when, led by fear, it sought by the aid of art to thwart or bribe or propitiate the dread unknown? But if the appeal of beauty, the art impulse and artistic activity now have and, since man was man, have had a commanding and ennobling part in his life wholly independent of religion,—which, contrary to opinions cited by Mr. Vogt, I strongly hold to be the case,—how are we to explain the fact that thousands of clear-headed men, among them men of markedly agnostic turn of mind, know by their own experience that, if the esthetic emotion is stimulated to a sufficient degree of intensity, it passes directly over into a religious emotion and is converted into something that can only be defined as a religious experience?

Is it true that, though "the deeper joys of religion are its spiritual joys, trust, and peace, and hope, forgiveness and worthy labor," "it is the artistic side of religion which is the chief source of the enjoyment of it," and that, even in an age of such advanced culture as that upon which we are now entering, a religion which does not enlist the intimate and continuous co-operation of art will repel multitudes of men and these, not the stolid and the trifling, but the most finely and highly organized? Is it true that the Protestant church today and particularly those American denominational branches that have come to us by way of Puritanism are like to become sterile, in spite of their heredity of moral earnestness, just because they turned their backs on art, discarded pretty much all ritual and substituted exhortation and intellectual sparring matches in

* *Art and Religion, by Von Ogden Vogt. New Haven, Yale University Press.* 1921. *Net* $5.00.

barren or ugly meeting houses for worship in a beautiful House of God?

And per contra, can art be other than trivial and shallow, unless the artist, full of the joy of beauty, not only uses his art to recreate that beauty which is the heritage of the past or to give expression to the superficial beauty of the present, but, living in the deeper tides of his time, with heightened imagination, apprehends and in forms of beauty gives body to the forward-reaching spirit of his own age?

And specifically as to Architecture,—what is its province in the domain of religion? Does man try to make temples and church buildings beautiful merely for his own esthetic satisfaction, or also and chiefly because he hopes that that beauty which his inmost being so passionately craves is also dear to Deity and will be credited to him as the offering of propitiation or as the paying of due honor? Or has this essay of man had issue in an unsought something, a by-product capable of exerting a subtile but powerful reflex influence on man himself? In short, has architecture itself a function in ministering to the religious life? Can it help to pave the way to the mood for worship? Has it an indispensable part to play in revitalizing and energizing religion? And, over and above the will to build beautiful buildings, what should the architect, as artist and as scholar, feel and know that will enable him the better to do his share in the creation of a building fit to be called the House of God?

Considerations and questionings such as these are either part and parcel of the subject matter of Mr. Vogt's pages or else inevitably arise in the reader's mind; and that one cannot agree with the author at every point,—and who can agree, in matters of pith and moment, with anybody at every point?—in no way detracts from one's keen and continuous pleasure in reading this admirable book. For though Mr. Vogt states his case and pleads his cause with the deep feeling of one wholly convinced of the soundness of his positions and of the vital importance of art to religion and of religion to the modern-minded man, he is entirely free from the vices of the advocate and from the intolerance that is so often the bane of those who speak in the name of religion.

As may be deduced from the form in which I have cast several of the questions raised by a perusal of Mr. Vogt's pages, I differ radically from the authorities whom he quotes, with apparent approval, on the subject of the identical origins of art and religion. I acknowledge the difficulty of reconciling the assertion of distinct origins with the admitted actuality of the phenomenon of translation of an esthetic emotion into a religious emotion. Yet, none the less, do I hold that the one,—art the child of beauty,—came by way of charm, delight, joy, love; the other,—religion the child of mystery and awe,—came by way of dread, misgiving, wonder; and that,—when dread gave place to hope, misgiving to trust, and wonder to worship,—it was possible for two emotional experiences, distinct at the root, to merge at the top—and this because, in its evolution, religion has moved toward art, not art toward religion.

At any rate, the intimate intertwining of art and religion is one of the outstanding facts of history; and that art has through the ages seized on the usages and observances of religion as a surpassing opportunity for its self-expression, or, —even more strongly the other way around,—that religion has so uniformly availed itself of the penetrating and puissant influence of art in the endeavor, at first, to transmit a compelling message to the dread environing powers and, later still, to draw to itself and hold the allegiance of the hearts of men, may well be urged as proof sufficient of a close spiritual kinship between art and religion—perhaps, as I have already intimated, through the fact that they move in part at least along the same channels of man's deepest emotional being. And, whatever may be the truth or error in Mr. Vogt's assumption of the identity of origins, his development and discussion of the theme of their historic co-partnership is based on a sound psychological foundation; and his thesis, —that a religion, which decries art or, ignoring it, fails to enlist its aid, is doomed ultimately to land on a side-track,—is, in my judgment, equally sound.

It hardly needs to be said that religion as conceived by Mr. Vogt is, although a lineal descendent, far removed, in the evolutionary process, from that fear of the unknown with its propitiatory rites that characterized primitive man. Nor should it be necessary to add that, in espousing the cause of beauty as an essential factor in religious education and experience, Mr. Vogt is not advocating a religion of light-heartedness growing out of light-mindedness—a universe stript of awe, a religion stript of austerity. "Beauty" he affirms, "is one of the three supreme categories of value" (pg. 23)—the others being truth and goodness—and "is one of the essential necessities of human existence." For man seeks through art not only to add beauty to the lesser instrumentalities and usages of his daily life, but even to add a splendor to greatness and further to enhance the nobility of that which is in its essence noble. On this highest plane beauty and art are not incompatible with man's loftiest spiritual life. For, as Mr. Vogt puts it, "to perceive beauty is to be moved by something of the same emotional course as attends the perception of Divinity. And to create beauty is in some sense to participate in the character of Divinity." In truth, "religion and art are alike in the impulse to recreate the world after the heart's desire." (pg. 32)—a beautiful conception, beautifully phrased.

In his introduction and subsequently Mr. Vogt notes the lessening emphasis on the reliance on Art that came in with the Reformation, that reached its climax with the Puritan movement and that has spread its baleful influence with full force over Great Britain and America. Beyond question the divorce of art from religion was unfortunate for both religion and art; the result for art being for the time a restriction of its field and a temporary lowering of its spiritual level. But the hunger for beauty was unquenchable and art gradually adjusted itself to the situation and continued, in spite of the ban, to be a source of spiritual growth. The unhappy effect of this cleavage on religion is Mr. Vogt's theme through many pages. "Religion," he writes, "cannot complete her reformation until she has squared her experience not only with the Scientist and the Moralist but also with the Artist." For—"As there is a world of Science outside the church satisfied with its love of truth and a world of Morality outside the church seeking its own way of goodness, so there is a world of Art outside the church enjoying its life of beauty; and it is a very large world." (pg. 34). "The generation will soon be here which will refuse to worship in ugly buildings, * * ." And in this connection, by way of illustration, our author administers a resounding swat at that architectural abomination of Moab—the square church with its pulpit in the corner, flanked by yards of folding doors. And, by the way, was the inventor of this hideous scheme trying to corner the Deity or only to impound the parson?

Those, who make objection, as so often has been made, that religion is of the "spirit" and art of the "senses"—the flesh, and that the alleged support rendered by art is illusory, have to square their assertion with the emotional transfer to which I have made reference. Addressing himself to this objection Mr. Vogt writes (page 63): "However much we may desire to spiritualize our religion, we are not disembodied spirits, we are compact together of flesh and spirit—'Nor soul helps flesh more now, than flesh helps soul.'" And again, (page 56) in a paragraph whose profound significance should be pondered,—"But the spiritual life as a whole rises from the physical life. If it rises at last purely and freely, it none the less rises from the swathing fires of sensibility. And the kindling of the sense usually requires something tangible, touchable, visible. Spirituality is the great and desirable end; corporeality is the necessary means. Truth must be embodied to be realized; it must be incorporated to be understood. No religious movement has ever been forceful or popular without a rich corporeality. An image, a rite, a creed, a feeling, a feast, a vision, or a sacrament has always been used to embody its truth."

Following up his argument, Mr. Vogt quotes from an editorial in the "Outlook": "There is nothing today so essential to the world as its art. Even the prophet and teacher of religion cannot avail unless he either has in him the creative power of the artist or can enlist that creative power in the service of the ideas he promulgates."

If any reader of these pages is minded to characterize these dicta as the vaporings of a dreamer, I beg to reinforce the argument by reference to a work, which I judge has not come to Mr. Vogt's hand, viz. George Bourne's "The Ascending Effort," which is an appeal for a new religion as a means of giving effect to the otherwise infertile truths of science and for the energizing help of art in building up and making potent the needed new religion. After quoting Sir Francis Galton to the effect "that science by itself is infertile, and must be supplemented by conscience or transmuted into religion," Mr. Bourne continues: "No energy proceeds from simply being aware of things, and perceiving their identities and differences. The sources of power are to be sought not in acquaintance with facts, but in that spontaneous movement of the life-cells which, as it stirs imperiously in all our sub-conscious existence, gathers into passions and desires and resolves, and so at last issues its commands to society in the shape of religions." And, casting about for a way to call into being the desired "religion," Mr. Bourne comes to art—to art "that the Puritan views with so profound a suspicion * * . For its effect upon character is wrought insidiously through the cells and tissues of the body, so that those who come under its sway are as though changed by strange food, with their pulses aglow and their nerves aquiver with new desire. * * For though it sounds paradoxical, the intoxicating power of art is the very thing needed to give the desired effect to the doctrine of science. * * Excepting that science is new as a doctrine, there is nothing new, or at any rate unprecedented, in the proposed alliance; for wherever a conviction has swayed the world it has always been bourne into men's spirits on the wings of art. Christianity supplies an example."

Conceding that religion as a great human interest has lost ground,—what with the preoccupation of men with other and narrower interests and with the fact that religion has not kept pace with the intellectual, perhaps not even with the moral progress of mankind,—Mr. Vogt asks how religion is to go about it to attract and hold the attention of men. "Religion," he writes, "needs art to be impressive, to get a hearing. * * How shall it set forth its first appeal so that he who runs may read? * * At this point the fine art of building is the chief dependence and religion cannot dispense with it." Naturally, therefore, there are many allusions to architecture scattered through the book; and five chapters, XIX to XXIII both inclusive, are devoted primarily to architecture in its relation to the building of churches. That on "Architectural Style" analyzes the historic styles of the western world, with a particular view to their adaptability for the purposes of a modern church for a modern Christianity, and notes the gropings, if the word may be allowed, toward a new style. It is, perhaps, superfluous to make the comment that a writer who sets such store by beauty as a factor in the spiritual life and who places great emphasis on mysticism as a factor in the religious life is not going to be content with a jumble of ill-assorted features on the one side or with a bald meeting-house on the other. The chapter entitled "Structural Tone" is one of the most discerning pieces of constructive architectural discussion I have read in many a day. It, or something that makes its points as clearly and as cogently, should be a part of the instruction at every school of architecture and should be "appointed to be read" every semester in the offices of all architects who build or hope to build churches. The chapter on the "Chancel" will be welcomed by many American architects as an aid in bringing our puritan-sired stock back to a realization of something they never should have forgotten—that in a church a compelling mood toward the worship of God is, in the long run, of more importance than the brilliancy or persuasiveness of the preacher.

I have said that Mr. Vogt was wholly free from intolerance and from the vices of the advocate. Nowhere does this quality appear to better advantage than in the candor and the balance of mind with which he discusses the defects of ecclesiasticism on the one side, with its over-emphasis of and too great reliance on forms and symbols, and, on the other side, the shortcomings of those who over-emphasize the intellectual aspect of religion with a resultant concentration on matters of opinion to the exclusion of the emotions, the imagination, the will—as though men lived in a vacuum instead of in a phenomenal world pulsing with vivid life.

So wide has been the sweep of Mr. Vogt's research, so extensive and so acute his observation, and so clear is his thinking that I find it difficult to see how anyone can resist his conclusions while accepting his implied major premise—that we live in a universe informed by the presence of an indwelling spirit which concerns itself with the lives of men and to which men may lift up their hearts with the assurance of its comprehending sympathy. To all such the book is a challenge to re-organize religion—or should I rather say dogma and observance?—and place them firmly on grounds conformable to modern psychology and to a modern conception of an evolving universe. Mr. Vogt, however, notes the fact that there are, in these days numbers of men standing quite outside the Church. Of what interest will the book be to these folk who, unable to commit themselves to the major premise, are found sitting on the unbeliever's bench instead of in the Amen-corner? Urging the need of creeds that are not "finished," but rather are always open to "newer and later revelations of the spirit," Mr. Vogt adds—"For after all, the humility of agnosticism, so far from being inimical to worship, is perhaps its natural beginning."

Be this as it may, it is certain that those of us who are thoughtful agnostics must subscribe to Emerson's dictum that —"No statement of the Universe, can have any soundness, which does not admit its ascending effort," and must—when pondering on the mystery of life and its unfoldings—long to have faith in the moral integrity of the universe. And to these also Mr. Vogt's book, with its insight into the workings of the human heart and its championship of the "things of the spirit," will make a profound appeal.

Nothing but the necessary restrictions of space —for which my readers may well be grateful— restrains me from quoting and making comment on a hundred or more passages which I marked as I read and re-read the book—things admirably said or provocative of thought. For, to sum up what I hope I have made clear, Mr. Vogt's "Art and Religion" is admirably written, is interesting and highly suggestive from cover to cover, and— more than that—is timely, sane and wise. No thoughtful architect should omit to read it; and paradoxical as it may sound, an architect who is not thoughtful is no architect.

The format is most attractive; the book is so bound as to open well; the page tempts the eye. I noted some half dozen and more errata that got by the author and the proof reader and that should be corrected in a second printing.

# *Report of the Sub-Committee on the Form of Memorial to Soldiers, Sailors and Marines, to be Erected by the City of Boston*

THE Committee appointed by the Mayor of Boston to submit plans for a memorial to be erected by the City to those who gave their lives in the Great War makes the following report. At the outset it submits the general principles which it thinks should be applied in the erection of a memorial and then it submits the plan which it proposes for the carrying out of those principles.

I.

America entered the war for a great spiritual cause—the defence of the liberty of the world. Not only the men in the service, not only the wives and the mothers and the fathers had the vision, but the plain men and women who in the past had only the outlook of daily pleasure—they, too, had the vision; all America had it. And because of the death and the suffering and the anguish endured for a great spiritual cause that vision must not be lost. It should be embodied beautifully and effectively in art so that in those far-off years when this war is forgotten America shall live at its supremest as Greece lives, not by its wars, but by its Parthenon; as the mediæval age lives, not by its kings and bishops, but by the art that embodied in architecture, painting and sculpture the great religious ideals of that age.

Your committee gave much consideration to the question that goes to the root of the whole matter,—should a memorial be a utility or a thing of the spirit? It received many suggestions of utilitarian objects; for instance, a boulevard through the tenement districts of the city or radiating from the center to the suburbs; a City Hall with incidental buildings; and buildings,—and these were many—for semi-private institutions dedicated to public use.

The committee was entirely prepared to admit that these and similar utilitarian objects are important civic institutions and should be built by those particularly interested in such objects. But it thought that such buildings would not themselves be memorials at all. They would and should be erected to house the object of the particular institution. For instance, the City Hall should house in the best possible way the business of the city, a very important object; the community building should house in the best possible way the collective interest of the community in the many and various affairs of the community,—a very natural and desirable thing. Each building might be exceedingly beautiful and effective for its given purpose. But neither would embody in itself the ideals with which America entered the war, the great ideals for which our youth went forward even unto death. Neither would embody these ideals any more than it would embody the religious aspirations of a nation or people.

Aeroplane View of proposed island

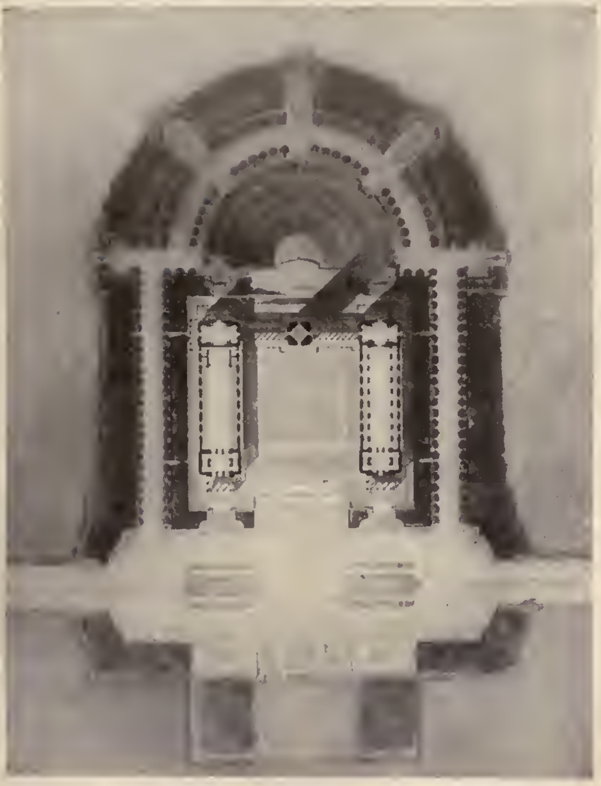
Nor could such structures be made memorials merely by a name or dedicatory inscription. The meaning of a name is soon forgotten, a dedication is soon unnoticed. Thousands have trod Washington Street this day. How many have thought of Washington? Thousands have passed buildings over whose doorways dedications have been carved. How many have noticed them? How many can repeat accurately a single dedication in one of our great cities?

If these utilitarian institutions are not memorials in themselves, and cannot be made so by name or dedication, they should not be foisted on the great emotional desire of the public to contribute to suitable memorials. Your committee submits that buildings to house these utilitarian objects, however important they may be, should be provided either by the city and paid for by taxation, or by private institutions with the money that they can raise for their individual causes.

Yet a memorial used by the public would have a distinct advantage, for a memorial should not be a dead thing; on the contrary it should be a part of the life of the community and an inspiration to the citizens. But use should not be a primary object, it should be incidental and subordinate to the memorial — its setting or environment. A park or common, itself beautiful and convenient is a good instance of this, whether the memorial that dominates it is the flag and tablet of a village or the uplifting tower of a great city. The park or common has the advantage over the civic building that it is used far more largely by the public. It has the advantage over the boulevard in that it gives to a far greater degree the opportunity for unhurried and unjostled contemplation.

Turning away from the so-called memorials which are really in substance and in form utilitarian objects and taking up memorials in the true sense of the word, your committee gave much consideration to the question of what phase of the

Plan of the proposed island to be built in the Charles River Basin between Boston and Cambridge. The island faces easterly down the Charles River Basin. The bridge from the lower half of the picture leads from Boston and thence from the island to Cambridge. The outline just at the right of the Cambridge end of the bridge shows the location of the buildings of the Massachusetts Institute of Technology



Ground plan

war should be embodied, for war has many and varied phases and the memorials of those phases should be correspondingly many and varied. For instance, we may wish to memorialize the great human qualities of courage and suffering, felt on both sides of the Atlantic, for they are great human qualities: thus the sculptured figure of the man who leads the charge across No-Man's-Land may express courage, while that of the bowed and broken mother may express suffering. We may wish to memorialize the triumph over our enemies as in those splendid Roman arches that symbolize the power and the dignity and the triumph of ancient Rome,—the spirit that their triumphal processions manifested with their captives. Or, lastly, we may wish to memorialize, as the committee hopes, neither courage, nor suffering, nor triumph, but something which transcends them,—the great spiritual ideals of right, justice and liberty with which America entered the war. Your committee hopes that Boston will see to it that America lives an inspiration to all ages through a memorial that embodies beautifully and effectively these great ideals.

II.

In full belief in these general principles your committee submits the following plan with diagrams of the memorial which it thinks should be erected.

(1) The plan proposes that an island of perhaps ten acres shall be built in the Charles River contiguous to at least the western side of Harvard Bridge. The site for a beautiful memorial could hardly be surpassed. The convenience of access is assured by contiguity to the Bridge, for Massachusetts Avenue is destined to be more and more the great north and south thoroughfare of the city. There would be practically no cost for the land for the island, only for reclamation, as it would presumably be made out of land dredged from the Basin. Moreover, it will be necessary in the near future to rebuild Harvard Bridge, and an island which will shorten this bridge 800 or 1,000 feet will materially lessen the cost of the two bridges on either side of it.

Westerly Front

(2) Upon this island the plan proposes a high tower rising from a colonnade and containing a great carillon or chime of bells. The tower would have somewhat the same uplifting spiritual dominion over its environment that a cathedral has over a countryside, or that a New England church spire has over its village. It will be the manifestation of a great spiritual aspiration; and if well carried out will always embody the beauty and inspiration of a great ideal. Yet this beauty and inspiration can reach the heart not only

through the eyes but through the ears. So the plan proposes that a great carillon or chime of bells be installed in the belfry of the tower. The sudden although infrequent drifting of music of a high spiritual significance over the river and far into the city would reach many whose thoughts are dwelling on vastly different things. It would arrest and appeal. Traditions might easily grow under it. The tradition of raising the hat as the flag goes by is of distinct value in developing an expression of true patriotism, and yet it is the development of very recent years.

(3) In pursuance of the statement of general principles made above, the plan proposes two utilities both important yet both incidental and subordinate to the memorial:—

(*a*) The erection of an open air auditorium west of the tower capable of holding a very large number of people, gathered together for objects harmonious with the object of the memorial; very likely gathered in the summer from all parts of the country, for instance, the meetings of the Veteran Associations. The fact that the use of a very large auditorium would not be frequent and that the cost of erecting it would be very great, precludes, if nothing else does, the erection of it as a part of the memorial.

(*b*) The development of the residue of the island with trees and shrubs and grass, making with its presumably indented shore line a beautiful water park open to all the public,—far and away more beautiful than the Esplanade is with its barrenness and dazzling glare.

The committee believes that the memorial proposed could be erected at a total cost of not over $2,000,000.

The committee's drawings incorporate, in connection with the memorial which it recommends should be built by the city, two wings extending toward the east to contain units for the state or other organizations if they desire to co-operate. The wings might contain a small auditorium, a war museum, a war library, and records.

Charles A. Coolidge, Chairman; John K. Allen, Frank W. Benson, Ralph A. Cram, Cyrus E. Dallin, Morris Gray, Charles D. Maginnis, A. A. Shurtleff, R. Clipston Sturgis, C. Howard Walker.

Easterly front

# A SIMPLE FORM OF COMPETITION

## By Comparison of Evidence of Ability and Experience Based upon Record of Work Actually Performed

By THOMAS CRANE YOUNG

THE difference between this and the usual form of architectural competition lies in the fact that instead of submitting for judgment a set of specially prepared drawings intended to solve a stated problem, the candidates submit photographs, documents, and information as to work already performed. Such data, if reviewed by an expert, would afford at least equally valuable material upon which to base a sound judgment as that obtained in the usual way.

For example: An Owner (one instituting a competition) desiring to choose an architect would first retain the services of a Professional Adviser (as defined in the American Institute Code.) He would prepare an invitation and program stating the conditions of the competition, together with a *questionnaire* to be filled out and-signed by the competitor, giving information as to education and experience in conducting building operations, photographs of buildings of which the candidate is author, set of working drawings and specifications used in such a building, or other information useful in effecting a judgment of the qualifications of the candidate satisfactorily to conduct the work contemplated. When all of the information collected in the manner described has been received by the Owner, it would be turned over to the Professional Adviser who would examine and compare same and advise the Owner, in a written report, as to the relative merits of the candidates.

This method of selection seems to have merit where the object of the competition is the choice of an individual (or firm) best qualified to carry to a successful conclusion the project under consideration and not the determination of a definite plan.

Such a form would enable the Owner to acquire information upon which to base a choice, covering *all* phases of an architect's work, and at no expense except for the services of the Professional Adviser. It would enable the Owner to show good and sufficient reason for the choice when made. Dissension over the qualifications of rival candidates would be avoided. The competitors would be assured of consideration, by an expert, of their qualifications, without discrimination, and at a mere nominal expense. Criticism by unsuccessful competitors would be minimized or eliminated.

A competition of the sort described was recently held in St. Louis with satisfactory results. As an example, the questionnaire used in that particular case is given herewith.

### QUESTIONNAIRE

#### Evidence of Ability and Experience

*General Character of Evidence.* The following evidence, submitted in the form of separate exhibits as described below, will be received by the Building Committee and examined by the Professional Adviser.

The word "you" as used below means either an individual acting as principal or a firm in which the individual is or was a principal.

#### Exhibit "A"

*Professional Training and Experience*

(a) Statement of your professional school training.

(b) Statement of your professional experience before entering independent practice. Give the name and location of architects with whom you were employed.

(c) List of buildings, not exceeding five, for which you were mainly responsible while in employ of others; for each give the name of employer and approximate date of construction.

(d) Were you designer or engineer, or both?

#### Exhibit "B"

*Building Executed.* Names of not more than five buildings which you consider your best work and which were executed by you as principal. In each case give the name of the designer and the structural, mechanical and electrical engineers, the name of the owner and of the contracting builder, the location of the building and the approximate date of construction. One of the buildings, at least, should be in or near . . . . . . . . . . ., where it can be inspected.

#### Exhibit "C"

*Photographs of Executed Work.* Photographs of not more than five buildings preferably those described in Exhibit "B". These shall be of uniform size, about 8"x 10", and mounted on 10" x 14" card mounts, unframed. (The purpose of these photographs is mainly to show evidence of character and quality of design.)

If desired, include a criticism of the buildings illustrated or explanation of the design, including features for which you do not consider yourself responsible, or which you would have changed if given opportunity.

EXHIBIT "D"

*Office Practice*

(a) Is designing done by firm member or employee? Name of chief designer mainly responsible for recent work, giving also name of building.

(b) Name of designer who would be responsible in largest measure for the design of the contemplated ... in case you were appointed architect.

(c) Is structural engineering done by firm member? Name of structural engineer responsible for recent work, giving also names of buildings.

(d) Is mechanical engineering done by firm member? Name of mechanical engineer responsible for recent work, giving also names of buildings.

(e) Is electrical engineering done by firm member? Name of electrical engineer responsible for recent work, giving also names of buildings.

(f) Is any of your engineering work done by material dealers or sub-contractors?

EXHIBIT "E"

*Office Organization*

(a) Is your firm organized as to special fields of duty for principals?

(b) What duties in general are allotted to the different members?

(c) Is a bookkeeper regularly employed by your firm? Have you an organized accounting system? Was your system installed by a Certified Accountant? Name of Accountant. Are your books regularly audited by a Certified Accountant?

(d) If employed as architect for the proposed ............, would you be able to execute the work with your present scheme of organization and business system?

(e) What new departments, if any, would you add to your organization?

EXHIBIT "F"

*Working Drawings and Specifications.* Complete set of contract drawings and specifications including general, structural, mechanical and electrical drawings and specifications for one building which you consider representative of your best work.

These may be originals or reproductions.

EXHIBIT "G"

*Additional Statement.* Any desired statement of experience or ability not covered in the above exhibits.

*Form and Delivery of Exhibits.* Written exhibits shall be typewritten on plain paper, letter size, and shall be confined strictly to the topic named, which topics shall be arranged in the order in which they appear and shall bear the signature of the individual or firm submitting the same. Each of the above exhibits shall be enclosed in a separate sealed package, each marked (Name of Building) and Exhibit "A", Exhibit "B", etc., as the case may be. These packages shall contain no other exterior marking. The separate exhibits shall then be wrapped or bound together in a single sealed package and addressed to (Name of Chairman of Building Committee) and delivered to (address) on or before the.... day of ............, 1922.

(Signed)

..................................
(By members of Building Committee).

..................................
Professional Adviser.

Dated ................

# THE QUANTITY SURVEY—WHAT IT IS AND WHAT IT OFFERS*

## Being the First of a Series of Articles Discussing the Various Steps in the Preparation and Use of a Quantity Survey

By Wm. GRAVES SMITH

*President of The Quantity Survey Company*

A QUANTITY survey organization can point out to an architect wherein a set of drawings and the specifications for a building, the basis of a building contract, are incomplete, or indefinite, or contradictory, or erroneous. Unless a survey is made, such faults may be called to his attention in an unpleasant way in the shape of demands for extras or concessions. The point is that every architect's office may at any time suffer from such causes simply because draftsmen and specification writers are not infallible. The best of them occasionally fail exactly to register their intentions.

A quantity survey organization offers an unprejudiced, impartial, disinterested, critical examination of the basis of the building contract. Making a quantity survey is a test for completeness and definiteness. The surveyor's office is the proving ground of drawings and specifications for constructive purposes. Making a survey is like making a complete model. The surveyors mentally build every part of the building. If there is insufficient information to do so, or if anything is indefinite or contradictory, or erroneous, the architect is consulted. His decision is incorporated in the survey quantities. If changes should be made in specifications or plans, the architect has an opportunity to make them before they are submitted to bidders. The bidders collectively might discover all the items taken up by the surveyors but they would not consult with the architect about them. The result would be lack of uniformity as to interpretation, and variously inaccurate quantities as to the basis of bids.

There are all sorts of things that may not be caught in the checking up of the drawings and specifications in an architect's office. The draftsmen or the specification writers are too familiar with a job to give it the best check. They know what they intend to show and believe they have done so. The surveyor studies to find out if the man who must execute the design has all the information he needs in order to know exactly what must be built. Either each contractor bidder must do this himself, or some competent go-between like the surveyor who can take his point of view must do it for him.

If an architect wishes to be sure that all bidders understand exactly what must be delivered under contract and thus secure bids on uniformly accurate data, he must have a quantity survey made and use it as the basis of bids.

There have been many instances where the check given by the surveyor has saved several times its cost. The most common faults are the overlapping of work, as specified for the various sub-contractors. The easiest mistake to make is apparently failure to state correctly in the specifications just what the writer has in mind. For example, a glazing specification intended to cover only interior partitions and doors was so worded that any bidder would easily have construed it to mean the glazing for the entire building. A visit to the job would not have enlightened him, because the exterior glazing had not been done although it had been bought. This item involved several thousand dollars,—several times the cost of the complete survey, which was unquestionably saved by having the error pointed out by the surveyor and corrected before asking for bids.

The value of a surveyor's check in helping an architect perfect his drawings and specifications cannot unfortunately be used by an architect as an argument with a client as a reason for having a quantity survey. But it should be an incentive to architects to secure surveys, and fortunately there are other sufficient benefits and economies resulting from the use of surveys to make their use a matter of sound business.

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* *The author of these articles invites letters from readers embodying criticism and a general discussion of all phases of the Quantity Survey. These communications will be answered and discussed in future articles.*


REPRODUCTION OF A PENCIL SKETCH FROM THE OFFICE OF CHARLES A. PLATT, ARCHITECT

# ·EDITORIAL·COMMENT·

PERHAPS THE FIRST ART SOCIETY to inaugurate traveling exhibitions was the National Sculpture Society. The first of these peripatetic showings started on its travels some fifteen years ago and was instantly successful. They not only served a valuable professional purpose, but they also made it possible for the art-loving people in the smaller cities where these small pieces of sculpture were exhibited to become educated in the fine decorative possibilities of the sculptor's art. Many sales were made. The war caused a suspension of the traveling exhibitions.

It is gratifying to learn of the activities of The American Federation of Arts in the matter of traveling exhibitions. Collections of oils and watercolors, prints, posters, photographs and etchings are being assembled and started on their travels. Requests for these exhibitions have been received from towns and cities from coast to coast. Their educational value may not be over-estimated.

Why not traveling exhibitions of architecture? The fact that the Own Your Home exhibition held annually in New York and Chicago attract large numbers of people is evidence of the wide-spread interest. Carefully selected, easily transportable small collections of architectural work would be eagerly accepted by small cities all over this country. The motive of such exhibitions would be purely educational. There would be no sales as in collections of the painter's and the sculptor's art. But there would be a growing appreciation of good architecture.

The Architectural League of New York, in its splendidly maintained efforts to encourage craftsmanship, could select from its exhibition just opened, material for a traveling exhibition that would have the highest educational value. The expense would be insignificant in proportion to the good results. Every community desiring such an exhibition, would gladly pay the small cost of transportation.

* * *

AT A RECENT MEETING OF THE Royal Institute of British Architects, Mr. Thomas E. Collcutt, past president of the Institute, read a paper on A Plea for a Broader Conception of Architectural Education.

Mr. Collcutt stated that while architects, more than any other body of men, are suffering from the effects of war, and while the future for activity of practice is gloomy, students and yet more students are encouraged to enter the architectural schools. It was pointed out that in the *Ecole des Beaux-Arts,* but ten per cent of applicants were permitted to enter. Mr. Collcutt suggested that no student should be finally accepted unless he can show, on a short probation, that he has a peculiar natural aptitude or tendency to architecture above any other calling. This "aptitude" should be ascertained by a body of examiners independent of the schools. Of course remarks Mr. Collcutt, such an examination should be confined to architecture; steel construction and perspective coloring should not be considered.

We might very well pursue a similar course in this country and eliminate the "misfits" that are cumbering the profession.

It is interesting to note the method of examinations proposed.

* * *

THE FACTORS WHICH MORE LARGELY enter into the problem of building construction are, according to a forecast of the building outlook during the coming year, issued by the Committee on Statistics and Standards of the Chamber of Commerce of the United States: high price of materials, high price of labor and the matter of obtaining funds for construction. The present prices of materials are regarded as the most favorable, but, to quote the report, "the matter of too high priced labor does not stack up so well as that of material, but there is a general belief that not only are matters improving in this direction, but when springtime comes the long period of probable idleness of labor will naturally tend to bring about a much more favorable solution of this problem than is now presented." In some sections of the country the matter of obtaining money for building construction is still a difficult problem.

* * *

IN A RECENT ISSUE OF THE JOURNAL *of the Royal Institute of British Architects* Mr. F. Welman contributes an article on Capitals and Bases: A Theory of Their Evolution. Mr. Welman treats of the earliest capitals and bases as denoting the beginnings of architecture, and states that in some form or other, they have been adopted by every established school of design and their contemporary use is practically universal.

In an analysis of these architectural features, he deduces that the only function they could exercise in a stone construction is that of spreading courses, and that in view of their normal inadequacy in that respect, he believes it is obvious that they were not designed for the purpose and they cannot be regarded as "attributive" to it. Further, that as capitals and bases are not accessory to a stone construction, it is assumed that they are reproductions of members accessory to the prototype construction of reed or timber columns. He then goes on to advance the somewhat original contention that the function of members at the extremities of such columns would obviously be that of damp-proofing and, therefore, it is concluded that the primary "capitals" and "bases" were damp-courses and that stone examples are the later conventionalized reproduction of the same.

It will, therefore, be seen that Mr. Welman attributes the origin of capitals and their bases to one purely utilitarian, and not, as is commonly supposed, a decorative or ornamental feature. "In short" states Mr. Welman, "the primary damp courses are indicated to have been 'puddings' of bitumen."

* * *

THE ARCHITECT'S JOURNAL, OF LONdon, in an editorial in a recent issue, states that there is an indication of a "back to the road" movement in England that will give railway directors some serious problems to consider. Motor vehicle routes are, it is stated, being established, and competing seriously for both passenger and freight traffic. In this new movement there is entailed more than the lowering of fares and freight rates. The efficiency of all transportation, quickness of despatch, and promptness of delivery combined with lower freight rates, menaces the ordinary local triffic of railway transportation.

Further, *The Journal* sees in these conditions a possibility that the country house will be differently designed and differently situated, and that motor vehicles may possibly do for the railroads what the railroads did to the stage coaches,—render them obsolete.

This heavy traffic will naturally work a very decided change in road construction, and will provide new problems for the road engineer and also new problems for the governments to consider in the charges for maintenance.

During the war the necessity for quick transportation in the United States of material from inland towns to the coast made it necessary to develop motor routes which efficiently served during a great emergency. Long hauls with heavy loads were common, and the congestion of railway lines was greatly relieved by these motor routes. Since the Armistice, however, conditions have decidedly changed and these motor lanes of traffic no longer exist, but it seemed that England, learning a lesson from her conditions, has not only maintained in a great many instances these motor lines of traffic, but proposes to increase their number and in this *The Journal* sees a menace to the usual railroad traffic.

St. Cloud

*(From the Photograph by Robert M. Blackall)*

MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK

C. HOWARD CRANE, ARCHITECT


MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK

C. HOWARD CRANE, ARCHITECT

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MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK
C. HOWARD CRANE, ARCHITECT

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MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK

98 4

MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK

C. HOWARD CRANE, ARCHITECT

98[5]

HOUSE OF NICHOLAS BRADY, ESQ., MANHASSET, L. I., N. Y.

JOHN T. WINDRIM, ARCHITECT

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HOUSE OF NICHOLAS BRADY, ESQ., MANHASSET, L. I., N. Y.
JOHN T. WINDRIM, ARCHITECT

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HOUSE OF NICHOLAS BRADY, ESQ., MANHASSET, L. I., N. Y.

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JOHN T. WINDRIM, ARCHITECT

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HOUSE OF NICHOLAS BRADY, ESQ., MANHASSET, L. I., N. Y.

JOHN T. WINDRIM, ARCHITECT

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HOUSE OF FRANCIS KEIL, ESQ., SCARSDALE, N. Y.

A. J. THOMAS, ARCHITECT

# NOTES ON ILLUSTRATIONS

### The Music Box Theatre, West 45th Street, New York

C. Howard Crane, *Architect*

THE demands in New York for theatres are only second to those for hotels. The enormous transient population of New York City must be housed and must be entertained. With each new large hotel opened there follows a new theatre, until that section popularly known as the "White Light" has become a colony of houses of amusement.

The Music Box Theatre, illustrated in this issue, is one of the latest and most artistic additions to New York's large number of theatres. As will be seen by reference to the illustrations and the accompanying plans and sections, it presents some unusual features both in its architectural treatment and in the method of its planning.

Again like the hotel, the modern theatre has lost its one-time spectacular and over-decorative features, and has now become remarkable for the quiet dignity of its design and in its plan for those elements of comfort and luxurious ease that modern conditions would seem to demand.

The main façade, consisting of a loggia with well proportioned columns flanked on each side by pavilions with a Paladian motive, is built of Indiana limestone.

The main auditorium which seats 1,000, is directly entered from the lobby to a foyer or standing space in the rear of the seats. This space is separated by a draped partition, obviating the usual draughty space to be found in most theatres.

The color scheme of the auditorium is of antique ivory, glazed in soft green, and this color motive has been carried out practically in all parts of the auditorium. This harmonious color scheme has a unifying effect and in no wise savors of monotony.

To meet the wishes of the owners, first floor boxes have not been designed and it has thus been made possible to introduce a pleasing form of second floor boxes which, with their ornamental iron rails, finished in dull silver gray, lend a very decided decorative charm to the motive of the proscenium treatment.

The lighting fixtures are of Dutch brass with amber crystals.

As will be noted by reference to the plans, that part of the floor below the orchestra has been designed for the comfort of the patrons of the theatre, and arranged in a series of attractive lounges and relating spaces. The main staircase in the orchestra foyer descends on both sides to a spacious landing and is continued as one to the lounge. These lounging rooms have received the most careful consideration on the part of the architect, and in their decorative treatment are perhaps as satisfactory as any theatre of recent construction.

While the depth behind the curtain is restricted, the lack of working space has been largely overcome by the use of a well arranged counterweight system which has resulted in ease of manipulation and greatly simplifies the manual labor in the setting of the stage. The dressing rooms have received as much care in their detail, finish and lighting as that part of the theatre used by the public, and this unusual feature has made the Music Box Theatre one to receive the very enthusiastic approval of the members of the theatrical profession who are engaged in work there.

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### House of James Roy Allen, Architect, Chicago, Ill.

A FEATURE of the exterior of this house is its construction of common brick stained white, with a course of thin tile projecting about three-quarters of an inch beyond the face of the wall every third course of brick. The effect obtained is an unusually pleasing one and is accented by the roof of red Spanish tile.

The plan of the interior is one of exceptional excellence in a small house, and affords a maximum of good living conditions, with convenience of arrangement and a certain homelike character that is of unusual attractiveness.

The entrance loggia is of white plaster with a black and white tile floor. The walls of the living room, from floor to ceiling, are of walnut paneling and the living room has an arched plaster ceiling. The floor is laid in black and white tile eight inches square. The fireplace is of cast cement.

In a letter received from the architect, he states that the idea in planning the house was to have a complete, unusual house without waste space and built in such a manner as to be above the average small house. It would seem that the effect has been admirably achieved.

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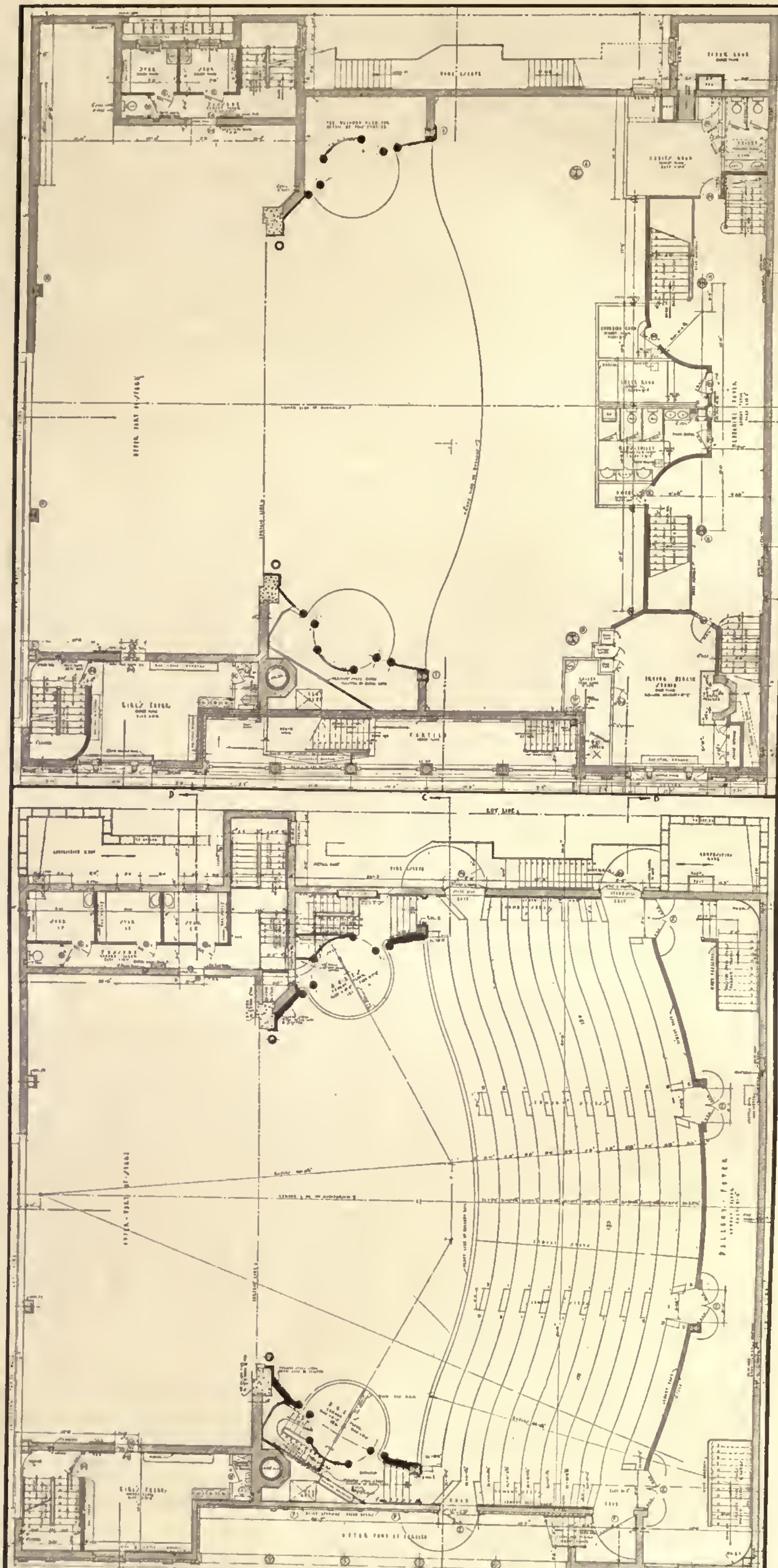
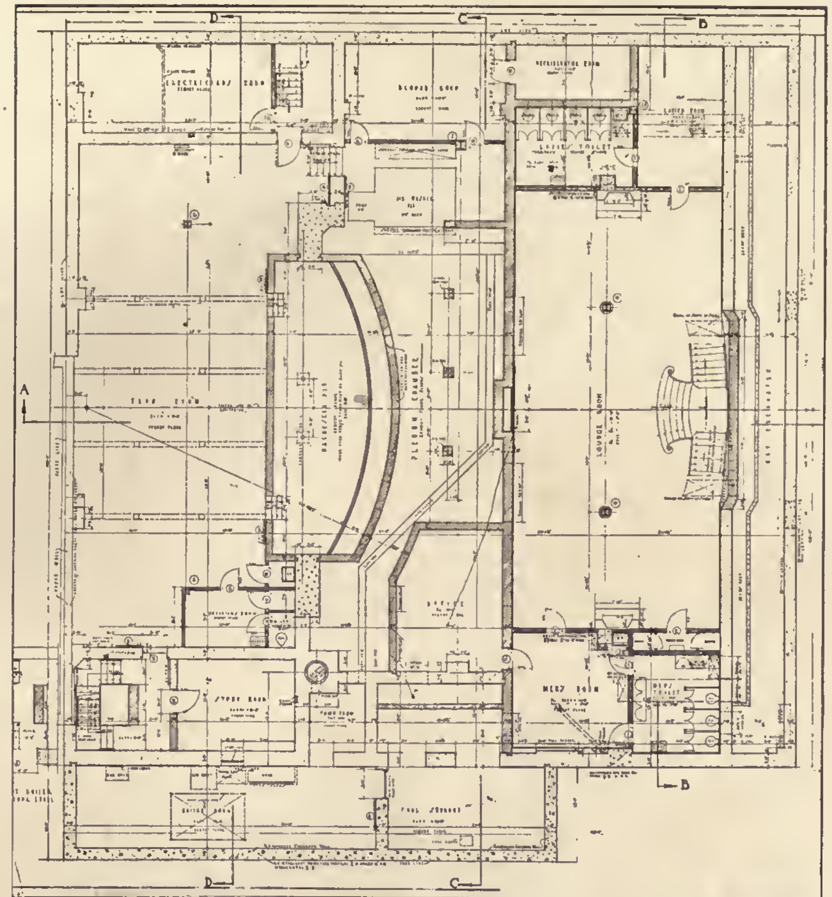


MEZZANINE PLAN

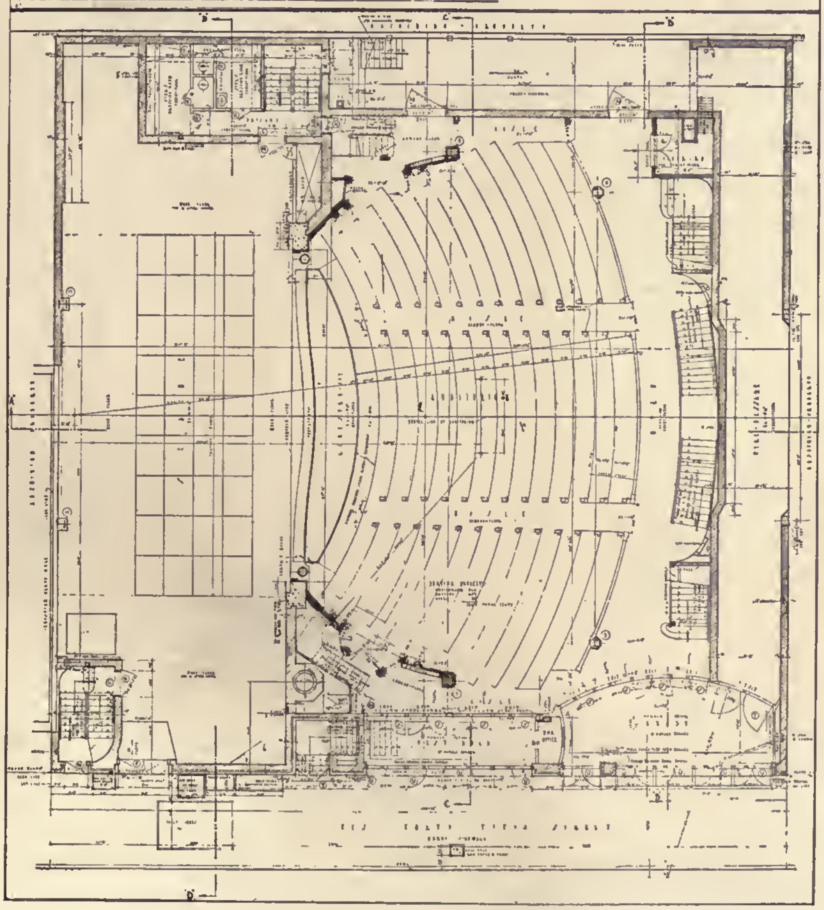
BALCONY PLAN

MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK

C. HOWARD CRANE, ARCHITECT



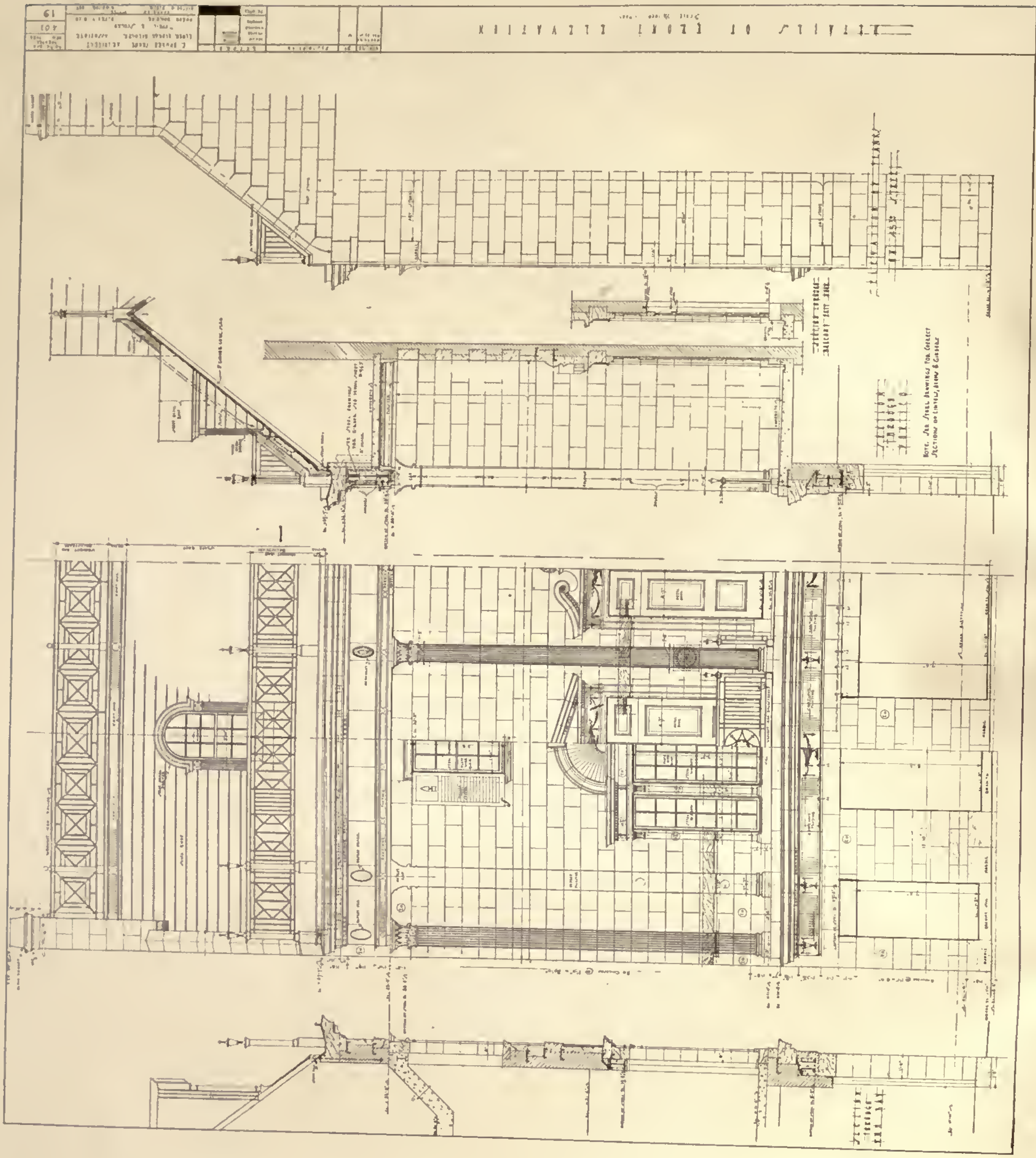
BASEMENT



AUDITORIUM

MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK

C. HOWARD CRANE, ARCHITECT



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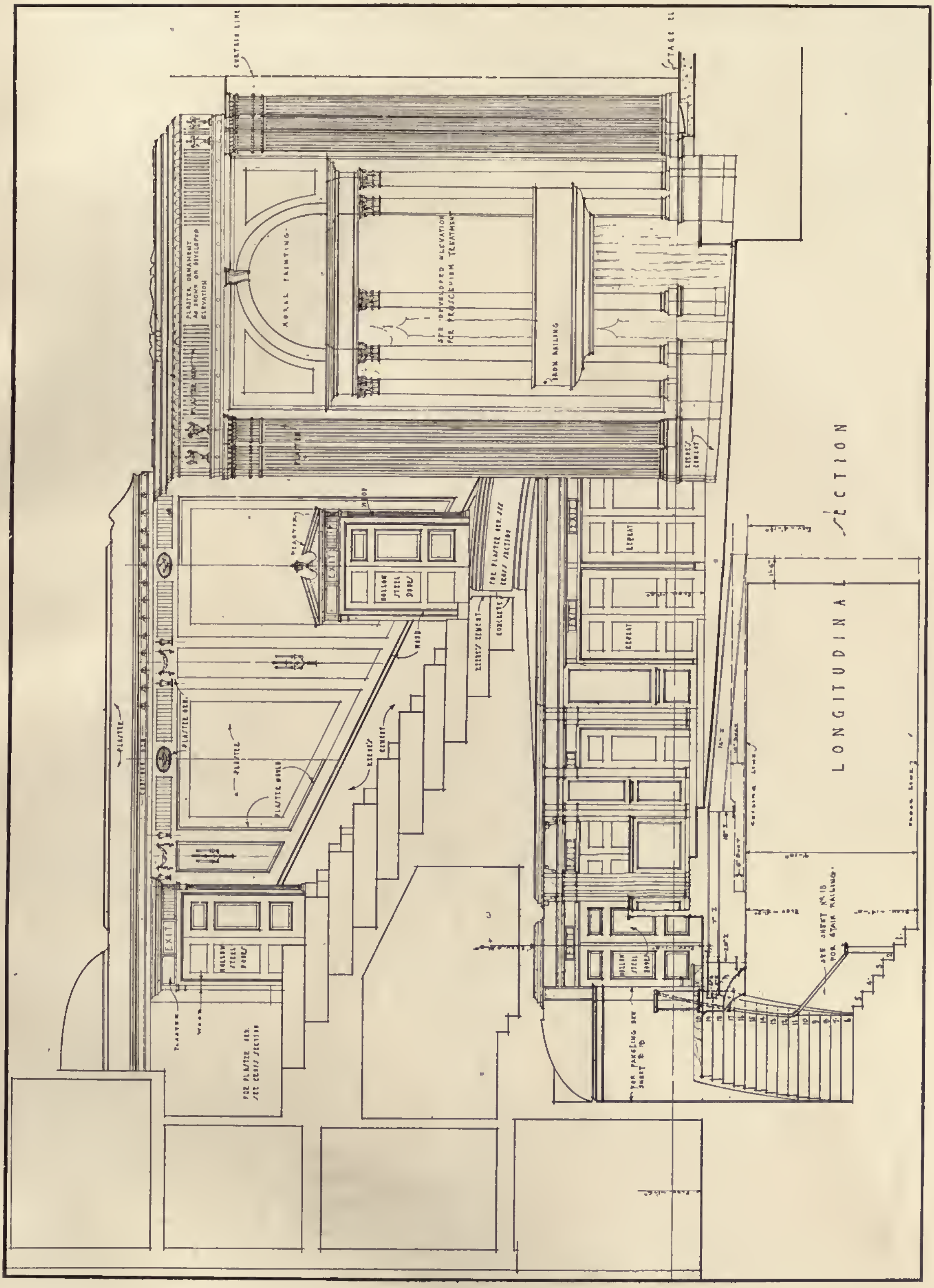


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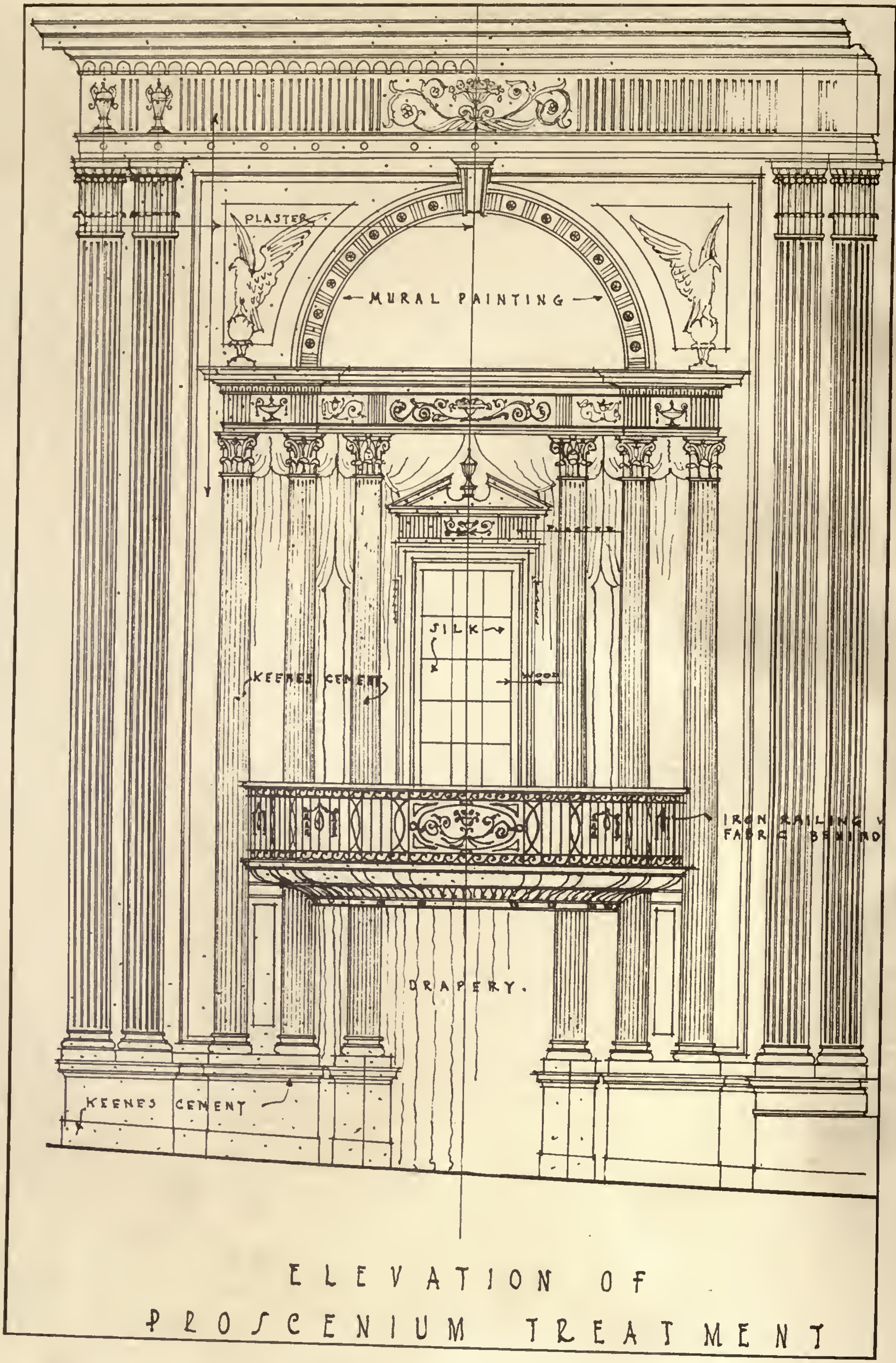
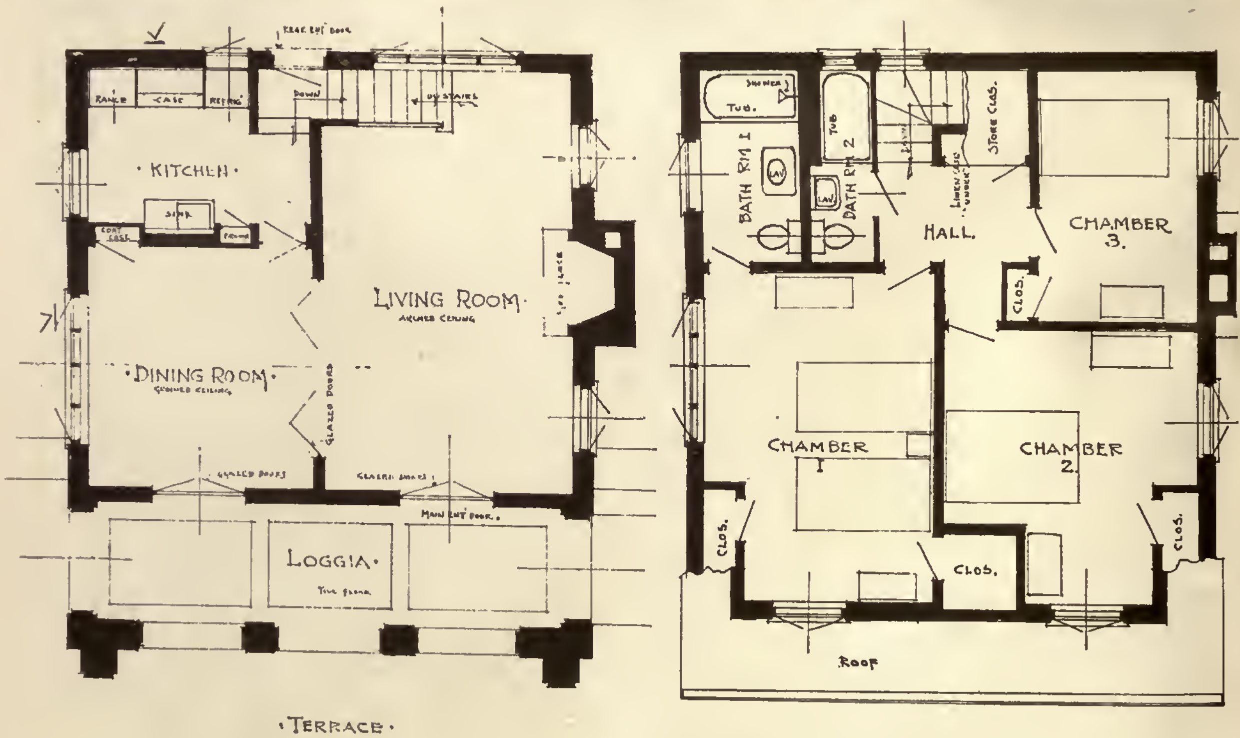



MUSIC BOX THEATRE, WEST 45TH STREET, NEW YORK
C. HOWARD CRANE, ARCHITECT

HOUSE OF JAMES ROY ALLEN, ARCHITECT, NORTH SHORE, CHICAGO, ILL.




HOUSE OF JAMES ROY ALLEN, ARCHITECT, NORTH SHORE, CHICAGO, ILL.

# LEGAL DEPARTMENT

Conducted by

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

READERS of THE AMERICAN ARCHITECT may remember references which I have made elsewhere to the broadening in recent years of the scope of the New York law on mechanics' liens. As the law originally stood, the architect, in order legally to maintain and enforce his lien, was compelled to show that he had actually supervised the work done. It was not formerly sufficient that the architect prepare the plans and specifications and that the building be erected in accordance with them. It is manifest that this former rule was not in accord with the spirit of the lien law. The intent of lien legislation was to grant a lien for work which entered into and improved real property. Of course, plans and specifications, used in the erection of a building on real property, very directly entered into this improvement. To say that because superintendence was lacking, a lien could not be had, and, for the legislature to enact a law which would not allow a lien to be based on plans and specifications unless accompanied by actual superintendence, was neither logical nor fair to architects. It was this fact probably, that led the New York legislature to amend the lien law and to change the wording of the law so as to make possible a claim by an architect for a lien on the basis of the preparation of plans and specifications and their use in the building operation, irrespective of whether he superintended the work or not.

I WAS called up recently by another lawyer, who was interested in a case where an attempt was being made to induce the court to accept a still more liberal interpretation of the New York Lien Law and to allow an architect to enforce a lien where he had prepared plans and specifications, but where the building operation had not been proceeded with. I advised the attorney who consulted me that while the case was apparently one without exact precedent in this state, it seemed entirely clear that the architect could not maintain a lien under such circumstances. As I have noted above, the theory on which a lien is based is that the work done enters into the improvement of the property. Manifestly, unless the building for which the plans are prepared is erected, the property is not improved. No amount of work done by the architect in preparing the plans and specifications will alter this fact or enhance the property, as property, a single dollar, unless the plans and specifications are actually utilized in the erection of a building upon the property.

MECHANICS' liens were not known at common law, and are purely the result of statute. The legislature might, if it desired, so word the statute that an architect preparing plans and specifications for a particular piece of property, should be entitled to a lien, even though no building were erected on the property. Such a law would, however, be at variance with the theory and practice of lien legislation as it has been developed abroad and in this country. In any event, neither the New York Statute, nor so far as I know, any other lien statute has ever gone to this length. The case to which I have referred came on for trial shortly after I was asked about it, and the trial judge dismissed the case and held, as it had seemed he must, that no lien could be enforced in New York under such circumstances.

Of course, the fact that a lien will not be granted does not mean that the architect cannot collect for the work done on the plans and specifications in such a case. If his agreement with his client is in proper form, or if he has no agreement and has not otherwise committed himself, he is entitled to collect the agreed or reasonable value of the services rendered, entirely irrespective of his right to enforce a lien for this amount. The two rights—the right to receive pay for his services; and the right to file a lien for the amount due therefor—are entirely separate and distinct, but it may very well be that he can collect the amount due him by suit and yet not be able to sustain a lien based on the same services for which the collection is made. If he can enforce a lien he can, on the same facts, succeed in an ordinary direct suit for the amount due.

The architect must not forget, also, that the lien laws of the different states vary greatly and that each is construed according to its particular phraseology. Many are not as liberal as the present New York law. Many are more liberal in some respects and more limited in others. If lien protection is sought the architect must, accordingly, be sure of his ground and not proceed without proper advice and guidance. It is a rather safe general rule, however, that, where the enforcement of a lien is sought, the more progress that is made on the building operation and the more superintendence that is given by the architect, the better will be the latter's chances as a lienor.

# LEGAL DECISIONS

THE general contractor sued a sub-contractor to recover an alleged overpayment. The sub-contractor defended the suit on the ground that there was in fact a balance due him from the contractor, but he did not set up any formal counterclaim or demand any affirmative judgment against the contractor for the balance due. The verdict was in favor of the sub-contractor, dismissing the contractor's claim. Later, the sub-contractor took lien proceedings against the property and the owner. The owner claimed that the sub-contractor was stopped from taking this action, because he had set up the balance due from the contractor in the suit between the contractor and himself. The Court held that the sub-contractor was not so stopped; that he had the right to prove as he did in the suit by the contractor merely that there was nothing due from him to the contractor, without asking for the judgment in his favor against the contractor; that the first suit was simply a personal matter between the contractor and the sub-contractor, while the second was a proceeding to enforce a lien against the land; that the two actions were not identical in subject matter, and the first action was therefore no bar to the recovery of the sub-contractor under his lien rights.

*Ott v. Duplan Silk Corporation (Pennsylvania)*, 114 Atlantic 630.

THE sub-contractor sued the general contractor for a balance which he alleged to be due. The contract which the general contractor had taken amounted to $800,000. The general contractor had paid to the sub-contractor a large sum of money and insisted that this was all that was due. The plaintiff, the sub-contractor, within a few hours thereafter, stopped all work and abandoned his contract, claiming that the amount paid was not the full amount due. The defendant, the general contractor, notified the plaintiff that he was prepared to pay at once any sum shown to be properly due. This was within six days from the time that the sub-contractor quit. The sub-contractor refused to submit any details of his demand or any statement for verification by the contractor. It was held that if the general contractor substantially complied with the contract with the sub-contractor and paid in good faith the sum which he believed to be due, the sub-contractor was not justified under the facts in the case in abandoning the job, notwithstanding the general rule would be that where a job is spread over a period of considerable time and when the payments to the sub-contractor are based on the amount of work performed, the covenant to perform is dependent upon the covenant to pay and a refusal to pay amounts due might justify a recission of the contract; that the question whether in this case the offer of the general contractor to pay, upon proper proof of the balance alleged to be due, was reasonable was properly left to the jury; that the right of a sub-contractor in such circumstances to rescind will be upheld only where the general contractor is given a reasonable time within which to comply with demands for payment, and that the abandoning of the work in the present case by the sub-contractor was not justifiable.

*Turner etc. Co. v. Chester etc. Co. (Pennsylvania)* 114 *Atlantic* 780.

THE defendant purchased a lot in the City of Newark. His deed provided that he should be restricted to the erection of a two-family house, which should look like a one-family house. There existed a community scheme of development in the area in which his lot was situated, which restricted the houses to be erected in that area to one-family houses. He had no actual notice of this scheme beyond the statement in his deed. The deeds to the other owners in the same area, however, all contained restrictions limiting the building of houses to one-family houses. All of the houses within the restricted area were one-family houses of a general uniformity of construction. The houses on the plot just north of the restricted area and adjoining which and on the south of which defendant's lot was located were all two-family houses. The defendant inquired of the grantor who sold him the lot and the City authorities, who said he might erect a two-family house. As he was proceeding with the erection of a two-family house, the plaintiff brought an injunction to restrain him from so doing. The Court held that it was the defendant's duty, upon observing the uniform character of the houses in the neighborhood and their difference from those immediately north, to inform himself as to the reason why the houses in the area were all one-family houses, by inquiring in the immediate vicinity, especially in view of the fact that his own deed gave him notice that there were some restrictions. It was further held that covenants such as those in this case restricting the houses to be erected in a given area to one-family houses constituted a general neighborhood or community scheme, and that the regulations covering this scheme must be observed by a lot owner, if he had notice thereof at the time he purchased his lot. or, if, as in this case. he was put on his guard and reasonable inquiry would have given him the requisite knowledge.

*Shoyer v. Mermelstein, (New Jersey)*, 114 *Atlantic* 788.

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## DESIGNING REINFORCED CONCRETE COLUMNS

### A few essential principles governing the use of concrete and steel in combination

A VERTICAL steel rod embedded in concrete forms a column in which the two materials act together until the stress becomes great enough to strip the concrete from the steel. Tests to destruction of reinforced concrete columns prove the foregoing statement to be true, within limits.

Take a piece of steel of unit area and a piece of concrete of the same area and load them equally. The concrete will shorten to a much greater degree than the steel and the difference in a unit length will be the "ratio of deformation" between the two materials. For a concrete composed of one part of Portland cement, two parts of fine aggregate and four parts of coarse aggregate the ratio of deformation is usually taken as equal to 15. This is but another way of saying the concrete will be reduced in length 15 times more than the steel, assuming each to be of the same area and the load on each to be equal and centrally applied.

Let $f$ = the average fiber stress per unit of area of the horizontal section of a column

$f_c$ = the safe unit stress on the concrete alone

$n$ = the ratio of deformation

$A_c$ = the cross sectional area of the concrete alone

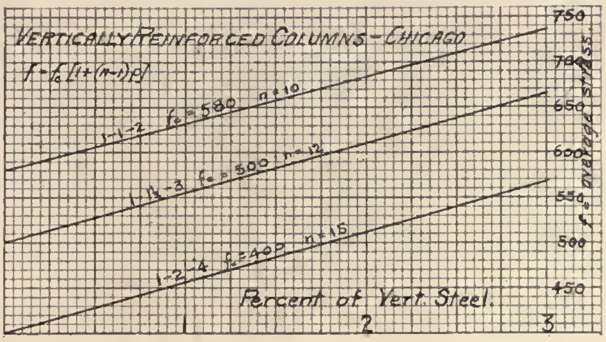
$A_s$ = the cross sectional area of the steel

$A$ = the total area = $A_c + A_s$ then

$P = fA$ = total load on the column, and

$$f = f_c (A_c + nA_s) \qquad (1)$$

The safe concrete stress is the governing factor and the steel may be stressed $n$ times the concrete stress, but no more. Steel may be used with a very high stress in a structural steel column but when used in combination with concrete the stress is kept low. For example the unit stress in a structural steel column may be as high as 14000 lb. per sq. in. but if the same steel is used with a concrete in which the safe stress is limited to 400 lb. per sq. in., the steel stress cannot exceed 15 x 400 = 6000 lb. per sq. in. If a higher stress is used the concrete will be stressed more than $n$ times the safe stress and will be stripped from the steel. When this occurs the two materials will begin to act separately.




A straight-line diagram for designing ordinary reinforced concrete columns

Considering the matter from another angle we may say that the total area is increased by $n - 1$ times the area of the steel. This means that since the steel occupies a definite area then $n$ times the steel area gives too great an increase, so the difference is made by subtracting $1$ from $n$. This permits us to express the relation in ratios of area.

Let $p$ = ratio of steel area to total area, then

$$P = f_c A\,[1 + (n-1)\,p] \qquad (2)$$

The diagram here presented was prepared for the design of longitudinally reinforced concrete columns in Chicago. There the safe compressive fiber stress on 1-2-4 concrete in this type of column is 400 lb. per sq. in. and $n = 15$; on 1 – 1 1/2 – 3 concrete the stress may be 500 lb. per sq. in. with $n = 12$; for 1 – 1 – 2 concrete the stress may be 580 lb. per sq. in. with $n = 10$.

The total cross-sectional area of the reinforcing steel cannot be less than one-half of one per cent nor less than one square inch and no rod or bar can be used having a diameter or thickness of less than one-half inch. The maximum amount of vertical steel is limited to three per cent. Horizontal ties to prevent lateral outward flexure of the steel must be used at intervals not greater than twelve times the least diameter or thickness of the vertical steel reinforcement and not exceeding 18 inches.

The preparation of such a diagram is simple for the formula is of the straight line type. In formula (2) let $P = f$ and $A = 1$. The expression then appears as follows;

$$f = f_c\,[1 + (n - 1)\,p] \qquad (3)$$

For the 400 lb. concrete $n - 1 = 14$; for the 500 lb. concrete $n - 1 = 11$ and for the 600 lb. concrete $n - 1 = 9$.

Draw the vertical lines representing the steel ratio and the horizontal lines representing the average stress. From zero reinforcement draw the diagonal lines representing the stress in the concrete. Plot the average stress on the three per cent vertical line and obtain the following values; 400 lb. concrete = 400 x 1.42 = 568 lb.; 500 lb. concrete = 500 x 1.33 = 665 lb. and for the 580 lb. concrete, 580 x 1.27 = 736.6 lb.

The cross-section of the column cannot be less than 64 inches and the ratio of length to the least side or diameter cannot exceed twelve. Usually this may be interpreted to mean the external dimensions of the column, in which case the concrete used for fire protection cannot be counted upon for strength. If the column is supposed to be fireproof there must be a covering of not less than two inches over the steel. To dimension the column assume a diameter, or least dimension, equal to one-twelfth the clear height. From this deduct four inches and the remainder will be the actual column size which cannot be less than 8 in. Divide the total load to be carried by the area of the column and obtain the stress per square inch. On the diagram find this stress and follow it horizontally to a sloping line indicating the concrete stress. The intersection of the horizontal and a sloping line determines the amount of vertical reinforcement to be used. When the average stress is high enough to intersect two sloping lines a choice may be made of either concrete. It is then a question of using a rich concrete with a small amount of steel or a leaner concrete with more steel.

For hooped columns, which are columns having spiral steel around vertical steel, the 1-2-4 concrete may be stressed to 500 lb. per sq. in.; the 1 – 1 1/2 – 3 concrete to 600 lb. per sq. in. and the 1 – 1 – 2 concrete to 725 lb. per sq. in. The hooping steel is expressed in terms of vertical steel and is assumed to be 2.5 times as effective in the form of hooping as it would be if used in the form of vertical steel.

Let $p'$ = vertical equivalent of spiral steel, then

$$f = f_c\,[1 + 2.5np']\;[1 - p' + (n - 1)p] \qquad (4)$$

The diagrams for hooped columns were constructed by means of formula (4) as described for the first diagram. In spirally reinforced, or hooped columns, the vertical reinforcement cannot be less than the spiral reinforcement, nor greater than eight per cent of the area within the vertical steel. The percentage of spiral hooping cannot be less than one-half of one per cent nor greater than one and one-half per cent. The spiral hooping must have a uniform pitch not greater than one-tenth of the diameter of the column and not greater than three inches. The spiral must be attached to each vertical at every intersection in such a manner as to maintain the form and position of the steel. There must be not less than eight verticals and the distance between verticals, measured on the circumference of the hooping cannot exceed nine inches.

The diameter of a round column and the dimensions of a rectangular, or octagonal column, must be measured to the outer face of the steel. No concrete outside of the steel is to be considered as a part of the effective column section. The concrete outside the steel does actually carry a large part of the load until a fire damages it. It must however be considered as fireproofing only.

In some building ordinances the ratio of length to least diameter may be 15, instead of 12 as in Chicago, and this ratio is recommended in the Joint Committee Report. The ratio required in Chicago is too conservative if used for the effective column size. When the ratio of 15 is used it is usually assumed to apply to the effective area within the steel.

In the city of Los Angeles reinforced concrete columns may be used with an unsupported length equal to 30 times the least dimension or diameter of the effective section.

Let $f_c$ = concrete fiber stress for column with diameter 1/15 the unsupported length

and $rf_c$ = concrete stress for a column with diameter less than 1/15 the unsupported length

$$r = 1.6 - 1/25\left(\frac{l}{d}\right) \qquad (5)$$

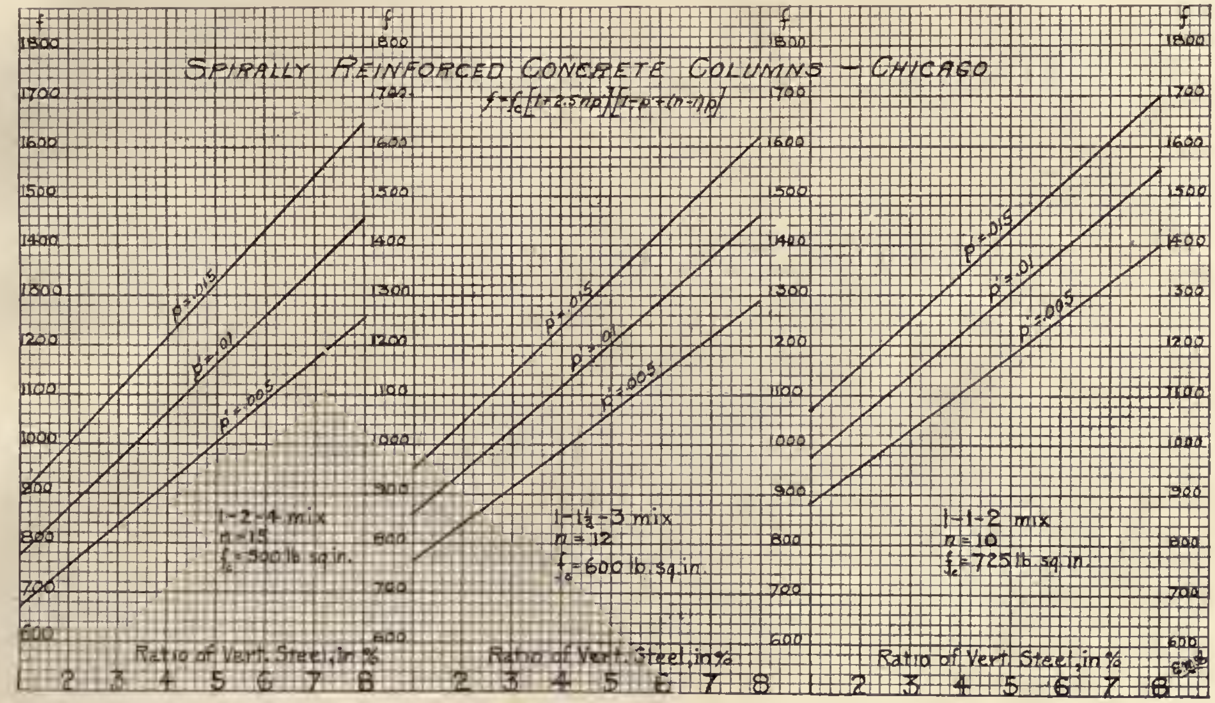
in which $l$ = the unsupported length

$d$ = diameter or least dimension.

Some years ago a number of buildings were designed in which the reinforcement for the columns was in structural shapes, instead of being in rods or bars. The steel was designed to carry the dead load and the concrete when added was assumed to carry part of the live load. The assumptions were not correct, for concrete and steel do not act well together when the steel is in large sections. The surfaces are too large for the concrete to adhere properly. In the hope that the two materials might act together properly the specifications provided that all the dead load should be in place before pouring the concrete. For a time designers took favorably to this idea but it was discovered in a number of cases that the loads placed on the framework of a building during construction often exceeded those for which the framing was designed. This being the case the reinforcement if in the form of structural shapes had really to be designed for the full dead and live loads, thus again reducing the role of the concrete to that of mere fireproofing.

When the vertical reinforcement in a reinforced concrete column consists of a structural steel column of box shape, with lattice or batten plates of such a form as to permit its being filled with concrete, the concrete may be stressed as high as concrete in hooped columns, provided that no shape of less than one square inch section be used and that the spacing of the lacing or battens be not greater than the least width of the columns. This provision takes care of types of reinforced concrete in which the steel is designed to carry all the dead load and the concrete assists in carrying the live load.

The New York Building Code contains a provision permitting the use of a fiber stress of 16000




A straight-line diagram for designing hooped columns

The fad lasted long enough however to result in many cities providing for this form of construction in their building laws. In Chicago the effect of stiffening a steel column by filling it with concrete is recognized, but such a column is not called a reinforced concrete column. When a steel column is designed to carry the entire live and dead load the allowable stress is determined by the following formula,

$$18000 - 70\frac{l}{r} \qquad (6)$$

with a maximum stress of 16000 lb. per sq. in. provided the column is filled with concrete and is protected by concrete which extends three inches beyond the face of the steel. When this outer covering of concrete is omitted the above formula is used but the allowable stress shall not exceed 14000 lb. per sq. in.

lbs. on structural steel shapes provided additional reinforcement is added in the form of vertical bars and bands, in quantity amounting to one per cent of the total area of the enclosed concrete. The reinforcement to be divided half in vertical bars and half in bands.

The principle underlying this idea is that experiments show the concrete is strengthened when held in place by bands or hooping. For example, in Chicago the safe unit stress in concrete reinforced with vertical steel is one-fifth the ultimate strength but when hooping is used the safe unit stress may be one-fourth the ultimate and the steel used as hooping is considered to be two-and-one-half times as effective as the steel placed vertically. The New York Code therefore assumes that when the concrete is enclosed within bands and reinforced also with vertical steel that the strength thus increased may be added to the strength of the structural steel. This provision is typical of the kind that were introduced into building ordinances when men had a poorer understanding of the basic principles of reinforced concrete than they have today. At the time there were men who knew better but they did not exercise enough influence in the preparation of building ordinances.

To show how this might work out in case a designer cared to press the point, take two columns to carry the same load, one being an 8-in. H column and the other a 6-in. H column, the cross sectional area of the columns being equal. The first column having a larger radius of gyration is naturally the better column. When used as permitted in the code, the amount of reinforcing steel being based on the area of the concrete within the bands, the 8-in. column being larger and surrounded by a greater area of concrete must be more heavily reinforced than the 6-in. column. The *reductio ad absurdum* method of demonstration in this instance would work out better were a 4-in. H used instead of a 6-in.

The use of the diagrams was illustrated by assuming the columns to be limited in size by the ratio of length to diameter or least dimension. In the lower floors of high, or heavily loaded buildings the column size can only be limited by using a strong concrete and considerable steel. Even then it happens that the sizes are objectionable and in many buildings structural steel columns are used in the lower stories and reinforced concrete columns in the upper stories. Using the formula permitted in Chicago the structural steel columns may be filled with concrete and higher stresses be used than are permitted with columns not stiffened in this manner. Such columns are not however reinforced concrete columns but are merely stiffened steel columns. The reduction in size is generally quite satisfactory and permits the use of the more economical reinforced concrete column on floors where the ratio of length to diameter is not objectionable.

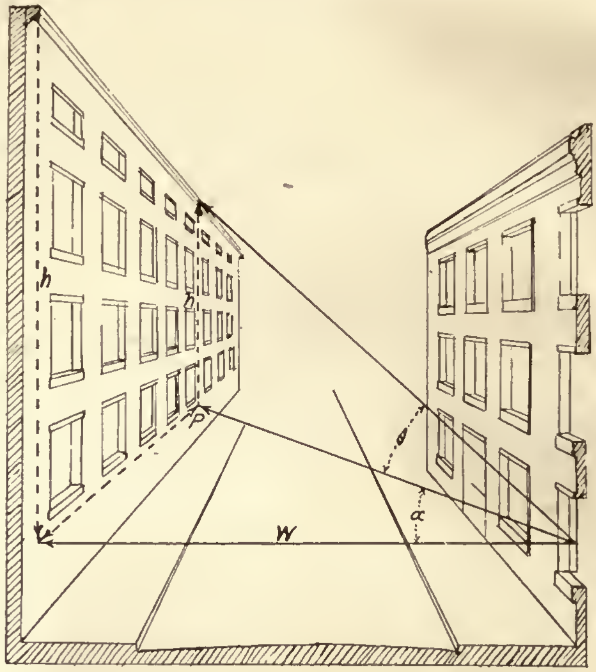
The concrete filled steel pipe is a type of column for which formula (6) is used with a maximum stress of 14000 lb. per sq. in., for the outer shell of concrete is fireproofing completely detached from the concrete in the core.

Hollow cast iron cores filled with concrete and surrounded by a spirally reinforced shell of concrete form another type of stiffened columns. The ratio of deformation between cast iron and concrete is smaller than that between steel and concrete, ranging from 4 to 6 for cast iron whereas it ranges from 10 to 15 for steel. The strength ratio is also smaller. A combination of the two materials permits the use of high stresses in both and is thus economical, provided cast iron may be purchased at a satisfactory price in competition with steel.

## Sky Brightness

THE brightness of the sky was measured almost daily at the American University, Washington, D. C., between April 5 and July 14, inclusive, and at Chicago, Ill., between July 19 and August 13, inclusive, 1921.

About half the Chicago measurements were made on top of the dome of the Federal Building, in the Loop district, one of the smokiest sections of the city. The remainder were made at the University of Chicago, which in summer is comparatively free from smoke when the wind




A diagram illustrating the formula used to determine the shading effect of buildings and other objects

blows from the lake. South East and South West winds, however, bring considerable smoke from South Chicago and the Union Stock Yards, respectively. There is little smoke in the atmosphere at the American University, D. C.

A comparison of the Washington and Chicago measurements shows that toward the sun on cloudless days the sky brightness does not differ materially at the two places, but opposite the sun the horizon in Chicago is darkened by the smoke, especially in the Loop district.

With a cloudless sky the direct solar illumination in Chicago is noticeably weaker than at Washington, and in the Loop district, with the sun not more than 40 deg. above the horizon, it averages 80 per cent as intense. The illumination on a vertical surface facing 180 deg. in azimuth from the sun, computed from the sky brightness measurements, averages only about two-thirds as intense as the illumination computed from similar measurements for Washington.

With the data obtained it becomes possible to compute the illumination resulting from the sky brightness on a horizontal surface and on vertical surfaces facing the selected points on the horizon.

The following expression is used to determine the shading effect of buildings and other objects on the opposite side of a street:

$$Tan\ \theta = \frac{h}{w}\sqrt{\frac{1}{1 + tan^2\ a}}$$

in which $w$ = the width of the clear street space,

$h$ = the height to which opposite buildings, or objects, extend above the center of a window that is under consideration,

$a$ = the angle between a line normal to the window surface and a horizontal line to a point $p$ on the row of buildings,

$\theta$ = the angular height of the building above the point $p$, as seen from the center of the window.

Let $h=2w$, $w$, and $1/2w$, respectively, and let the row of buildings be of infinite length. We obtain the following relations between $a$ and $\theta$

| | $a=$ | 0° | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $h/w=2$ | $\theta=$ | 63.4° | 63.1° | 62.0° | 60.0° | 56.9° | 52.1° | 45.0° | 34.4° | 19.1° | 0.0° |
| $h/w=1$ | $\theta=$ | 45.0° | 44.6° | 43.3° | 40.9° | 37.5° | 32.7° | 26.6° | 18.9° | 9.8° | 0.0° |
| $h/w=\frac{1}{2}$ | $\theta=$ | 26.6° | 26.2° | 25.2° | 23.4° | 21.0° | 17.8° | 14.0° | 9.7° | 5.0° | 0.0° |

The foregoing is from a recent publication issued by the Weather Bureau in the U. S. Department of Agriculture, which contains reprints from the *Monthly Weather Review*, September, 1921, 49: pp. 181-488.

The utility of measurements and computations such as are described in the publication is shown by a reference to recent studies in relation to electric lighting current requirements. The publication is one of considerable value and contains a promise of further investigations taking into account reflection of light from ground surfaces and from walls of buildings and other objects.

## Standardization

THE Secretary of War has directed that: "The Supply Branches of the Army utilize in connection with their specifications the standards that have been or may be adopted by the American Engineering Standards Committee."

## National Building Code

THE Building Code Committee of the Department of Commerce is at present preparing suggestions for minimum requirements for small houses and expects soon to issue a preliminary report.

## Fire Tests of Brick Walls

IN the 1921 Report of the Director of the Bureau of Standards it is stated that tests of brick-wall panels, 11 feet high and 16 feet wide, are being made in the Bureau's testing furnace at Washington. This is the initial series of a number that it is proposed to carry out with this equipment, the intention being to include all the wall and partition materials in common use. It was deemed advisable to introduce the tests with brick first, because brick is a primary building material that has been in long and universal use, and the values obtained with each thickness can be used as a standard of comparison in interpreting the results with other materials. There is at present much demand for information on the fire values and stability under fire conditions of brick walls. Opinion as reflected in building ordinances varies greatly relative to wall thickness requirements, and while this is due in part to considerations other than those relating to fire, it is thought that a properly planned series of fire tests will help materially to determine the minimum thickness safe for use.

The panels are built by a masonry contractor at a fixed price per panel, as determined by competitive bids. The series will include tests with brick made of two types of surface clay and one shale, and also with sand-lime and Portland cement brick. Studies will be made on the effect of changing the cement and lime content of the mortar. The panels are either built solidly into their containing frames to approximate conditions of restraint sometimes present in practice, or they are built free from the sides and top of the frame, some with stiffening pilasters at the ends to simulate conditions of use in the upper stories of some buildings. Heat is applied to one side of the panel, using fuel oil atomized by jets of steam or compressed air, and temperatures are measured at a number of points in the furnace as well as on the exposed and unexposed faces of the panel and at intermediate points within it. The relative deflections of panel and restraining frame are measured, as also the deflections of the restraining frame itself. The fire test is continued for six hours, provided failure does not occur earlier. Water will be applied in some of the tests after a one-hour fire exposure.

The series will consist of about 25 tests of 8-inch and 12-inch brick walls of the solid and of the hollow type, of which 9 tests have been completed. During 1920 the equipment was tested out, and some changes deemed necessary were made. Two preliminary tests were made of wood stud and plaster on metal-lath partitions. The work with the brick panels was done during the last five months of the fiscal year. While too early as yet to give definite conclusions, the tests indicate that within limits as to height the 12-

inch wall is a stable and effective fire barrier. Relative to the 8-inch wall, less definite statements can be made, although under limitations as to exposure, height of wall, and lateral support, which it is proposed to establish in this and related investigations, the safe use of the 8-inch wall may possibly become adequately defined.

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### Retardant Fire Construction

THE following items of interest to architects have been culled from the 1921 Report of the Retardant Division, Protection Department, in the Underwriters' Laboratories:

In window construction the tendency among the manufacturers of hollow metal windows appears to be towards the construction of a heavier window, with a view to increasing the durability. These windows are generally spoken of as steel plate windows to distinguish them from the sheet metal windows on the one hand and the solid section windows on the other. It is possible that the Laboratories will conclude to adopt this designation.

During the year the Laboratories have tested one hollow metal door designed for use in passenger elevators. Report on this door has not as yet been forwarded to the Council. It is considered worthy of comment only because horizontally sliding passenger elevator doors have never before been submitted for test and the study of the device brings up some unusual features.

Judging from the character of roof coverings submitted, the tendency appears to be towards the use of asphalt saturated rag felt shingles in place of the old roll roofing. This indicates a decided advance in the fire protection afforded as well as in the durability of the covering used, as shingles have at least twice as great a thickness when laid as the old roll roofing and are uniformly coated with an inert surfacing such as gravel, slate or materials of like character. In addition two manufacturers are developing an asbestos felt shingle, which, under test, gives much better results than the rag felt shingle.

It is expected that before long the Laboratories will issue reports on some of the usual forms of wall constructions, classifying these constructions in accordance with the new fire resistance classification—that is, a certain type of wall will be classified as a "R 1 hr., R 2 hr., R 3 hr. wall" etc. It is expected that ultimately all retardants will be given this classification, and it is felt that when this is finally incorporated as a part of the regular procedure on these devices, the Laboratories' reports will be much more used by rating bureaus.

### Elevator Interlocks

TECHNOLOGIC Paper No. 202 of the Bureau of Standards gives the results of a field survey of several thousand elevator landings equipped with various types of mechanical and electro-mechanical interlocks and contact devices. The work was done in co-operation with the American Society of Mechanical Engineers. The statistics show that 73.8 per cent of all fatal accidents might be prevented by well-designed interlocks.

The following definitions and specifications are submitted as tentative suggestions suitable for inclusion in an elevator code and are intended to give adequate protection and to mitigate the hazards previously set forth. From the evidence thus far accumulated the use of a hoistway-door interlock seems advisable, and this protection should be required on passenger elevators at least.

#### 1. Definitions

*Hoistway-Door Interlock.*—A hoistway-door interlock is a device the purpose of which is—

1. To prevent the normal operation of the car, except by the use of a leveling device, unless (*a*) (door unit system) the hoistway door opposite which the car is standing is locked in the closed position; or (*b*) (hoistway unit system) every hoistway door is locked in the closed position.

A hoistway door or gate shall be considered locked in the closed position when within 4 inches of the full closure. If in this position, and any other up to full closure, the door or gate cannot be opened from the landing side more than 4 inches.

Interlocks which permit the starting of the car before the door is fully closed shall be so equipped that except when the door is locked in the position of full closure the door or gate can be opened from the landing side to the position approximately 4 inches from full closure.

2. To prevent the opening of a hoistway door (except by use of a key) from the landing side when the car is passing a landing; except when the car-control mechanism is in the "stop" position.

*Hoistway-Door Electric Contact.*—A hoistway-door electric contact is an electrical device the purpose of which is to prevent the normal operation of the car except by the use of a leveling device unless (*a*) (door unit system) the hoistway door opposite which the car is standing is in the closed position, or (*b*) (hoistway unit system) every hoistway door is in the closed position.

*Emergency Release.*—An emergency release is a device the purpose of which is to make hoistway-door electric contacts or hoistway-door interlocks inoperative.

2. Specifications

*Hoistway-Door Interlock Specifications.*—(*a*) The prevention of the operation of the car by a hoistway-door interlock shall not be dependent on the action of springs in tension nor solely upon the completion or maintenance of one electrical circuit.

(*b*) The agency used to perform any interlocking function shall be such that even without lubrication of the mechanism the intended functioning of the device will be completely performed.

(*c*) The locking of the hoistway door and the interlocking of the car control shall be accomplished by an interconnection between the parts of the device. This interconnection may be mechanical, electrical, hydraulic, or pneumatic.

(*d*) It shall be necessary to accomplish the locking of the hoistway door opposite which the car is standing before the car can be moved by normal operation.

This paragraph applies to both the door unit and the hoistway unit system.

(*e*) If without damage to, removal of, or interference with any part of the elevator or hoistway equipment the door opposite which the car is standing becomes unlocked, it shall be impossible to start the car by normal operation.

*Hoistway-Door Electric Contact Specifications.*—(*a*) The prevention of the operation of the car by an electric contact shall not be dependent on the action of springs in tension nor solely upon the completion or maintenance of one electric circuit. The failure of the device shall manifest itself by preventing the starting of the elevator from the landing.

(*b*) The device shall be such that without lubrication of the mechanism the intended functioning will be completely performed.

(*c*) All live parts shall be inclosed.

*Emergency Release.*—(*a*) The emergency release shall be in the elevator car, plainly visible to the occupants and reasonably, but not easily, accessible to the operator.

(*b*) To operate under emergency conditions, it shall be necessary for the operator to hold the emergency release in the emergency position. The emergency release shall be so constructed and installed that it cannot be readily tampered with or "plugged" in the emergency position.

(*c*) Rods, connections, and wiring used in the operation of the emergency release that are accessible from the car shall be inclosed to prevent their being tampered with readily.

## Steel Sash for Cellars

A CELLAR window in steel is now on the market. The makers claim that it will be sold to compete in cost with wood frame and sash.

## Hollow Tile Investigation

THROUGH a co-operative arrangement with the Hollow Building Tile Association the Bureau of Standards is making an investigation on the fire-resistive and related properties of hollow-clay tile. Clay and hollow tile, representative of the types generally used, are made into specimens for tension, transverse, compression, absorption, freezing, vitrification, fusion, and fire tests. For the latter a gas-fired furnace was built in the ceramic laboratory of the Bureau to accommodate panels up to 3 feet wide and 5 feet high and subject them to working load during the fire test. The panel at present used is 1 foot wide and consists of 8-inch double-cell tile, with which 26 fire tests have been made, the results of which are chiefly of value for comparing the fire-resistive properties of tile made from different clays and in different forms. It is proposed to study the effect on fire-resistive properties of ground-burnt clay (grog) additions to the raw clay in molding; also of burning to different degrees of hardness.

The auxiliary tests indicate large variability in strength and elastic properties, and as yet no definite relation has been established between absorption and compressive strength.

## Specification for Interior Varnish

THE Interdepartmental Committee on Paint Specification Standardization presented a recommended specification for interior varnish in Sept. 1921. The following general clauses are given:

The varnish shall be suitable for general interior use, including both rubbed and unrubbed finish, exclusive of floors. It must be capable of easy application with a brush in the ordinary manner according to the rules of good standard practice, must flow out to a good level coat free from runs, sags, pits, or other defects, and dry with reasonable promptness to a hard, somewhat elastic glossy coating which can be rubbed in 48 hours or less. The manufacturer is given wide latitude in the selection of raw materials and processes of manufacture, so that he may produce a varnish of the highest quality. The varnish must meet the following requirements:

*Appearance.*—Clear and transparent.

*Color.*—Not darker than a solution of 3 g of potassium dichromate in 100 cc of pure sulphuric acid, specific gravity 1.84.

*Flash Point (closed-cup).*—Not below 30° C (85° F.).

*Nonvolatile Matter.*—Not less than 45 per cent by weight.

*Set to Touch.*—In not more than 4 hours.

*Dry Hard.*—In not more than 24 hours.

*Dry to Rub.*—In not more than 48 hours.

*Toughness.*—Film on metal must stand rapid bending over a rod 3 mm (1/8 inch) in diameter.

*Working Properties.*—Must have good brushing, flowing, covering, leveling, and rubbing properties; and must show no impairment of luster or other defect when used where natural or illuminating gases are burned or when subjected to air currents during the process of drying or application.

*Water Resistance.*—The dried film must stand application of cold water for not less than 18 hours without whitening or showing other visible defect.

The complete specification, together with detailed description of methods of testing, is contained in Circular No. 17, Bureau of Standards. Copies may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents per copy.

### Free Technical Service

THE Research Information Service of the National Research Council, Washington, D. C., announces that it will endeavor to furnish ascertainable information on scientific problems, technical processes, laboratory methods, researches in progress, publications, bibliographies of special subjects, etc.

No charge is made for such information; but where prolonged searches or photostat copies are necessary, these may be charged for at cost after agreement with the inquirer.

### Research Graduate Assistants

TO assist in the conduct of engineering research and to extend and strengthen the field of its graduate work in engineering, the University of Illinois maintains fourteen Research Graduate Assistantships in the Engineering Experiment Station. Two other such assistantships have been established under the patronage of the Illinois Gas Association.

These assistantships, for each of which there is an annual stipend of $600 and freedom from all fees except the matriculation and diploma fees, are open to graduates of approved American and foreign universities and technical schools who are prepared to undertake graduate study in engineering, physics, or applied chemistry.

An appointment to the position of Research Graduate Assistant is made and must be accepted for two consecutive collegiate years, at the expiration of which period, if all requirements have been met, the degree of Master of Science will be conferred. Not more than half of the time of a Research Graduate Assistant is required in connection with the work of the department to which he is assigned, the remainder being available for graduate study.

There will be ten vacancies to fill. Applications for appointments to these positions should be received by the Director of the Engineering Experiment Station by March 1, 1922, on blanks which will be supplied on request.

### New Chimney Ordinance

THE National Board of Fire Underwriters, 76 William Street, New York City, announces that the revised chimney ordinance is ready for distribution. It is probably the most complete ordinance of its kind ever published and bears the endorsement of twelve large national organizations associated with the building industry. It is stated that in a recent year 12.4% of all dwelling house fire damage was found to be chargeable to defective chimneys and flues, and this figure represented 66.6% of the losses in all occupancies from this cause. The importance of properly built chimneys is evident.

### Structure of Metals

CIRCULAR No. 113 of the Bureau of Standards is entitled "Structure and Related Properties of Metals." It contains 104 pages and is well illustrated. Copies may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents per copy.

### Standards in the Pump Industry

YEARS of study and research are reflected in a booklet entitled:—"Trade Standards in the Pump Industry," that has just been published by The Hydraulic Society.

The work explains trade names and defines trade and hydraulic terms. Recommendations and suggestions are given as a guide for buyers and specification writers. It is believed that the booklet will eventually be looked upon as a standard like the national engineering society standards. Copies may be obtained free on request from the Secretary of the Hydraulic Society, C. H. Rohrbach, 50 Church Street, New York, N. Y.

### A Correction

MR. John T. Comes, Architect, Pittsburgh, Pa., asks that an error, in the article on "The Illumination of Churches" by Mr. Harold W. Rambusch in the January 18 issue, be corrected.

On page 75 Mr. Comes was given credit for St. Mary's Church, Johnstown, Pa. This was an error as Mr. Comes designed only the decorations for this building.—EDITORS.

# DEPARTMENT OF SPECIFICATIONS

FOR the construction of heavy spread footings of concrete for piers, columns or foundation walls forms may or may not be required, the desideratum being the nature of the soil and the depths of the footings. Even those cases that seem to preclude the building of forms for concrete may require their construction in order that none of the surrounding soil may fall into the wet concrete.

Previous articles have contained discussions of pile and caisson specifications and it will, then, be understood that the foundations mentioned in this and subsequent articles will be ordinary mass foundations, either plain or reinforced.

Since general excavations will not include the removal of earth from footing and foundation wall sites—being included in the class of trim or finished excavation work as distinguished from steam shovel or other methods of soil removal in mass—it will be necessary to require that the contractor for foundation work will do all trimming of excavations as left by others and do all excavation work for footings and foundations as required for the correct installation of his work. Excavations must, in all cases, extend to good bearing soil.

Provisions also must be made for the furnishing, by the contractor, of experienced surveyor's services for the correct establishment of the lines and grades that must be followed in the construction of the foundations. If grades or lines have been established on benches by previous contracters, such work must be checked very carefully so that any errors that have occurred may be corrected immediately.

If no previous soil explorations have been made and if more accurate information is desired and the gaining of it is not provided elsewhere, the foundation specifications must provide for borings for certain particular footings or for all of them. Previous articles in this department have treated of this subject and the reader is referred to them for detail information on these points.

Forms for concrete may be of wood or steel (except in those cases where the bank of excavation is used as a form), the choice sometimes being made in the specifications while otherwise the contractor is given the opportunity to use whichever material he desires. The use of steel forms is becoming more common and since it produces a smooth finish, which is quite desirable for foundation walls, its more frequent use cannot be too strongly commended.

Foundation wall forms that are to be placed adjacent to earth banks restrained by sheet tiling must be built around the shores or else the shoring must be so designed that a short height of wall may be built, the shores re-arranged after this concrete has hardened sufficiently to receive the thrusts that will come upon it and the wall then carried to completion in a sectional manner. If waterproofing of the foundations is not required and the shores are not too complicated or too numerous, there is no objection to pouring concrete around them, the hole thus left (upon removal of shores) to be filled in with concrete later. But if waterproofing is required this method should not be used, the specifications requiring that shores be placed so as not to leave holes in walls and further requiring that the foundation contractor refuse to pour concrete in walls where shores will leave openings detrimental to the concrete work.

The specifications for foundation wall forms also must require bracing of exterior retaining walls of such a character that they will be held in their correct position. This is especially necessary where it is believed that no special precautions, such as the installation of sheet piling, will be required to hold the banks. Heavy rains may alter what one's judgment indicates will be a substantial earth bank.

Other points in respect to forms for foundation walls will be treated in the next issue of this paper in connection with general specifications for structural concrete work, of which the foundations really are a part.

ALTHOUGH poured concrete is becoming almost universal in its application to foundation construction, the fact remains that other materials are still in use for foundations. Among these will be found rubble stone, brick, concrete blocks and clay tile of varying kinds. Since the choice of materials for foundations does not always lie with the specification writer it seems well to include in this discussion these alternative materials.

Rubble stone as used here must not be understood to mean any particular kind of stone but, rather, the manner of laying it, as is commonly understood. With few exceptions any stone that is used locally for foundation work will be a good stone. It must be sufficiently hard to give an ample factor of safety for crushing strength and it should be susceptible to smooth dressing for exposed surfaces, unless a rock surface of extremely irregular projections is more desirable from an esthetic standpoint.

If footings are to be of stone the pieces should be of large dimension so as to eliminate small pieces of two square feet or less in area. As a matter of fact, unless the design demands otherwise, the larger the stones are the better will the wall be built.

Before laying stones in the wall they should be moistened with water in dry weather or left dry in freezing weather as is customary with materials of similar character. The mortar for laying this stone work should be a cement mortar with lime gauging of a small amount to fatten it. The ends of stones should be dressed at right angles to the faces or at an acute angle of not much greater than forty-five degrees, so that a filling piece may be placed in the joint without using spalls. Stone spalls should not be used to fill up large spaces in stone work of this nature as the joints should be kept to a thickness of not to exceed three-quarters of an inch. The stones should be laid to break joints in courses and if the thickness of the wall is greater than the average narrowest width of the stone, bond stones should be placed at not to exceed three feet on centers each way. A preferred way is to provide a bond course about every two feet in height.

The outer and inner faces of the stone walls should be kept in approximately plain surfaces parallel to one another. The specification should require that all cutting and fitting that will be necessary to shape the stones to proper size should be done by the contractor, and that triangular stones should not be used. In masonry work of this kind it is necessary to keep the courses approximately level, although there is no objection to having occasional stones extending in height for two of the average courses. If such stones are available and if they are of the wall thickness they act not only as bond stones, for horizontal courses but for vertical courses as well.

Where pipes are to pass through walls stones must be provided of sufficient length to span the openings with a bearing on either side of at least six inches. As these openings are rather difficult to make watertight it would be well to provide openings large enough so that they may be filled with concrete after the pipe work is installed, with spaces for caulking left around the pipe.

Occasionally, in order to make the wall somewhat damp-proof, the specification writer may wish to provide a cement mortar coat on the outer face of the stone wall where it will be against the earth. This may be a mortar of same consistency as that used for laying the stone, and it should be applied in one coat of about three-eighths inch thickness brought to as uniformly smooth a finish as the stone surface will permit. No attempt should be made to apply a thick mortar coat as it might sag or crack and nullify the damp-proofing effect for which it is provided.

For exposed walls above the grade it will, of course, be desirable to specify large stones on the visible face more for the sake of appearance than strength of construction. As mentioned above, the question of stone finish such as rock facing, must be considered in this connection. The top course of stone that is to receive the super-structure work must be brought to a level and finished off with a cement mortar coat.

As subsequent articles will treat of stone masonry work from the foundations above it is believed that a study of these points and their incorporation in specifications will provide for the accomplishment of stone foundation work in a correct manner.

BRICK foundations are still of great use especially for minor construction work such as residential or small industrial work, especially in localities where good concrete materials are not available. The brick for foundations should be hard burned, whole and new. It is never safe to use old brick for foundations unless loads are extremely light or it is known absolutely that weathering to which the brick has been subjected, has not been detrimental to its physical structure.

If a concrete footing is not provided the bricks may be laid directly on the soil at the bottom of the trench. The soil should, of course, be as near level as possible and the first course of brick should be laid in a bed of gauged cement mortar. If desired, the footing may be made wider than the thickness of the wall with courses stepped up as may seem necessary. If a stepped footing is used projections should not exceed two-thirds of the thickness of the brick. The brick work should be laid in gauged cement mortar and if it is carried above the grade line, a damp-proof course should be provided approximately six inches above the grade line. This damp-proof course may be a coat of asphalt reinforced with one or two thicknesses of saturated felt, each layer being bedded in asphalt or in other medium of equal impermeability. Thin slate slabs or stone courses or even concrete has been used for this purpose. The object, of course, is to prevent capillary movement of moisture from the ground up into the super-structure.

The exterior surfaces of brick foundation walls where touching earth should be damp-proofed in some way. A coating of cement mortar may be used but a membraneous waterproofing consisting of asphalt with two or more layers of felt would be better, especially where moisture conditions come nearer requiring waterproofing as opposed to damp-proofing. In other respects the construction of brick foundation walls should not vary from the construction of super-structure brick walls, details of which will be the subject of later discussions.

Concrete block foundations should be laid in accordance with the above suggestions for stone and brick foundations.

HOLLOW tile may be used for foundations of light loads in residences or other small buildings. It has some advantages over brick because of the voids tending to arrest capillary attraction of ground water. In some respects the use of hollow tile is to be preferred over the use of brick although in other respects the use of brick should be given preference, and the matter of choice is the personal whim in the selection of materials. Hollow tile should have a footing of concrete or of large dimension-stone. The hollow tile should be laid in gauged cement mortar and damp-proofed courses provided above the grade line on those wall surfaces that are to be against soil, similar to those specified above for brick foundation walls.

It may be well here to mention that in some parts of the country vitrified clay wire conduit, such as used by the public utility companies in underground work, has been used with a very great deal of success for small residence foundations.

Having covered to some extent the particular requirements of foundation walls, there are some points governing the construction of isolated pier foundations under interior columns. These piers may be made of dimension-stone or brick but it is not believed that any serious attempt has been made to construct such footings of hollow tile. The stone or brick would be laid in a manner similar to that mentioned above for a wall construction. Quite often isolated piers are to receive steel grillage provided under steel columns or brick piers. This construction, of course, occurs in buildings of perhaps six stories or over where loads are heavy, such as will be found in warehouse or heavy industrial construction. The steel grillages must be bedded in cement mortar grouted with cement grout. If concrete footings are used, it is customary to encase the grillages with concrete, embedding the grillages in the concrete at least two inches.

The reader should remember that a number of points not mentioned above will be mentioned in later articles of this series covering particular work. In order to minimize the duplication of references, it is believed that where the work that is to be specified is applicable not only to foundations but to super-structure work it should be mentioned in the discussion of major uses. Such references have been made above and similar references will be made later to this or other preceding discussions so that the connection between the subjects of the various series will be complete.

### Why Building Will Increase

THE outstanding condition that points to an unprecedented building year is the present unsatisfied demand for buildings of every class.

December's remarkably good showing, following four months with high records, gives confidence to every one engaged in the building industry. There will be increased activity in every department of building, but in view of the well established shortage of residential types, it is reasonable to expect the greatest activity will be in apartment houses and dwellings in suburban localities.

A four billion dollar construction year has been prophesied for 1922. To meet this enormous volume every manufacturer in this country will be working overtime to supply the materials architects will specify.

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

THE *Architects' Journal and Architectural Engineer, London, December* 7. This number is almost entirely devoted to the exhibition of American Architecture, which under the auspices of The American Institute of Architects was shown in Paris during the summer and later moved to London at the earnest request of the Royal Institute of British Architects. A number of illustrations of representative work are published and there is an editorial comment which speaks highly of the exhibit, saying that it is "certain to have a strongly stimulative influence on English Architecture" but that "as English traditions, unlike the fickle English climate, are not subject to facile, sudden and violent changes, American methods of design and composition are not likely to be closely copied in this country." It also notes an "earnest striving" to give concrete expression to modern ideals and aspirations and that the designs are for the most part "purely organic."

From "The Architects' Journal"


There is an apparently verbatim report of the speeches of Bertram Grosvenor Goodhue and of Donn Barber, who, being in London, were invited to speak at a meeting of the Royal Institute of British Architects, and there is also a picture of Mr. Goodhue which is herewith reproduced. It isn't a particularly good picture and the dejected appearance of the distinguished architect warrants the caption under the picture—"Mr. Goodhue Weeps over the Styles." This is not, as it sounds, a gentle pastoral study in the Surrey fields, but refers to a statement of Mr. Goodhue that he *does* dislike modern classic architecture and at the same time strenuously denies that he is a Gothicist, but that he dreams that a "time will come when Architecture, as we understand the work will cease to exist and when such ornament as is used will be as instinctive and inevitable as it used to be." This delightful uncertainty as to where one stands is probably enough to make anyone weep; but Mr. Barber does not weep; "His crisp, clear phraseology cut at once like a knife into one's intelligence—no easy matter. (sic) His address—he would hate to have it called a speech—lasted for more than half an hour." Mr. Barber gave a brief outline of architecture in this country and referred to the high buildings and the zoning laws, matters that have particular interest in London because of the agitation now going on to increase the heights of buildings. Probably there is a demand for greater latitude in height in certain congested areas in London, and the Royal Institute of British Architects in working out this problem will have the advantage of the experiences we have gained here at so much cost, but it seems most unfortunate that the staid cities of the old world should be invaded by these monstrous monuments of efficiency.

*The Architect of London, December* 2, is also largely devoted to the American exhibition and gives a number of cuts which are rather better selected than the preceding paper, and in the description of the exhibition it states that Lady Astor's speech, which has been so widely quoted in this country, to the effect that "no architect should ever be allowed to build a family house until he has married and has had three children; and even then he must submit the plans to his wife first," wasn't really an opinion of the lady herself, but was a portion of a letter she had received from a friend who "managed to combine fox-hunting with socialism." This unusual combination may account for the quaint ideas on architecture attributed to Lady Astor.

*The Architectural Review, London, December.* The frontispiece is a drawing by Walcot of the Temple of Apollo at Thermos. The reviewer must confess that his knowledge of Thermos is confined to a certain well known article of trade in this country, and it is therefore difficult to criticise the restoration. The temple being entirely of wood has naturally disappeared, but there were apparently found certain fragments of the metopes and of the walls of the peristyle, which were decorated with slabs of terra cotta. Presumably the unusual size of the metopes in the illustration was dictated by the fragments that remained, but the restoration seems a poor one. It is topheavy, and certainly no Greek architect, even in the provinces, would be guilty of such outrageous proportions. It may be, of course, that this temple was laid out according to the ideas of Mr. Hambidge, and that the supply of string ran out when they came to do the lower part, thus accounting for the meagre appearance

From "The Architectural Review, London"

Wolseley Building, London
W. Curtis Green, Architect

of the supporting columns. Another etching by Mr. Walcot in the same number, entitled "The Visit of Comodus to the brothers Quintilii" is an extremely interesting composition, and if the brothers Quintilii did not really live in such a monumental house they should certainly have done so.

The Wolseley Building, Piccadilly, is illustrated at length and a view of it is herewith reproduced, because of its resemblance to many similar structures in this country. It is simple and dignified but not very well done, the piers of the arches in the lower story being much too small to provide proper support for the columns above. The plan and the interior of the show room are extremely interesting.

*Architecture, New York, December.* The frontispiece is a good photograph of a model of the George Rogers Clark monument by Robert Aitken and H. Van Buren Magonigle, which is vigorous and well composed. David B. Emerson has an article on "Common Sense Applied to Concrete" which is worth reading, and Frank E. Wallis shows some photographs and a plan of a house in North Carolina. David Varon has an article entitled "The Study of the Human Figure in Its Relation to Architectural Design." He says that "the least that a student architect ought to learn from this analysis is: simplicity of design, no matter how intricate the problem. Head, chest, abdomen and limbs are the four chapters (or five, by counting arms and legs separately) of the body." We would make the count seven for a normal human being, but perhaps Mr. Varon was referring to a victim of the late War or a museum freak. The whole article is arrant nonsense.

Sterner and Wolfe present a number of illustrations and several plans of a house at 2 East 63rd St., New York. The general scheme is extremely good. Frank Goodwillie and Wesley S. Bessel

From "The Architectural Record"


Elevation of National State Bank, Elizabeth, N. J.
Dennison & Hirons, Architects

show an administration building for the Globe Indemnity Company of Newark which is simple and dignified, and there is an article on "Oriental Rugs of Today" by Samuel R. T. Very which is good.

*The Western Architect, November.* In this number is featured the Quigley Memorial Chapel, Chicago, by Zachary T. Davis. This is a very ambitious building and should be very successful, but somehow or other it is not entirely so. The view from the corner is remarkably good but the interiors and the other side are rather hard and uninteresting. The plan shows that the large buttresses, which are an important feature of the elevation, disappear almost entirely when they cease to be in elevation and are concealed by the adjoining building, leading one to the natural assumption that these buttresses are for exterior effect only, and there is a series of neat little iron columns concealed somewhere or other for the support of the roof.

From "The Architectural Record"

Detail of the Bible House, New York City
Wilfred E. Anthony, Architect

Cady and Crosby have built a bank in Chicago, the Madison and Kedzie State Bank, which anyone would know is a bank because it has large Corinthian columns in front, together with a reduced copy of the Erechtheum doorway. I wonder how many times that poor doorway has been used on bank buildings in the United States. In the old days a bank that was a bank had a conical shaped gilded structure which was supposed to be a beehive, and this beehive without the bees was plastered on a sanded board painted black. Just what connection bees and banks have is uncertain, but it was a sign that was generally recognized. Nowadays its place seems to have been taken by the doorway of the Erechtheum.

*The Architectural Record, December,* opens with a continuation of the article on the work of William Lawrence Bottomley which was commented on in last month's criticism. The houses shown are generally good, particularly one in Roslyn, L. I. The mausoleum in Portland, Maine, is a little box-like and woodeny in character; the finial on the stepped roof is too small to silhouette well and the fragmentary inscription in the frieze is unfortunate. The coelnaglyphic sculpture does not show up well in the large photograph but looks interesting in the smaller photograph of the mausoleum as a whole. There are some interior views of the church of St. Vincent Ferrer, by Bertram G. Goodhue, which are very impressive, and Francis A. Nelson shows two photographs of a Post Office in Upper Montclair, very picturesque indeed in general effect, although one would not expect to find that style of architecture in Upper Montclair.

Dennison and Hirons have a bank in Elizabeth which is good, although the central motive, in which the door takes the place of the lower part of the window, is a motive that is not always satisfactory, particularly in the present case, where in the interior there is a second and smaller door inside of the larger one. The Bible House, by Wilfred E. Anthony, is represented by three photographs. The lower part of this building is extremely good and appropriate, but the upper part, particularly the termination of the façade in two octagonal piers, is not so pleas-

From "The Architectural Record"

Front View—Borough Hall, Roselle, N. J.
Warrington G. Lawrence, Architect

ing. The First Methodist Episcopal Church in Asbury Park, by Lucien E. Smith and Harry E. Warren, would have been much more successful had the architects not been obliged for obvious reasons of economy to adopt a simple square box-like plan. The church is of a simple brick type using North Italian Romanesque motives; the detail is good and well carried out, but much of the charm of this type of architecture is the irregular plan and the thick walls which are typical of the style. In other words, the church suffers from the undoubtedly forced use of modern methods of construction. The central dome springs from square cross walls so that the pendentives come to a point at the bottom, which is not a particularly pleasing or structural form; but as I have said before, the detail is good and the general effect is simple and interesting.

Warrington G. Lawrence presents a very novel idea in his town hall at Roselle, N. J. It is good but it would be much better if the two side gables had been eliminated entirely, or simplified.

Frank Chouteau Brown continues his articles on "Tendencies in Apartment House Design." His articles represent a great deal of industry in collecting various plans and will undoubtedly be published in book form and should prove valuable. He presents one very remarkable plan of an apartment in Cambridge, Mass., which fairly bulges with polygonal shaped rooms and looks as if it might have been designed by a bee.

*The Architectural Forum, December.* Malcolm Rice has an article on "Sgraffito and Its Application" which is well illustrated and authoritative. Griffin and Wynkoop show a restoration of York Hall, an old estate in Virginia. The old building is not particularly good architecturally on the outside. The entrance vestibule is a rather clumsy brick arrangement with two openings instead of a central one. The windows on the side are not symmetrical owing to the exigencies of the plan, and the treatment of the gables is not very good. The restoration is remarkably well done and there isn't a doubt the building is much better than it ever was, the only possible criticism being the use of large, graduated slates on the roof, which seems to detract somewhat from the scale, particularly of the smaller buildings. Griffin and Wynkoop are to be congratulated on their work.

There is a timely article on "Manufacturers' Literature" and the effort made by the Institute to eliminate the waste in this connection, and George B. Post presents photographs of an office building for Post and Flagg which is very simple and dignified.

*The Journal of The American Institute of Architects, January.* The editorial matter is interesting but has nothing to do with architecture, and criticism of it is out of place here. Charles G. Harper carries his article on "Thatch" from Nether Wallop to Bere Regis and Piddletown, with more of the naive illustrations in the ground glass slate style.

Edwin H. Brown gives a summary of the meeting of the Board of Directors in relation to the Committee on Small Houses, and publishes a reproduction in miniature of one of the matrices supplied to newspapers by the Architects' Small House Service Bureau. This Committee is doing a very constructive work and should be encouraged.

There is a report of the speeches of Mr. Goodhue and Mr. Barber above referred to and several articles on Community Planning and Housing.

Shottery, near Stratford on Avon, England
*(From a Photograph by Robert M. Blackall)*

# THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago, Ill.



*The American Architect and The Architectural Review has gratuitously set apart this section for use by The American Specification Institute.*

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*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review.

### Annual Winter Conference

To everyone interested in specifications—especially specifications for concrete construction—the Board of Governors extends a cordial invitation to attend the Annual Winter Conference at the Chicago Engineers' Club, 314 Federal Street, Chicago, on the evening of Friday, February 10, at 6:30 o'clock.

This conference is one of the bi-monthly conferences held by the Institute for the purpose of crystallizing the thoughts of architects and engineers who are interested in the improvement of specifications for building and engineering structures and equipment.

The program for the evening will include a banquet, following which there will be a discussion of Specifications for Concrete. The Board of Governors has prepared, as the subject of Bulletin No. 6., a specification for concrete which is based on and follows very closely, the progress report of the Joint Committee on Standard Specifications for Concrete. Other sources have furnished data of value in the compilation of these specifications and it is believed that the discussions will be of very great interest.

Reservations for the banquet may be made by application to the Acting Executive Secretary at a cost of two and one-half dollars the plate. Those who wish to make reservations are requested to notify the Acting Executive Secretary in time to permit him to mail a copy of Bulletin No. 6 in order that discussions may be made with an intelligent understanding of the specifications.

### Bulletins

Bulletin No. 5—"An Analysis of a Specification"—presents a phase in the study of specifications that has not received the attention it deserves. The sub-divisions that are given study are; Definition, Purpose, Elements, and Precepts for Specification Writers. A fundamental in the study of anything is a correct understanding of the characteristics of that thing, the functions it is to perform and some means of accomplishing the desired object. One purpose of the development of this "Analysis of a Specification" is its use as a "yard-stick" for specifications. Careful study of this bulletin will show that, no matter what any particular specification may be, even though it be an order drawn in requisition form, some of the "Elements" will be found in the document under scrutiny. The Board of Governors asks that Bulletin No. 5 be given very close study by the members in order that it may be perfected and stand as a useful guide and accurate gauge in the determination of the correct contents of a specification. Acknowledgment is made of the helpful suggestions submitted by Mr. L. O. Kirk of Minneapolis, in the compilation of the "Precepts."

As stated in the memorandum accompanying Bulletin No. 6, it has been necessary to prepare Bulletins No. 9 and 10 for distribution with it. The subject matter of each of the bulletins is covered in a brief, but concise manner, yet in a manner that is sufficiently inclusive of details. Nevertheless members are requested to send in their suggestions for each of them, especially for Bulletin No. 10.

Although the issuance of Bulletins No. 9 and 10 at this time is made ahead of Bulletins No. 7 and 8, the latter bulletins will be issued about February 1.

### The Advisory Committee

THE Chairman of the Advisory Committee, Mr. R. J. Gaudy, has appointed the following members of the Institute as members of his Committee in addition to those announced previously:

Frederick A. Muhlenberg, Philadelphia, John Galen Howard, San Francisco, L. O. Kirk, Minneapolis.

### New Members

The following new members have been elected: Curran R. Ellis, Architect, Macon, Ga.; Dewitt C. Gross, Engineer, Chicago; Seymour H. Knight, Engineer, Philadelphia.

Palazzo Schifanoja, Ferrara

*(From a Photograph by Robert M. Blackall)*

# BOOK NOTES

### The Economic Design and Construction of Small Houses*

MR. ERNEST FLAGG has produced a book that is very much worth while. The co-operation supplied by the publishers crowns the result. The book, it is certain, will be received by the architectural profession with much respect. Mr. Flagg knows his topic, and, what is very much to the present purpose, knows how to write it. The drawings which accompany a scholarly written text, and which, we are informed, were made by the author, are all splendidly executed and with the most painstaking care. The arrangement of each subject on one large page, the grouping of the various elevations about the main floor plan permit of the easy comprehension of the design.

Throughout, the work is one that will command respect. The small house has been dignified by as much earnest and thoughtful study as could be given to larger undertakings. The book from cover to cover is full of "meat" and it may be safely stated that it marks the highest signification of the problem of the small house that has ever been attempted in this country.

The contents of this book comprise some fifty-one essays, each taking up and discussing to finality the various essential things that enter into any enterprise in architecture, but, naturally, mainly from the point of view of the small house, Mr. Flagg writes well, states his facts solidly and makes his claims with courage. While there will, perhaps, be some dissension on the part of some architectural readers, none will withhold respect for a work wherein the author has, step by step, sought to justify his claims by the most scholarly professional methods.

At the outset, Mr. Flagg states that the object of the work "is to improve the design and construction of houses while reducing their cost." These desirable things he seeks to attain by many original methods. These, let it be known, are not methods based purely on theory. In each case there are presented completed houses to prove the argument.

While it is conceded by the author that it is hard to change long established building habits, it is as easy for individuals as it is for communities, to acquire bad building habits. These bad habits Mr. Flagg points out throughout his many theses, and he also points out how, in his judgment, they may be overcome. It is, therefore, possible to regard with respect a method so logical, even if the reader may not in some instances be fully in accord.

Mr. Flagg's small houses have stone walls. The designs throughout the work are based on the module system. There is a modulus or fixed unit of measure running through all parts. The author claims that great economies result from the use of this system. The leading essay is in its defense. As it is the foundation of design for everything that follows, it should be carefully studied. An interesting chapter on ridge dormers shows the advantages of these features in making available spaces that have been regarded as least desirable.

A particularly valuable feature of the work is the series of plans, and their discussion in the chapter devoted to them. "The collecting of plans" states Mr. Flagg, "is an interesting pursuit." He then proceeds to set forth his own methods of collecting and gives some exceedingly valuable and helpful suggestions for others.

"One of the best ways to design a building is to economize on ugliness." Thus reads the first sentence of the chapter on design. Even if nothing more were stated, the chapter would be something worth while. It sums up the whole essence of the planning of small houses. What has happened in the development of our suburban localities needs no description here. Every architect knows and deplores it. Certainly there has been a very prodigality of ugliness;—the result is obvious.

Enough has been quoted to inform the reader of the large suggestive value of this admirable work. It marks the best presentation of the small house from a definite point of view of architectural style and a fixed material that has thus far appeared.

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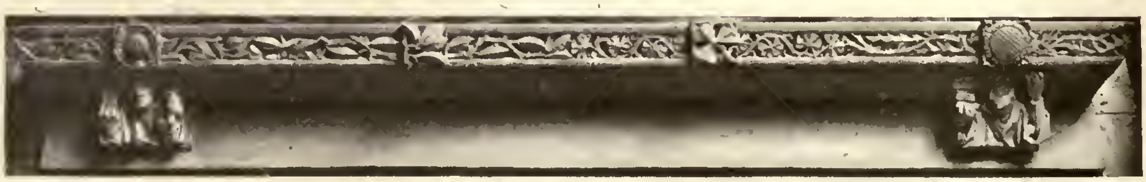
* *Small Houses, Their Economic Design and Construction, Essays on the Fundamental Principles of Design and Descriptive Articles on Construction. By Ernest Flagg, Architect. Full cloth,* 150 *pp. Size* 13x15 *inches. Price* $10.00. *New York, Charles Scribner's Sons.*



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DECORATION FOR UNION MARKET NATIONAL BANK, WATERTOWN, MASS.
DESIGNED BY ANDREW T. SCHWARTZ

DENNISON & HIRONS, ARCHITECTS OF THE BANK

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, FEBRUARY 15, 1922 NUMBER 2387

Two Green Elephants
Designed by Arthur Crisp and executed in Faience

# THE ARCHITECTURAL LEAGUE OF NEW YORK AND ITS RELATIONS TO CRAFTS AND MANUFACTURES

BY H. VAN BUREN MAGONIGLE, F. A. I. A.

THE Architectural League of New York holds this year the thirty-seventh annual exhibition in the history of the society. The significance of these exhibitions cannot be grasped, without a clear understanding of the structure of the League, the aims it holds, and its relations to the work of other organizations.

Of the three principal architectural societies in New York, the New York Chapter of the American Institute of Architects, in which membership is confined to architects, restricts itself primarily to the sphere of professional practice rather than to an art. The Society of Beaux-Arts Architects, composed of architects who have studied at the *Ecole des Beaux Arts* in Paris, devoted itself originally to the education of the architectural draftsman through the *atelier* system, and now, through a natural offshoot, the Beaux-Arts Institute of Design, has extended its influence by the inclusion in New York, of painting, and sculpture and the arts of design in general.

A fundamental difference of structure distinguishes The Architectural League membership as it is not confined to architects or architectural draftsmen. It is as its name implies and suggests, a league, under architectural leadership, of the arts, professions and crafts contributory to the art of architecture. The membership includes architects, painters, sculptors,

Eagle surmounting the shaft of the Pottstown, Pa., War Memorial

A. A. Weinman, Sculptor

and designers in all the crafts. It is almost wholly inclusive of the resident membership of the National Sculpture Society and the National Society of Mural Painters; and it has recently established a class of lay members, rigorously selected and invited from among the manufacturers of artistic materials and products.

The formation of this new class is eloquent of the widening horizon of the League and a fuller grasp of one of its useful functions—the *rapprochement* of the architect and the man who makes the things he uses. It marks a step forward. The architect forsakes his chilly isolation and invites the layman into his house. There, in the friendly atmosphere of personal association, of common work for a common end, the architect and the manufacturer begin to know each other, to understand each other, and as always follows, to respect each other.

"A son aise"
Swedish porcelain, by Mrs. George Oakley Totten, Jr.

THE recognition of the possibilities of usefulness of the League has been of slow and gradual growth. Organized originally as a sketch club by a few architects, there were added sculptors, and painters of decoration. The exhibitions at first were almost wholly of architectural drawings. But the group of decorative paintings and sketches grew in importance and interest year by year, and the sculp-

Boy and Dolphin
Swedish Sculpture, by Mrs. George Oakley Totten, Jr.

"Pan"
Swedish Sculpture, by Mrs. George Oakley Totten, Jr.

tors found the League shows to be the best place to exhibit their work, especially the larger pieces which the National Academy of Design does not accept.

During the past seven years the League has awakened to a realization of the fact which many architects, strange to say, are still unwilling or unable to admit, that since architecture is inclusive of every art that ministers to the comfort, convenience and comeliness of life, an architectural exhibition should properly include, not merely drawings and photographs of buildings, but those movable parts of buildings in wood, clay, metal, plaster and fabrics which complete them and make them habitable in the modern sense. These are furniture, lighting fixtures and fireplace fittings, hangings and fabrics of all kinds, carpets, pottery, tilework, leather in screens or bookbindings or as furniture or wall-coverings.

"Amusement"
Panel for a flag pole base by L. Lentelli, Sculptor

Figure of Victory on War Memorial at New Rochelle, N. Y.
Edmond T. Quinn, Sculptor

Therefore the League has adopted the policy of exhibiting, side by side with architecture in drawings, photographs and models, with mural paintings and sculpture, these actual products of the allied crafts, frequently creating an architectural setting in which they might be naturally displayed. The only requirements are that they be works of art and that they be not offered for sale at or during the exhibition.

To encourage the crafts and manufactures and to emphasize the importance they have in the League's vision of the relation to the diverse arts to architecture, and in recognition of the place the machine is beginning to occupy in the production of beautiful things in quantity, a medal and mentions, of rank equal to those for architecture, painting, sculpture and landscape architecture, were established in 1920 and are to be annually awarded.

BUT the exhibition is only an annual affair and were this public and formal recognition of the contribution of the craftsman to the art of the day all the League attempted to accomplish it would be little more than a polite gesture. It lacks the human touch, the warmth of human, as distinguished from official, relations. And so the League has developed into a club—one of the most interesting clubs in the country; and in thus developing, it has also, curiously enough, reverted to the original purpose of its foundation—artistic fellowship. There were many years in the League's history when this was lost sight of and the annual dinner and exhibition and a sparsely attended and lifeless monthly meeting made up the sum of human contacts.

With the establishment of a club night and dinner once a week, of which one or two in a month are studio nights when the members, under the guidance of experts, amuse themselves with all sorts of media of expression, and once a month a ladies' night, the League membership has grown in four years from 545 to 724 and is quick with extraordinary life and the spirit of fellowship. At a weekly dinner an architect may be seated in a group composed of a mural painter, a sculptor, a worker in metals either as designer or craftsman, a manufacturer of glass or fabrics, a decorator, a pottery or tile or faience expert, a designer and maker of stained glass, a bronze founder. Any one of these men may be a practitioner of some other art. The probabilities are in favor of at least one being an etcher of ability and distinction, that more than one paints well, more than one is a writer and an acknowledged authority upon more than one subject. And in this personal contact, with all its implications of mental exchange, in the friendships which spring up among practitioners of diverse branches of art, is more hope for better craftsmanship and architecture than in many medals. For one thing it enlarges the mind of the architect. And shall we dare to say: It needs enlarging?

Hell Gate Bridge
From the drawing in charcoal by Peter Marcus

ENTRANCE AND CLOCK TOWER, POLYTECHNIC PREPARATORY COUNTRY DAY SCHOOL, DYKER HEIGHTS, BROOKLYN, N. Y.

LORD & HEWLETT, ARCHITECTS

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

ENTRANCE PORCH, 1ST M. E. CHURCH, ASBURY PARK, N. J.

LUCIAN E. SMITH AND HARRY E. WARREN, ASSOCIATED ARCHITECTS

BUILT OF ROUGH BRICK AND POLYCHROME TERRA-COTTA IN OLD IVORY, GREEN, BLUE AND GOLD. THE CORNICE HAS COLORED MARBLE INSERTS. THE IRON-WORK IS PAINTED DEEP PLUM COLOR. THE STEPS ARE GRANITE AND LIMESTONE

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

ENTRANCE DOORWAY, 1ST M. E. CHURCH, ASBURY PARK, N. J.

LUCIAN E. SMITH AND HARRY E. WARREN, ASSOCIATED ARCHITECTS

THIS DOORWAY IS OF POLYCHROME TERRA-COTTA IN OLD IVORY, GREEN, BLUE AND YELLOW. THE GRILLE ABOVE THE DOORWAY IS ANTIQUE GOLD IN COLOR. THE DOOR ITSELF, IS OF WEATHERED OAK WITH INCISED CARVINGS ON THE LINTEL

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

THE GOOSE BOY — EMELIO ANGELA, SCULPTOR

(AT LEFT)

VICTORY—SCULPTURED PANEL, CHARLES C. RUMSEY, SCULPTOR

BROWNSVILLE MEMORIAL,—HERTS & ROBINSON, ARCHITECTS

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

# THE EXHIBITION OF THE ARCHITECTURAL LEAGUE OF NEW YORK WITH A FOREWORD ON THE DEVELOPMENT OF A BETTER CRAFTSMANSHIP

IT is fortunate that an organization such as The Architectural League of New York realizes the great importance that hinges on the development of craftsmanship in this country. We are insistently being told by certain groups in the profession that architecture is purely an art. But it is also something more. The artistic aspect is, of course, the dominating one. There have at one time or another appeared men in this country who, as designers lead the world. We are sure that these clever men, if questioned, will admit that the only limitation to the heights of good art to which they may soar is the possibility of reproducing in enduring materials the essence of that which their fertile minds create.

New York from the Manhattan Bridge

From the drawing in Charcoal by Peter Marcus

It is absolutely true that the limitation of our artistic architectural development is the limitation of craftsman ship. The development of the art of the craftsman will insure the greater development of the art of architecture.

Every practical thing is founded on some well considered theory. Every good design, whether its medium of final expression is metal, wood, stone or any of the many composite materials, fails of its originality, its cleverness of conception, if it receives its execution at the hands of incompetent craftsmen.

Most of the things that engage the councils of organized architecture are important. We may debate ethics, competitions, practice and procedure, or go academically into the many and complex elements of architectural practice, but we premise first that we are architects, and, to borrow a definition often expressed, that "architecture is the art of beautiful building." To prove that it is, clever draftsmen and fine renderers produce for the clients and for exhibition purposes the most artistically executed motives. That is just how the architect dreams of his completed building. Can he hope today to find his dream come true in all its artistic refinements? Can he expect when he turns over the building to his client that it will represent in its finer details the things he desired to place in it? Does not every architect turn back to his drawings and contemplate with a sigh of regret the fine things he has been compelled to forego because it was hopeless to look for their execution as he designed them. Undoubtedly, architects may hitch their chariots to a star, but their progress will not be upward and onward, but on a dead level of monotony owing to the indifferent quality of craftsmanship in this country.

But the future is brighter than the reader of the preceding lines may imagine, for there are certain influences at work which, if maintained in the future as in the past, will result in a development of a state of craftsmanship in this country and an education in public taste, that will create an artistic revival as important as that of the Italian renaissance.

It is now some seven years since The Architectural League of New York announced its purpose to conduct its exhibitions with a view to the development of good craftsmanship. Each succeeding exhibition, built on the experience and lessons learned, has more insistently accented craftsmanship. The work has been carried for-

Garden Figure
S. F. Bilotti, Sculptor

ward with intelligence, with painstaking zeal. So well has this association of architects carried forward its ideals that it has secured the co-operation and support of the most progressive manufacturers in this country. The present exhibition is tangible evidence of the great good that is being accomplished. Each exhibition of the League is a milestone on the road to the fulfillment of the highest ideals. These League exhibitions combine in the most dignified way an exposition of what may be attained by an intelligent co-operation of the highest development of art and industry conducted on the basis of the most efficient craftsmanship.

The pity of it is that the great lessons taught may only be benefitted by a comparative few who represent the smallest minority of those who are, or should be, deeply interested. If all our architectural exhibitions would condense their showing to a lesser degree of so-called architectural material, and increase the space in which those who are co-operating by good craftsmanship could demonstrate their work, this movement could be made nation wide. And it is vital that it should be.

We may only dwell briefly on one, and perhaps the greatest, deterrent factor in the retardance of our development in craftsmanship. Organized labor, intent more on wage scales and shorter hours, more insistent on availing of every possible profit to be derived from present conditions, has, many will claim, failed of vision. It has not given its fostering care to the education of those who will later enter its ranks. It has not been insistent as to the competency of those who now engage in work in all the many trades. But the outlook is not hopeless. Great crises produce great men, and we shall hope that present conditions will result in the appearance of a strong personality that will recognize the dignity of labor and how essential it is to increase its efficiency. Trade schools will then become, in the


Glendale Memorial Tablet
Anton Schaaf


The Vail Medal (reverse)
A. A. Weinman, Sculptor

truest sense, colleges for the highest education of the craftsman, and the apprentice will only be admitted to the ranks of organized labor when he has shown that he has the necessary qualifications to undertake the work he has selected. There are "misfits" in all professions, but the large percentage of misfits in the ranks of labor and in the crafts is the retardant that must be removed.

The Architectural League has so accented these things, not alone by means of its exhibitions, but throughout the year, by a quiet but persistent propaganda that is securing the finest results.

Architects are not the only ones that suffer limitations through poor craftsmanship. Engineers are equally hampered in their work. When we speak of craftsmanship, we do not refer alone to the artist craftsman, but to all those various departments of labor that contribute to the completed structure. Engineers know the handicaps that beset them. It is, therefore, reasonable to hope that the profession of engineering will take up these matters and by either individual effort or co-operation with architects lead the public to a better understanding as to why there is not a better result than is now obtained.

WHEN it is set down that the present exhibition of The Architectural League of New York is, in completeness and dignity, fully up to its predecessors, there has been written about all that can be said as to its excellence.

Architectural exhibitions have undergone, in the method of their preparation, some very radical changes. The original plan of a grouping of recent work where it might be seen by the profession embraced little, if any, attempt to interest the laity. The progressiveness of the architectural press which sought out and very thoroughly published meritorious work as soon as it was completed, naturally dulled the feature of novelty of exhibitions. Everything that an architectural society might gather as worth while in forming exhibitions was, as a rule, well known to all the profession and lessened the interest of architects in these annual displays. The idea then naturally was developed so to prepare exhibitions of architecture that they would combine all the features of a high class showing of art with a presentation so stripped of its technical aspect that the casual observer would be interested and through such interest become instructed in good architecture and its true

Dining Room, House of Bayard Dominick. Esq., New York City
Wm. F. Dominick, Architect

meaning and value to him and the community in which he lived.

A noticeable feature of the present exhibition of The Architectural League is the elimination of many features of pageantry that have formed such an important part of preceding occasions. This, we feel, is a move in the right direction. The League, during its season, has many opportunities for such relaxations and most artistically avails of them. The real aims of this organization as shown in Mr. Magonigle's article, are what should be the real aims of every architectural organization. No one may with truthfulness assert that this present exhibition does not beautifully and practically carry forward these purposes.

It has always been the policy of this journal to avoid specific reference to the work exhibited at an architectural exhibition, confining what it may have to say to a reference to the whole exhibition. It will not depart from that policy.

Before the outbreak of the War, the domestic architecture of this country presented the best illustration of the development of architecture as an art. Naturally the general retardance of building has worked changes in the character of exhibitions, but it is significant that the wealthy class, which logically is made up of shrewd business men, does not take stock in the pessimistic wailings that are or have been going up all over the country. Many large and expensive houses are shown and in their showing accent the remarkable advance that is being made in our domestic architecture in spite of the War's interruption.

Commercial buildings on which much architectural skill in design has been lavished are today the rule and not the exception. Years ago that shrewd gentleman, the client, who was placing in his factory building some of his hard earned profits, was unwilling to concede a dollar for ornament, insisting it was but an unnecessary, a useless waste of money. Now, owing to the fine education the architect has imparted to him, he begins to realize the commercial value of good architecture, and so proud is he of its possession that he places it on all his stationery and accents it in all his trade literature. There are many good examples of just that sort of thing at the League's exhibition.

Detail of interior, House of Charles E. Mitchell, Esq., New York City
Walker & Gillette, Architects

Schools and more schools. The school children

(Continued On Page 141)

# ·EDITORIAL·COMMENT·

AS THIS IS WRITTEN THE INVESTIGATORS, private and official, are busy in their efforts to determine the cause of the collapse of the Knickerbocker Theatre in Washington on the evening of January 28, resulting in the death of upwards of a hundred people. Until their reports are made public, the exact manner in which the structure failed, as well as the particular wall, truss member, column or detail that first gave way, will be conjecture. Perhaps, after the investigations have been finished, there will be disagreement concerning this point, but there is one obvious fact even now, that is,—if we disregard the rather slim possibility that there has been serious though undetected deterioration of the structure or some of its elements since erection,—the building was not built sufficiently strong in all its structural parts to withstand a snow load of some twenty-eight to thirty inches. To know whether the structure was uniformly weak, or whether some detail, some link in the structural chain, was alone responsible for the collapse, will, of course, be of interest and value, but regardless of the verdict, the safety of the public and incidentally the reputation of the architectural profession lies in so designing, detailing and superintending the construction of buildings that the factor of safety that is dictated by good practice actually exists in the finished structure. Too often it has been absorbed by faulty design, unscientific details, or cheap construction.

* * *

THE AMERICAN ARCHITECT HAS FOR years advocated the definite specification. The subject is always opportune. At a recent meeting of The American Specification Institute several members discussed the vexed subject and some good suggestions were made. The best were those advocating the principle of deciding what was wanted and getting it. A general specification followed by "or equal" may be assumed to mean one of two things: either the specification writer feels his inability, through ignorance, to be definite, or, he feels he will be criticized as having been improperly influenced.

The honest man who knows exactly what he wants knows himself above all criticism. It is not by accident he finds himself writing specifications. His clients employ him because of his supposedly special knowledge. His sole duty is to justify his employment. To excuse lack of definiteness on the ground that he might be charged with favoritism is the excuse of the man who is afraid of his client.

Materials are rapidly becoming standardized, but this merely helps the mass. Standardization sets a possible minimum of attainment and marks a step forward in an industry. It does not affect the man whose basic knowledge is sound and fortified by experience. Standardization regarded as finality in a material or a process acts as a bar to further progress. Standardization in methods of manufacture of, and the adoption of standard specifications for testing Portland cement, by no means puts all makes of cement on an equal footing. There always will be manufacturers whose standard is higher than that of a passing mark. To such men in the past credit for improvement after improvement was due until finally all makers adopted a standard that is satisfactory for general work. The makers of better cement, however, employ chemists who are research workers rather than mere controllers of product. Their material possesses a quality which analysis does not show and the brand is the indication of this quality. Standardization of other products, brick, stone, tile, timber, to mention only a few, cannot wholly cover color or texture and the specification writer must definitely select that which meets trade standards, plus what he knows he wants. To the end of time all makers of definitely superior products may confidently expect and have earned the right to demand that their materials be specified by name or brand. Were this not so, all creative evolution would cease.

* * *

IT IS NOT WITH MATERIALS ONLY, but it is with equipment and service supplies that the architect must concern himself. A general specification for equipment will state the object of the installation and call for quality of materials, performance of the completed work and a guarantee. Any one of a dozen or more manufacturers can supply the equipment and a choice must be made. The indefinite specification puts off the choice until the equipment is needed. The definite specification settles the matter before the plans are made public. It implies careful consideration of the subject during the time the whole project is being studied. There can be no question raised as to the advisability of writing a definite specification when the fact is borne in mind that but one article can be used and that some day it must be definitely chosen. To make the choice before writing the specification and hold unswervingly to it has a good effect on the client and leads the better class of manufacturers to respect the courage of the specification writer. It is an axiom that the writer of definite specifications puts quality above price. He also knows what should be a fair price and honest manufacturers and dealers do not increase prices when their products are specified without an alternative. Such a course is suicidal. The definite specification indicates in its writer the possession of knowledge, ability and the courage of his convictions.

* * *

THE TREMENDOUS ABSORPTION OF capital by the government and the flow of gold to our shores gave speculation full sway until in 1920 the people instituted a strike against high prices, yet still demanding high salaries and high wages.

Deflation commenced and the government finances suffered so that taxes increased. The foolish governmental system of selling securities at rates of interest below the market rate and relieving these securities from taxation caused investors to put their capital into government securities instead of into productive enterprises. The government has tied up too much of our circulating medium and we suffer from a shortage of currency at a time when the per capita wealth exceeds anything heretofore known. Per capita circulation, however, bears a smaller ratio to per capita wealth than at any time in our history.

The confusion caused by this state of affairs has created a condition of uncertainty in the public mind that is converted into suspicion by numerous investigations and the unwise publicity given to them. The earlier investigations were needed and did the country good. Their success has simply caused imitators to attempt to play a chord with which the people are bored.

Business is resuming. From all sections come reports that plans are being prepared and contracts are being let. Competition is a natural law and we learn day by day that it is operating. Wages of building mechanics alone are firm, but this deterrent will be greatly modified when summer comes and a demand for labor sets in. Thousands of men competent to serve as building mechanics are not organized. The best authorities claim that if the amount of building, cubage not dollars, exceeds by twenty-five per cent. what was normal in 1913, a normal rate of building to take care of ordinary demands, will not be reached for nine years. The twenty-five per cent. increase is needed to make up deficiencies. The need everywhere is for houses costing less than ten thousand dollars; in the larger cities, apartment houses and tenements in which rooms will rent for less than ten dollars per month. The time for investigation has passed and our hard-worked investigators are needed on construction work with saws and the hammers they wield so well.

* * *

THE BUILDING INDUSTRY OF NEW York City is to be investigated again and again. By the State first, and then by the Federal government. The sum total of results of investigations recalls to one the statement of Thomas Hood about the Statistical Bureau in which he was employed for a time. "Statistics," said Hood, "enable many deserving party workers to keep alive. Their labors show us that in the course of a certain number of years one Irishman and a fraction of another, wear out two shirts and a small fraction of a shirt; and, no one ever sees an Irishman wearing other than the fraction of a shirt."

So the labors of partisan investigators reveal to the people many things which, played upon by the press, confuse the issue and serve to reduce the building industry to a small fraction of what it should be. Investigations have a value when they are needed, but the building industry has been over-investigated and needs a rest.

Every thinking man knows what is wrong and knows what the industry needs. Under the exigency of war and the need for materials and labor, the building industry was forcibly directed into one channel. This gave an opportunity for consolidation on the part of the manufacturers, materials dealers and, above all, organized labor.

The building industry, the second largest in this country, being second only to agriculture, is manifestly not to be classed as "an infant industry." It can very well take care of itself and for the present, the future, as in the past, may be safely left to work out its own problems. It is not properly a field for politicians to seek for campaign material, nor for government interference, state or National. There can be co-operation, but there is no need for the assumption of an overdone paternalism.

Mr. Untermyer's largely exploited scheme to provide for the housing shortage would have no reason for existence if the factors which now retard building were investigated so that the building industry, freed of impediments which it cannot overcome, might normally function.

Government investigation is not essential. The building industry can investigate its own shortcomings. What the government might and should do is to investigate those influences that are outside the industry, which now retard building progress.

HOUSE OF MRS. L. C. HANNA, CLEVELAND, OHIO

WALKER & GILLETTE, ARCHITECTS

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THE HALL

HOUSE OF MRS. L. C. HANNA, CLEVELAND, OHIO

WALKER & GILLETTE, ARCHITECTS

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

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HOUSE OF MRS. L. C. HANNA, CLEVELAND, OHIO
WALKER & GILLETTE, ARCHITECTS
*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

140 3

HOUSE OF MRS. L. C. HANNA, CLEVELAND, OHIO
WALKER & GILLETTE, ARCHITECTS
*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

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HOUSE OF MRS. L. C. HANNA, CLEVELAND, OHIO
WALKER & GILLETTE, ARCHITECTS
*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

DINING ROOM

HOUSE OF MRS. L. C. HANNA, CLEVELAND, OHIO

WALKER & GILLETTE, ARCHITECTS

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

140 c.

HOUSE OF ROBERT T. MC CRACKEN, ESQ., GERMANTOWN, PHILADELPHIA, PA.

MELLOR, MEIGS & HOWE, ARCHITECTS

(*Thirty-seventh Annual Exhibition, The Architectural League of New York*)

1407

HOUSE OF ROBERT T. MC CRACKEN, ESQ., GERMANTOWN, PHILADELPHIA, PA.
MELLOR, MEIGS & HOWE, ARCHITECTS
*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

140 8

PIGEON TOWER, SHEEP FOLD AND GOOSE POND, FOR A. E. NEWBOLD, JR., ESQ., LAVEROCK, PA.
MELLOR, MEIGS & HOWE, ARCHITECTS
(*Thirty-seventh Annual Exhibition, The Architecturol League of New York*)

140 9

140

HOUSE OF HAROLD H. WEEKS, ESQ., ISLIP, L. I., N. Y.

GROSVENOR ATTERBURY, ARCHITECT; STOWE PHELPS AND JOHN TOMPKINS, ASSOCIATES

BUILT OF CAST CONCRETE BLOCKS, FINISHED WITH A COLORED AGGREGATE. NOTE THE CAST CONCRETE CHIMNEY CAPS MADE TO SPECIAL DETAIL. ROOF OF MOTTLED GREEN AND PURPLE AND UNFADING GREEN

STAIRHALL IN HOUSE OF HAROLD H. WEEKS, ESQ., ISLIP, L. I., N. Y.

GROSVENOR ATTERBURY, ARCHITECT; STOWE PHELPS AND JOHN TOMPKINS, ASSOCIATES

FLOOR IS PAVED WITH RED QUARRY TILE WITH SAME TILE AS BASE AND IN PART FINISHED WITH DARK RED BRICK. STAIRCASE IS BUILT OF REINFORCED CONCRETE WITH A FINISH OF BRICK ON TREADS AND RISERS. HAND RAIL OF WROUGHT IRON. WALLS, PLASTER WITH PLAIN SAND FINISH

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

140"

HALL IN HOUSE OF RICHARD E. FORREST, ESQ., HARRISON, N. Y.
GROSVENOR ATTERBURY, ARCHITECT; STOWE PHELPS AND JOHN TOMPKINS, ASSOCIATES

140

HOUSE OF DAVID S. BALL, RIVERDALE, N. Y.

JULIUS GREGORY, ARCHITECT

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

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ELLIPTICAL STAIRCASE IN HOUSE OF MRS. H. LORILLARD CAMMANN

WM. F. DOMINICK, ARCHITECT

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

140 14

INTERIOR VIEW, 42ND STREET BRANCH, NATIONAL CITY BANK OF NEW YORK
McKIM, MEAD, & WHITE, ARCHITECTS
*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

140

LIVING ROOM, HOUSE OF SAMUEL A. SALVAGE, ESQ., FLUSHING, L. I., N. Y.

ROGER H. BULLARD, ARCHITECT

*(Thirty-seventh Annual Exhibition, The Architecturol League of New York)*

**Exhibition, The Architectural League of New York**

(*Continued From Page* 138)

of today are the men and women of the next generation. The fact that they have secured their preliminary education in school buildings of the highest type of development, the finest architectural design, will educate them, particularly the boys, to a most respectful attitude towards good architecture and its good influences.

And so, throughout this exhibition, the thoughtful observer can easily trace the broadening influence exerted by architects on the education of the people. They have taught people how to live up to the ideals suggested by their houses. They have made the school children equally proud of a dignified association. They have taught the business men that there is a wonderfully efficient and permanent means of exploiting manufacture. And with the development of good architecture and the development of an appreciation for it, all the arts have benefitted. The painters, the sculptors and the decorators have benefitted in the largest measure by this great development of architecture. Architecture as the first of all the arts, yet maintains its supremacy as the first in importance and influence of the people.

The Architectural League exhibition inspires these thoughts. Its whole character is dignified and truly representative of the first of the arts, and the entire profession is placed under obligation by this society and the men who have unselfishly given of their valuable time to insure its fine completion.

Description of this exhibition would not be complete if it omitted extended mention of the grouped display by the mural painters of small size model interiors of homes for people of moderate means. This feature is replete with the most valuable suggestions for architects, decorative designers and home makers. The best known of American mural painters have worked out these small model interiors in a variety of styles indicative of widely divergent lines of thought and antecedence in artistic education.

In this distinguished grouping there may be found suggested the courtly sentiments of Ancient Florence, the substantial and well-conditioned life of Georgian England, the delicacy and refinement of Louis XV, and the distinctive charac-

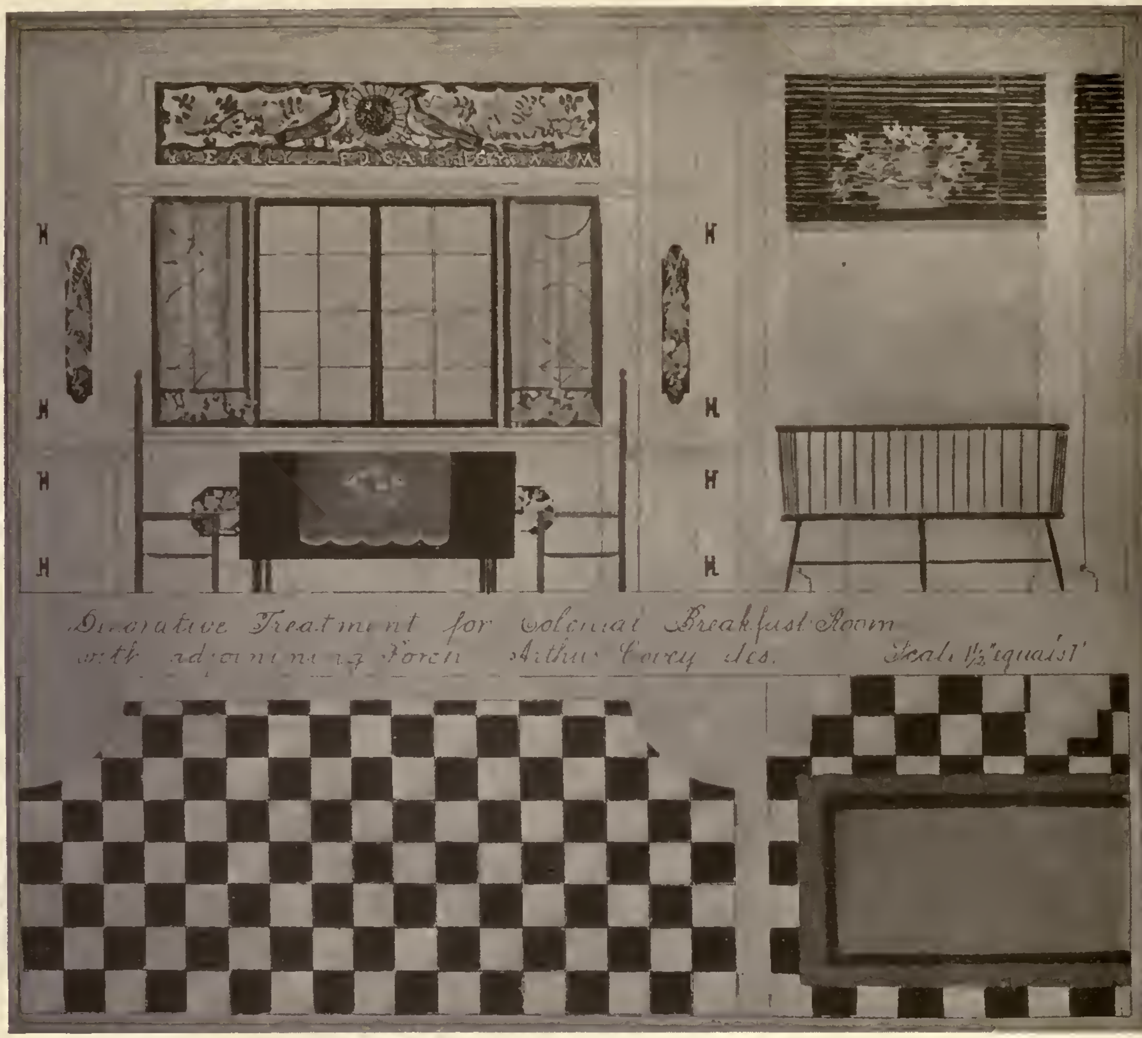

Decoration for a House at Scarboro, N. Y.
Fred Dana Marsh, Painter

teristics which mark the period of Marie Antoinette.

Taking this interesting feature as a whole, it may, with moderation, be said to mark an epoch in the history of American art. In these miniature arrangements for different types of rooms suitable to the houses of folks of moderate means, there may be found in actual and practical form, the practical advice of experienced artists and a great multitude of home makers.

The general character of the exhibition as a whole reflects the greatest credit on the Exhibition Committee and suggests in this instance, as it has in the past, that a great many men in the profession are giving a large amount of valuable time and the highest trained services to co-operate for the best results and the most successful outcome of the League exhibition.

The catalog has been prepared with usual care and is encyclopædic in its completeness as a record




Arthur Covey, Designer

of the best work in architecture and the allied arts that has been completed during the past twelve months.

There are no good reasons that can be advanced why small domiciles should not be just as artistic and just as beautifully developed as the houses of the ultra rich. By developing the small house model idea, the majority of our people can profit by the taste and learning of our best known decorators, architects, painters and draftsmen.

At the very outset of the opening of the exhibition this unusual feature afforded the greatest amount of interest and its excellent arrangement made it possible to study the various designs with ease and comfort.

We took occasion, in a previous issue of The American Architect to suggest the desirability of selecting from this exhibition a quantity of material that might form a traveling architectural exhibit and be shown throughout the country. Having had the privilege of a private view we are more impressed than ever with the practicability of such an exhibition, and strongly urge its consideration by the League.

### The Awards

THE awards were announced by the chairmen of the juries of award. Walker and Gillette received the highest honors in architecture for "the general excellence of their residential work." "For the distinctive character of his work in decorative sculpture" Leo Lentelli received the medal in this division. Ezra Winter, "for his decoration of the ceiling in the Cunard Line offices," received the medal in painting. Olmsted Brothers, of Brookline, Mass., were awarded first honors in landscape architecture for their designs of the gardens of the Warren Bicknell estate, in Cleveland, and H. G. Latham, of Brookline. In native industrial art the award was made to Samuel Yellin for his work in wrought iron.

Additional honors were the Avery prize, which was given to Miss Grace H. Talbot for her bronze sculpture, "The Novice," and the collaborative prize in architecture, sculpture and painting. This was presented to F. H. Creamer, C. Paul Jennewein and George Davidson, for their design and execution of the full scale entrance doorway in the south gallery.

Wm. F. Dominick, Architect

VIEW LOOKING TOWARD ENTRANCE

BANKING ROOM, NEW YORK TRUST COMPANY, NEW YORK,

WALKER & GILLETTE, ARCHITECTS

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

DETAIL OF LOBBY

OFFICERS' SPACE

BANKING ROOM, NEW YORK TRUST COMPANY, NEW YORK.
WALKER & GILLETTE, ARCHITECTS
*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

INTERIOR VIEW

ST. STEPHEN'S CHURCH, RIDGEFIELD, CONN.

W. K. RAINSFORD, ARCHITECT

*(Thirty-seventh Annual Exhibition, The Architectural League of New York)*

MODEL OF GROUP FOR OAKLAND GOLF CLUB, BAYSIDE, L. I., N. Y.

HOUSE OF MRS. HUGH D. AUCHINCLOSS, FAIRFIELD, CONN.
ROGER H. BULLARD, ARCHITECT

MODEL OF A HOUSE AT EAST HAMPTON, L. I., N. Y.
LUCIAN E. SMITH, ARCHITECT

*(Thirty-seventh Annuol Exhibition, The Architectural League of New York)*

# DEPARTMENT OF SPECIFICATIONS

## Specification Outline for Foundations

IN the previous four issues of The American Architect this department has discussed foundation construction work, shoring and underpinning of adjoining buildings and sheet piling work. The assumption was made that the scope of this series should be restricted to exterior or retaining walls up to grade line and interior column or wall footings up to the bases of interior columns or to top of wall footings.

In briefing these discussions for the following suggested outline the reader may discover minor details that were not given prominent mention. The outline is capable of expansion or contraction, according to the desires of the user and will serve to indicate, to some extent, the sequential steps necessary to the construction of a specification for foundations.

I. General Conditions

a. A paragraph referring the reader to the General Conditions that will be made a part of the contract and which should be read by all bidders. This should be a standard clause.

II. Scope of Contract

a. Extent of the work.
b. Work of a similar character that already has been done by other contractors.
c. Work of a similar character that will be executed later by other contractors.
d. A statement as to soil conditions that may explain subsequent specification requirements for sheet piling, drainage of ground water or other phases of a similar character
e. Disposal of excavated material
f. If the statement under "a" above is explicit, omit the too common "all inclusive" clause which so often serves as a dumping ground for disputed claims.

Note. If the statement under "a" can be arranged in tabulated form its clarity will be accentuated and the businesslike appearance of the specification will be improved.

III. Examination of Site

a. Caution bidders of the necessity for making visual examination of physical conditions of the site before estimates are submitted so that foreseen expenses may be anticipated and included. Do not assume, however, that work that cannot be anticipated by the architect should be foreseen and included by the contractor in his bid.

IV. Quality of Materials

a. Each material that the contractor is required to furnish should be listed here and the standards of excellence that will determine their acceptance or rejection should be specified distinctly. This grouping is suggested here so that all readers of the specification will know where to turn to when looking for quality of materials.

Note. Although subsequent outlines will present the matter in greater detail the specifications for the following materials may be required.

1. Cement
2. Sand
3. Gravel
4. Crushed Stone
5. Slag
6. Integral Waterproofing Compounds
7. Reinforcing Steel
8. Sheet piles
   - Wood
   - Steel
9. Foundation Piles
   - Wood
   - Concrete
     - Pre-Cast
     - Cast in place
   - Steel
10. Caisson Material
    - For open wells
      - Lagging
      - Rings
    - For pneumatic work
      - Shields
      - Material for joining caissons used as watertight retaining wall construction
11. Rubble Stone
12. Brick
13. Concrete Blocks
14. Clay Tile Blocks
    - Standard building tile
    - Telephone Conduit

V. Samples of Materials

a. If samples of any materials are to be submitted for approval before delivery, state so, in order to avoid later unpleasant experiences.

VI. Inspection of Materials
- a. If certain materials are to be inspected by testing engineers, state so, laying down all conditions that the contractor will be required to meet.
- b. It is suggested that testing engineers be employed and paid by the Owner direct.

VII. Delivery of Materials
- a. If materials are to be delivered over switch track close to or on site, state so. If it is believed that all materials will be delivered by truck it may not be necessary to use this paragraph unless conditions out of the ordinary are present.

VIII. Hours of Work
- a. If shoring and underpinning for adjoining buildings or sheet piling operations must be carried on continuously, state so, giving reason for this requirement.
- b. If caisson excavation work must be carried on continuously this, too, must be specified.

IX. Contractor's Design Drawings
- a. If the specifications require the furnishing of fabricated items or other work for which the contractor is to prepare design drawings for the approval of the architect or his engineer (either consulting or testing) the governing conditions should be stated.
- b. Shop or fabrication drawings based on the contractor's design drawings should, of course, be submitted for approval where the controlling design drawings must meet approval.

X. Construction Plant
- a. It is a debatable question whether the specifications should attempt a very great control over the construction plant although, for some operations comprising extraordinary phases, there may be occasions demanding some specification control.
- b. Erection machinery should be so disposed that little interference will be given the work of contractors not concerned with the use of these particular appliances.
- c. Erection machinery that is to be placed on structural concrete structures should not be located without the approval of the designer of the structural framework, else damage may be done to the structure.

XI. Soil Tests by Applied Loads
- a. Number to be made
- b. Character of testing platform
- c. Area of soil to be tested
  1. At least three square feet
- d. Provision against upheaval of soil under test
- e. Gauges
- f. Record of settlements
- g. Application of loads
  1. Full design load—duration
  2. Excess load—duration

XII. Soil Tests by Borings
- a. Number to be made
- b. Augur borings
- c. Wash borings
- d. Core drillings
- e. Method of recording observations
- f. Care and storage of material removed

XIII. Shoring and Underpinning
- a. State existing conditions, giving, if possible, the depth, character of construction and present condition of foundations or other structures that are to be shored or underpinned.
- b. State whether structures that are to be underpinned or shored will be occupied during the operations and, if so, whether portions of the structure must be worked on at stated intervals or if the work may be carried on continuously.
- c. Require observation of levels on walls being shored or underpinned and on other parts of the structure that may be affected by settlement of such walls, these observations to be made at stated intervals.
- d. State character of shores, needles and underpinning that may be required unless the character and design are to be left entirely to the discretion of the contractor.

XIV. Sheet Piling
- a. State reasons for use of sheet piles
- b. Character of sheet piles
- c. Fabrication, placing and bracing of sheet piles

XV. Drainage of Excavation
- a. State requirements as to removal of water and maintenance of dry conditions—to include rain fall as well as ground or other water seepage.

XVI. Finished Excavation Work
- a. State what excavation work will be done by the contractor for rough excavation.
- b. Be definite with respect to responsibility for excavation of pits or trenches for elevators, sumps, tanks, drainage systems or other similar work.
- c. If some banks of earth may be used as concrete forms, state so, otherwise re-

quire that finished excavation be sufficient to permit correct erection and removal of forms.

d. Require that all excavations for foundations and footings be carried to soil of suitable character. If drawings show specific levels for foundations a price per cubic foot or yard should be asked so that additional excavation and foundation work will be understood to be additional to the contract price. The unit prices submitted should include the net cubic footage of foundations built regardless of excess excavation the contractor may wish to make.

e. If excavations in soil of suitable bearing capacity are carried below designed levels, prohibit filling and require that foundations be started at such level without extra cost.

f. If unit prices per cubic yard for excavation work are requested do not fail to be explicit in stating whether measurement will be made of excavated material in its natural position or as placed in trucks. This point is of the greatest importance.

XVII. Pile Foundations

a. Kinds of piles
   1. Wood piles
   2. Concrete piles
      pre-cast
      cast in place
      reinforcement
   3. Disc piles
   4. Screw piles
   5. Sand piles

b. Sizes of piles

c. Chemical preservation of wood piles

d. Mechanical protection of piles

e. Metal shoes and butt rings

f. Driving of piles
   1. Drop hammer
   2. Steam hammer
   3. Water jet
   4. Broomed butts cut off wood piles
   5. Prohibit over-driving

g. Determination of penetration

h. Cutting off piles—below water level

i. Test loads on piles

j. Rejection of driven piles and driving of additional ones

k. State method of payment for piles, preferably per linear foot of driven pile as cut off to receive cap or footing.

XVIII. Caisson Foundations

a. Open well type
   1. Lines, grades and bench marks, for layout, checking after lagging is started, when wells are completed and when concreting is nearly finished.
   2. Lagging—preparation of—sizes
   3. Lagging rings—f o r m—sizes—number
   4. Coffer-dams
   5. Excavation—to be continuous except on Sundays and holidays—held to required diameter—no excess excavation—special precautions where shifting soils are encountered and where work is close to existing foundations—belling out.
   6. Placing of lagging and rings—placed as excavation progresses—rings wedged where necessary to hold lagging tight against earth
   7. Inspection of wells—as work approaches final levels
   8. Test holes drilled—state number of holes or ask for price per linear foot per hole.
   9. Mix of concrete—see subsequent issues for concrete specifications.
   10. Placing of concrete—removal of rings—lagging left in place. If soil requires leave rings in place.
   11. Caisson topping—granite aggregate—reinforced.

b. Pneumatic Caissons
   1. Type and design
   2. Sinking
   3. Filling

XIX. Footings and Foundation Walls

a. Plain concrete

b. Reinforced concrete

c. Forms for concrete—erection and removal

c. Reinforcing—furnishing and placing.

d. Placing of concrete

e. Stone

f. Brick

g. Concrete blocks

h. Hollow clay tile

i. Steel grillages


COMBUSTION ENGINEERING BUILDING, BROAD STREET, NEW YORK
LUDLOW & PEABODY, ARCHITECTS


DETAIL OF LOWER STORIES
COMBUSTION ENGINEERING BUILDING, BROAD STREET, NEW YORK
LUDLOW & PEABODY, ARCHITECTS


DESERET BANK BUILDING, SALT LAKE CITY, UTAH

CANNON & FETZER, ARCHITECTS


BUILDING FOR AMERICAN MOTOR REPAIR CO., SAN FRANCISCO, CAL.

SYLVAIN SCHNAITTACHER, ARCHITECT

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## CAN IT BE BUILT?

### A Discussion of the Treatment of Common Problems that take Extraordinary Form

By David C. Coyle, C. E.*

IN the early stages of a design, when it is as yet nothing but a plastic mass of sketches and ideas in process of formation, the question of structural possibilities is always hovering in the background. For most cases there are the precedents, in the architect's experience and in his studies, defining more or less definitely the limits of what can be done. Beyond them lie the unusual problems, or the opportunities to handle a design in an unusual way; a field whose boundaries are gradually enlarging from year to year. This article is intended to outline a few of the answers to problems which arise so infrequently as to require special treatment, and to suggest certain possibilities of design outside the ordinary precedents. These are all simply variants of the question whether the necessary structural material will go in the available space; a point upon which it is desirable to have as full data as possible in advance of the finished design. To provide some of these data in a form more convenient than is usually available, is the object in the discussion of the following frequently recurring cases.

One common problem that may take an extraordinary form is the gallery of an auditorium. If there are two rows of columns back of the gallery, it may be cantilevered, so as to eliminate posts and hangers; but, if it has to run along an outside wall on a single row of columns, and if it is too long to span from end to end, the matter is not so simple. If the columns run to a roof twelve or fifteen feet above the gallery, the gallery beams can be strongly attached to the columns, and the roof will hold the top of the columns so that the whole will not pitch forward into the auditorium. But if the roof is very high, the columns must be correspondingly deep, involving heavy pilasters, or else the live load may cause a noticeable deflection, and the column may bend enough to injure the wall. Such a case has been handled by X bracing the floor of the gallery from end to end; where vertical bracing in the side walls took care of the tendency to pitch forward. Thus the columns above the gallery were relieved of this load, and it was unnecessary to make them of unusual size. Another form of gallery without visible supports may be made by spanning a deep girder from end to end, under the second or third row of seats, where the depth is sufficient to give the necessary room. In this case the toe of the gallery is carried on beams cantilevered out from the girder.

It often happens that a large room has to be placed in the lower part of a building, and the columns above must be carried by a truss occupying an entire story. Passages through such truss have to dodge the web members, often with exasperating results. Where there is an odd number of panels the web stress across the center panel is usually small, and it has been found possible to omit the diagonal member entirely from this panel. The bottom chord was made a plate girder of moderate depth, stiff enough to carry the shear ordinarily taken by the diagonal. Another possibility is to move one or more panels of the truss from their normal location into the story above; this arrangement requires the addition of one extra panel to brace the offset and involves expensive details. Where the supporting columns below can be placed some distance in from the ends of the truss, the stresses in the latter are considerably reduced, which may be an important consideration where space is cramped, and will also help to reduce the cost.

Where the design makes it possible to set the wall columns back five or six feet from the wall, as in a city building with no side windows, such an arrangement may have advantages. In a loft building forty feet wide, with columns so placed, the interior columns were entirely eliminated and the floor girders were only 24 inches deep, straddling the columns and picking up the wall on their

* *With Gunvald Aus Company, Engineers, New York City.*

cantilever ends. Had the columns been placed in the wall in the usual position, the girders would have been much deeper, though not so wide. Another effect of this cantilever arrangement at every floor is the elimination of cantilevers in the foundation; and in the case above mentioned it also made it possible to avoid the underpinning of an adjoining building.

Domed roofs hold an evident fascination for architects, and a less evident but very powerful fascination for engineers. Their possibilities are many, but from an engineering standpoint they have certain limits. Almost any size of hemispherical dome can be built, but if it stands on a cylindrical wall or row of columns, it is impossible to make it stay up without rings around the bottom, or buttresses which are deep enough to produce an equivalent effect. A masonry dome has no theoretical necessary thickness except to provide for the slight shifting of load due to snow or wind. If it is flatter than a hemisphere, however, it becomes a more difficult problem. It may even be impossible if it is very large and flat, because of the tremendous strains incident to

A loft building, 66-70 West 40th Street, New York City, with side walls carried on cantilever ends of floor girders

Necarsulmer & Lehlbach, Architects

Gunvald Aus Company, Engineers

unequal snow and wind loads. Roofs of this shape may be built as false domes, containing steel roof trusses between their outer and inner surfaces. Domes of elliptical plan are difficult but possible, either in steel or in masonry with steel bands, but, even more than circular domes, they need to be high in profile to keep the stresses within bounds.

66-70 West 40th Street, New York City, on Nov. 17, 1921

Thin floors are often a matter of disagreement between the optimistic architect and the pessimistic engineer. There are cases, however, when unusually thin floors may be achieved. In an apartment house, with its light live load, a floor of fourteen foot span has been made with six inch H sections as beams, figured not for strength but for deflection. A dormitory has been economically designed with a plain six-inch slab with no beams or girders and without the usual drop panel or enlarged column capital, with columns of reinforced concrete spaced ten by twelve feet. A very thin floor may be obtained by certain patent two-way tile and concrete combinations, with which panels as large as sixteen feet square are designed for a six-inch slab. It is a bold engineer, however, who will express an opinion in advance as to the stiffness of such a floor, for its deflection under moving loads cannot, with available data, be accurately computed.

Where the spacing of columns is not fixed by architectural considerations, it is convenient to know in advance what will be most likely to give an economical design. In general it may be said that tall buildings should have few columns and long girders, while low buildings are more economical with smaller bays. If the columns rest on rock near the surface, or on spread or pile footings, the more columns the less the cost. If the

The same building, Jan. 17, 1922

foundations must go deep, there should be as few columns as possible.

One common annoyance of architectural work is the necessity for searching through a steel handbook for the dimensions of steel beams. The following tables are convenient for ascertaining the required clearance from the face of the fireproofing to the center of the steel beam. In the case of channels the distance given is from face of concrete to back of channel when its legs are turned toward the opening. For finding the dimensions of steel around openings, given the steel framing design, these tables will save considerable time and possible errors. They also give the new standard weights of Carnegie beams, and the recent additions to Carnegie and Bethlehem sizes.

**Beth I Beams**

| Beam | | Flge | F/2+2 |
|---|---|---|---|
| 30" | 120 | 10½ | 7¼ |
| 28" | 105 | 10 | 7 |
| 26" | 90 | 9½ | 6¾ |
| 24" | 104.5 | 9¾ | 6⅞ |
| | 99.5 | 9¾ | 6⅞ |
| | 95.5 | 9¾ | 6⅞ |
| | 84 | 9¼ | 6⅝ |
| | 83 | 9⅛ | 6⅝ |
| | 73 | 9 | 6½ |
| 22" | 71.5 | 8½ | 6¼ |
| | 68.5 | 8½ | 6¼ |
| | 65.5 | 8½ | 6¼ |
| 20" | 82 | 8⅞ | 6½ |
| | 72 | 8¾ | 6⅜ |
| | 69 | 8⅛ | 6⅛ |
| | 64 | 8⅛ | 6 |
| | 59 | 8 | 6 |
| 18" | 74 | 8¾ | 6⅜ |
| | 69 | 8¾ | 6⅜ |
| | 64.5 | 8¾ | 6⅜ |
| | 59 | 7¾ | 5⅞ |
| | 54 | 7⅝ | 5⅞ |
| | 52 | 7⅝ | 5¾ |
| | 48.5 | 7½ | 5¾ |
| 15" | 71 | 7½ | 5¾ |
| | 64 | 7¼ | 5⅝ |
| | 54 | 7 | 5½ |
| | 46 | 6⅞ | 5⅜ |
| | 41 | 6¾ | 5⅜ |
| | 38 | 6⅝ | 5⅜ |
| 12" | 36 | 6⅜ | 5⅛ |
| | 32 | 6¼ | 5⅛ |
| | 28.5 | 6⅛ | 5⅛ |
| 10" | 28.5 | 6 | 5 |
| | 23.5 | 5⅞ | 5 |

**Carnegie Spec. Is.**

| Beam | | Flge | F/2+2 |
|---|---|---|---|
| 27" | 90 | 9 | 6½ |
| 24" | 74 | 9 | 6½ |
| 21" | 60.5 | 8¼ | 6⅛ |
| 18" | 48 | 7½ | 5¾ |
| 15" | 37.5 | 6¾ | 5⅜ |
| 12" | 28 | 6 | 5 |
| 10" | 22.25 | 5½ | 4¾ |
| 8" | 17.5 | 5 | 4½ |

**Beth. Girders**

| Girder | | Flge | F/2+2 |
|---|---|---|---|
| 30" | 200 | 15 | 9½ |
| | 180 | 13 | 8½ |
| 28" | 180 | 14⅜ | 9¼ |
| | 165 | 12½ | 8¼ |
| 26" | 160 | 13⅝ | 8⅞ |
| | 150 | 12 | 8 |
| 24" | 140 | 13 | 8½ |
| | 120 | 12 | 8 |
| 20" | 140 | 12½ | 8¼ |
| | 112 | 12 | 8 |
| 18" | 92 | 11½ | 7¾ |
| 15" | 140 | 11¾ | 7⅞ |
| | 104 | 11¼ | 7⅝ |
| | 73 | 10½ | 7¼ |
| 12" | 70 | 10 | 7 |
| | 55 | 9¾ | 6⅞ |
| 10" | 44 | 9 | 6½ |
| 9" | 38 | 8½ | 6¼ |
| 8" | 32.5 | 8 | 6 |

**Channels**

| Channel | | Flge | F+2 |
|---|---|---|---|
| 15" | 55 | 3⅞ | 5⅞ |
| | 50 | 3¾ | 5¾ |
| | 45 | 3⅝ | 5⅝ |
| | 40 | 3½ | 5½ |
| | 35 | 3½ | 5½ |
| | 33.9 | 3½ | 5½ |
| 12" | 40 | 3½ | 5½ |
| | 35 | 3⅜ | 5⅜ |
| | 30 | 3¼ | 5¼ |
| | 25 | 3⅛ | 5⅛ |
| | 20.7 | 3 | 5 |
| 10" | 30 | 3 | 5 |
| | 25 | 2⅞ | 4⅞ |
| | 20 | 2¾ | 4¾ |
| | 15.3 | 2⅝ | 4⅝ |
| 9" | 13.4 | 2½ | 4½ |
| 8" | 11.5 | 2¼ | 4¼ |
| 7" | 9.8 | 2⅛ | 4⅛ |
| 6" | 8.2 | 2 | 4 |
| 5" | 6.7 | 1¾ | 3¾ |
| 4" | 5.4 | 1⅝ | 3⅝ |
| 3" | 4.1 | 1½ | 3½ |

**Carnegie I Beams**

| Beam | | Flge | F/2+2 |
|---|---|---|---|
| 24" | 115 | 8 | 6 |
| | 110 | 8 | 6 |
| | 105.9 | 7⅞ | 6 |
| | 100 | 7¼ | 5⅝ |
| | 95 | 7¼ | 5⅝ |
| | 90 | 7⅛ | 5⅝ |
| | 85 | 7⅛ | 5½ |
| | 79.9 | 7 | 5½ |
| 20" | 100 | 7¼ | 5⅝ |
| | 95 | 7¼ | 5⅝ |
| | 90 | 7⅛ | 5⅝ |
| | 85 | 7⅛ | 5½ |
| | 81.4 | 7 | 5½ |
| | 75 | 6⅜ | 5¼ |
| | 70 | 6⅜ | 5¼ |
| | 65.4 | 6¼ | 5⅛ |
| 18" | 90 | 7¼ | 5⅝ |
| | 85 | 7¼ | 5⅝ |
| | 80 | 7⅛ | 5⅝ |
| | 75 | 7 | 5½ |
| | 70 | 6¼ | 5⅛ |
| | 65 | 6¼ | 5⅛ |
| | 60 | 6⅛ | 5⅛ |
| | 54.7 | 6 | 5 |
| 15" | 70 | 6¼ | 5⅛ |
| | 65 | 6⅛ | 5⅛ |
| | 60.8 | 6 | 5 |
| | 55 | 5¾ | 4⅞ |
| | 50 | 5⅝ | 4⅞ |
| | 45 | 5⅝ | 4¾ |
| | 42.9 | 5½ | 4¾ |
| 12" | 50 | 5½ | 4¾ |
| | 45 | 5⅜ | 4¾ |
| | 40.8 | 5¼ | 4⅝ |
| | 35 | 5⅛ | 4⅝ |
| | 31.8 | 5 | 4½ |
| 10" | 35 | 5 | 4½ |
| | 30 | 4⅞ | 4⅜ |
| | 25.4 | 4⅝ | 4⅜ |
| 9" | 21.8 | 4⅜ | 4¼ |
| 8" | 18.4 | 4 | 4 |
| 7" | 15.3 | 3⅝ | 3⅞ |
| 6" | 12.5 | 3⅜ | 3¾ |
| 5" | 10 | 3 | 3½ |
| 4" | 7.7 | 2¾ | 3⅜ |
| 3" | 5.7 | 2⅜ | 3¼ |

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## Factory Lighting Code

THE Code of Lighting for factory mills and other work places, based upon earlier codes issued by the Illuminating Society and recently revised by a sectional committee under the sponsorship of this society has been officially approved as American Standard by the American Engineering Standards Committee.

The Code was first issued by the I. E. S. in 1915 and was revised slightly in 1918. Since June, 1920, the revision of the code has been carried out under the rules of procedure of the American Engineering Standards Committee. It is very brief, consisting of a few rules covering the minimum requirements, from the point of view of safety, for the illumination of traverse spaces during the time of use, methods for the avoidance of glare, and for exit and emergency lighting. Supplementary to the code are numerous suggestions relative to illumination values considered desirable for different classes of work and an outline of the advantages of good lighting.

State lighting laws based upon the I. E. S. code have already been put into effect in Pennsylvania, New Jersey, New York, Wisconsin, Oregon, California and Ohio. The adoption of the code is now under consideration in several other states. Copies may be secured from the American Engineering Standards Committee, 29 West 39th Street, New York City.

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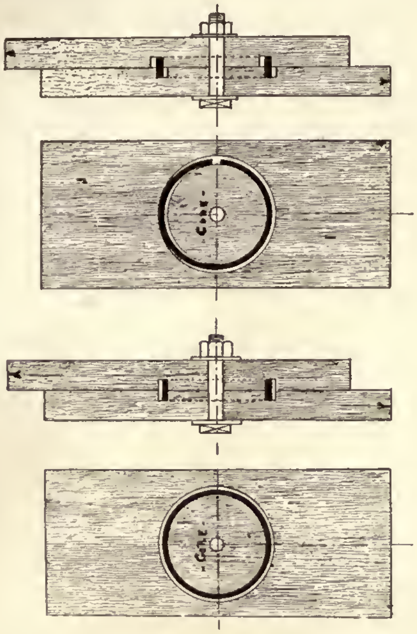
## Ring Dowel for Timber Trusses

OUT of Germany comes a new idea in the framing of timber trusses, a ring dowel, shown in the accompanying cut. In order that it may at all times fit closely against all bearing surfaces, the ring is cut through on one side. Changes in the direction of stress, caused by shrinkage or any other movement in the timbers, has no effect upon the ring dowel for the cut makes it elastic. A special machine is used for cutting grooves into which the rings fit. A groove is cut in each timber one-half the width of the ring in depth and with a width equal to the thickness of the ring, so the fit is snug. In the cut the width of groove is exaggerated in order to show the advantage gained by cutting the ring.

The idea is excellent and will simplify the framing of timber trusses, making the design and erection almost as simple as similar operations in connection with steel work. The cutting of the grooves and insertion of the ring dowels costs much less than the cutting and fitting of shear pins and bolts.

The center of stresses in each member passes through the center of the ring into which the dowel is fitted and a bolt holds the pieces together. It is said that in Germany the friction on the faces of the members is recognized as effective but this is not allowed in American specifications, so the bolt cannot be fitted as tightly as it might be if the friction were to count. The friction may be considered as being merely adventitious. The convenience of the device and the great reduction in cost it effects will make it popular, but its use



Ring dowel for timber trusses. Width of groove exaggerated to show advantage of split dowel

in no wise changes any of the fundamental principles underlying the design of trusses.

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### Strength of Thin Walls

IT would be a brave man who dared suggest the use anywhere in the United States, of brick bearing walls having a thickness of less than eight inches. In fact it requires considerable courage to advocate the use of eight inch walls. In England according to *The Architects' Journal,* London, of January 11, experiments were carried out for the Building Materials Research Committee on the stability of walls from 2⅝ in. to 4½ in. thick. The tests were made to obtain helpful data for the large housing schemes in contemplation by the Government.

It was generally realized that the actual stability of unsupported walls only a few inches thick was very small, and that such walls in practice always received support either at the top or sides or both. It appeared, therefore, to the Committee that the most practical method of attacking the problem was to ascertain the breaking strength of typical walls when subjected to crushing loads and horizontal pressure applied to the walls while held at the top and bottom. This would correspond roughly to a wall having in it two door openings, the strength of a wall with no openings being somewhat greater.

It was found possible to secure the use of a hydraulic testing machine which was capable of crushing short walls 8 ft. 6 in. high, which is about the height between floors in a building of the cottage type. The investigation was conducted under the direction of Dr. Oscar Faber.

Tests were made on several commonly used materials, and each material was loaded to destruction in three ways:—

1. Small cubes, generally 6 or 9 in. square, were crushed in order to ascertain the strength of the material when not used as a thin structure.

2. Columns or pillars, 14 in. wide, from 2⅝ in. to 4½ in. thick and 8 ft. 6 in. high. These narrow, thin walls or pillars were crushed, and their relative strengths compared with that of the cubes.

3. Short lengths of wall, 3 ft. 6 in. wide, from 2⅝ in. to 4½ in. thick and 8 ft. 6 in. high, were subjected to a vertical load of about one ton per lineal foot of wall. While thus loaded, a horizontal pull was applied to the wall at the middle of its height until failure took place.

The principal facts brought out are the high relative resistance to crushing shown by the slender walls or pillars, and the weakness of lime mortar compared with Portland cement mortar when tested in this way. The crushing strength of walls laid up in Portland cement mortar varied from 67 to 83 per cent of the strength of the same material crushed in cubes. The lime mortar only showed 30 per cent. The high percentage strength is to some extent due to the care exercised in centering the column under test. The commentator states that strengths approaching these can be developed in practice, provided care is exercised in the bedding of joists, so that the load acts as nearly as possible through the center of the wall. It is also necessary that the wall should be absolutely vertical. Monolithic walls and walls composed of large units show a high resistance to the transverse loads as compared with walls formed from smaller units such as bricks. Walls of brick on edge, 2⅝ in. thick, laid up in cement mortar were found to be much stronger than walls 4½ in. thick laid up in lime mortar. The horizontal stress applied would naturally cause bending, to resist which requires a strong mortar.

In the review, freely quoted above, no mention is made of the amount of transverse load required to destroy any wall and nothing is said about the conclusions reached by the experimenters as to the value of such thin building walls. These data no doubt are given in the report which is sold by the Government for sixpence the copy. It requires highly skilled men to lay up such thin walls and the output per day per man decreases more rapidly than the decrease in wall thickness. No matter how successful such experiments may be, the saving in material will ordinarily be more than offset by increase in cost of labor as between a 4 in. and an 8 in. wall and no question exists as to which is the better.

## A New Type of Garage

By Harold F. Blanchard

THE Nelson House Garage, Poughkeepsie, New York, presents an interesting departure from common practice in the design of public garages. The building is divided vertically into two sections, the floors being so arranged that those

Nelson House Garage, Poughkeepsie, N. Y.
Edward C. Smith, Architect

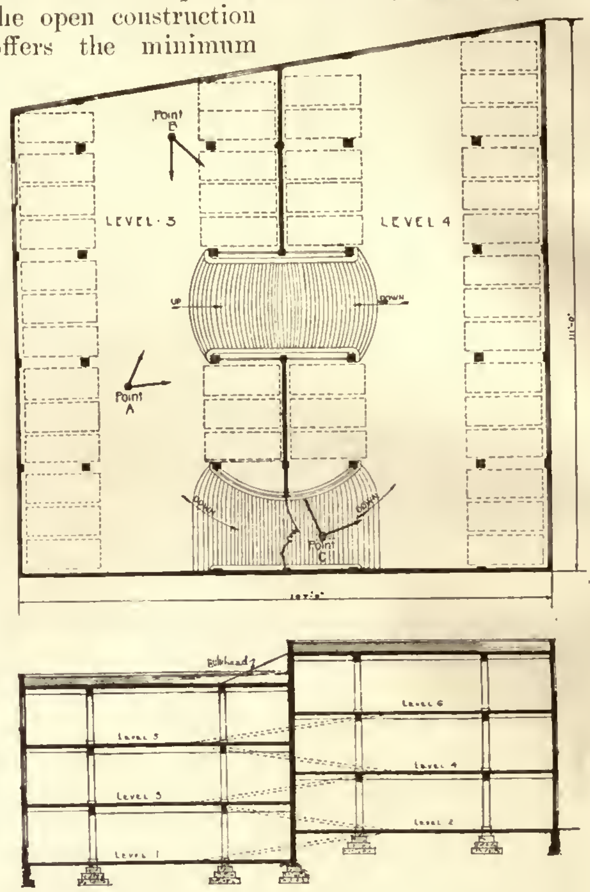
in one section are half a story higher than the floors in the other section. The arrangement is plainly shown in the accompanying section and in

Interior of garage. All floors alike. View from point B

the cut of the building the light colored concrete columns and spandrel beams are plainly outlined on the brick walls.

Before erecting the building a study was made of methods in use elsewhere and the advantages were all with the method finally adopted, in spite of the fact that it is patented. The claim is made that by staggering the floors the maximum convenience was obtained and the storage capacity was greater than it would have been with an elevator and no ramps.

The ramp with staggered floors occupies the same place on each floor, whereas the common form of ramp varies in location from floor to floor. The ramps are short, the grades easy, and the open construction offers the minimum




Plan and cross-section of the Nelson House Garage

obstruction to light. The idea is good and has been well worked out.

The basis of the design is car storage space. A floor plan was drawn for a one story garage occupying the lot. Outlines were drawn of cars in storage. On transparent material was drawn an elevator platform to the same scale. Superimposing this drawing over the inked drawing the space required for an elevator was immediately demonstrated in terms of stored cars. Another drawing was made for typical ramps and a similar procedure followed. A study was made to compare the cost of operating the elevator with the loss of revenue from car storage space absorbed by long ramps. The elevator was cheaper and might have been installed when the idea was advanced of making the building in two sections with staggered floors. The idea was simple and put into effect has proven to be practical. Reinforced concrete was chosen for the structural framing and floors because it is fireproof.

# BRICK WALLS FOR RESIDENCES

## A Discussion of Proposed Relaxation of Requirements as Influenced by a Loose Construction of the Term "Residence"

BY CHARLES E. WORTHINGTON
*(Member N. F. P. A.)*

*The building industry is in the throes of a campaign of education. The moving cause is the organization by Secretary Hoover of a committee to prepare a national building code to standardize without hobbling progress all requirements capable of standardization. The present article, reprinted from The Quarterly, January 1922, of the National Fire Protection Association, discusses brick walls from the point of view of the specialist in fire protection. His reference to a publication issued by brick manufacturers guides the reader to sources of information of great value. The changing character of occupancy is an important factor entering into the consideration of many items dealt with in building codes. Does this not indicate that zoning laws and city planning are basic and really should precede, if they do not form part of, all regulations for the construction of buildings?—Editors.*

THE appointment by Secretary Hoover of the Department of Commerce of the excellent committee to consider the standardization of Building Codes serves among other things to bring into prominence the plea of the Common Brick Manufacturers' Association for a modification of accepted brick wall construction, especially the requirement of twelve inch walls in certain cases.

This plea, brought forward by Architect William Carver in a carefully prepared and well illustrated booklet, is presented in a temperate and thoughtful manner; it represents at least their point of view fully and appears in the main to have anticipated and answered much possible criticism. This book although covering more fully the subject of the small folder recently mailed to members of the N. F. P. A. is a paper bound volume* too bulky and expensive to be distributed indiscriminately. It contains much valuable tabulated information and records of tests not previously brought together, although it is advertising matter in the sense that its design is the promotion of the brick making and building industries.

The advocacy of what the author terms the "Ideal Rolok Wall" is one of the main purposes. This method of construction consists in general of laying the brick on edge, breaking joints and laying each alternate brick through the wall, the surface of which thus presents the flat sides and ends successively in each course; this is an 8-inch wall providing a central air space.

This method of construction is not a novelty in some parts of Europe and is not unpleasing in appearance, but the determination of its merit is not the purpose of this discussion.

It is notable in this case that unlike the majority of such pleas, concession for special construction is asked only for a specific class of buildings. Questions of this nature have usually been settled by obtaining the concensus of opinion of a considerable number of persons reputed to be qualified to speak by reason of occupation, education or special experience (a sort of limited referendum), and the adoption of substantially the method favored by the majority, especially if the majority appears to be a decisive one. This method in this case is apparently impracticable from the fact that it is the prevailing concensus of opinion that is put on trial, and an accused cannot well be constituted judge and jury to try his own case.

Concensus here means in the main the voicing of fixed opinions, largely acquired from custom or inheritance, but difficult to change; opinions not always to be influenced by evidence and not always dependent upon other than superficial views. In such a case even an overwhelming majority may render a verdict not in accordance with fundamental facts and it might be far safer to call for thorough scientific tests and experiments, disregarding preconceived opinions, and relegate the decision mainly, if not entirely, to such competent and disinterested bodies as the United States Bureau of Standards and the Underwriters' Laboratories.

This determination affects not merely the brick makers but is vital in the matter of the housing shortage; one of our most pressing economic problems. The housing shortage must, however, be taken as a shortage of homes, a condition calling for the promptest practicable relief for individual home builders but not applicable to speculative or commercial building construction.

The plea of the Brick Manufacturers' Association as expressed by Mr. Carver is only for the sanction of eight inch exterior walls of hollow construction ("Ideal Rolok Construction") for small residences wherever located, not for buildings designed for mercantile uses or for apart-

**Brick. How to Build and Estimate. Common Brick Manufacturers' Association of America, Cleveland, Ohio.*

ment houses. And since the maximum height of side walls for a moderate sized residence or two family tenement will never exceed twenty feet (nor the average of the gable walls twenty-five feet), and the length of such walls may be restricted to a maximum of about fifty feet without in the least impairing the purpose in view, there may be some features of this plea worthy of very careful if not favorable consideration.

OUR building codes in general appear to base wall thickness upon permissible floor load and fire hazard, stopping, however, at a floor load suitable for light mercantile use of 125 pounds per square foot, making no concessions for lighter loads, and drawing no distinction between the necessary thickness of fire walls and exterior walls not in contact with others.

It is notable as a factor in this discussion that Mr. Carver's book insists upon a twelve inch minimum for fire walls and party walls and upon solid brick construction for such, realizing the necessity of at least four inches of brick between the ends of joists or timbers. The need of this restriction should be evident although it does not seem to be considered at all in some codes where eight inch walls are permitted, no distinction being drawn between exterior walls and others. This should be stated here in justice to the proponents.

But, in event of fire the thrust which collapses a wall is not only determined by expansion, (height and length) but by the floor load within, and all other conditions being equal a wall may collapse under a load of 125 pounds that would safely pass the ordeal with fifty pounds. Hence while we will universally concede the twelve inch minimum for party or fire walls, it is by no means certain that this requirement should be uniform for loads under and above 125 pounds. That which is quite adequate for a residence of 2½ stories (20 feet high) may not suffice for a tenement wall of 3 stories or 30 feet.

Moreover sanitation requires isolation of residences to some extent for light and air. Where such are necessarily built in rows there is ample spacing front and rear, a condition not applying at all to mercantile construction and enforceable only to a limited degree in case of tenements (sometimes called apartment houses for euphony or to escape sanitary restrictions otherwise imposed.)

This spacing is important from an economic point of view, for in the so-called "congested districts" the cost of the land makes it imperative that the structure shall cover practically the entire area in order that financial return shall be adequate.

As an extreme example, suppose when the Equitable Building on Broadway, New York, burned, the State of New York had passed an act abrogating fire limit restrictions on this property and authorized the erection of wooden dwellings on the site, restricting, however, the size to 1500 sq. ft. of area, height to 2½ stories and providing a minimum spacing of 10 ft. on both sides to lot lines, 40 ft. in rear and a 50 ft. "set back." Does anyone dream that advantage of this permission would or could have been taken and buildings of very limited rental value erected upon land whose cost not only compels the utilization of every inch of area but demands vertical expansion of twenty or more stories in order to get rental spaces sufficient to return any interest on the investment?

This "congested district" argument is sometimes put forward by commercial or speculative interests with the object of increasing the permitted height limit to above 20 feet, and length to more than 50 feet; increases that would let in mercantile construction with its more than double floor loads, large areas and much greater volume of combustible material. As a matter of fact no one is at all likely to *desire* to build a residence in a congested mercantile district and if there should be such a person at occasional intervals financial considerations would restrain him.

PRESENT building conditions, reached by years of effort, cannot yet be called ideal. We have yet too much light brick construction, particularly in hotels and tenements ("apartment houses") of all classes, the permitted construction of "apartment houses" in particular having long been a common target for criticism. There appears to be, with the sole exception of small residences, no economic or other conditions that even remotely suggest "downward revision" of building requirements in any particular, although "upward revision" is desirable in many cases and particulars; and it may be added that no other class of buildings than residences of small height and area can be at present provided for by practicable legislation so as automatically to regulate the matter of fire protection.

Before taking up the reverse of the shield a little consideration of the housing shortage may be desirable.

*(To be Continued)*

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**Annual Meeting A. S. T. M.**

THE Twenty-fifth Annual Meeting of the American Society for Testing Materials will be held from June 26 to July 1, 1922, at Atlantic City, N. J., with headquarters at Chalfonte-Haddon Hall Hotel. Address C. L. Warwick, Secretary Treasurer, 1315 Spruce St., Philadelphia. Pa.

# THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago, Ill.



The American Architect and The Architectural Review *has gratuitously set apart this section for use by The American Specification Institute.*

*The Editors and Publishers assume no responsibility for any statements made, or opinions expressed.*

*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review.

### Bulletins

THE preparation of Bulletin No. 6 was considered one of the important phases of the Institute activities and its importance is emphasized by reason of the great amount of discussion that is now being had respecting the Progress Report of the Joint Committee. As stated in the Preface to Bulletin No. 6, "The specification is based on and follows very closely the Progress Report of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete." The major portion of the specification is not new but is a compilation of the best standard practice. It varies from the usual specification in the manner of proportioning the concrete. This proportioning is based on tables in "Quantities of Materials for Concrete and a Given Compressive Strength," of the Structural Materials Research Laboratory, Chicago. The measure of consistency, or workability upon which the proportions are based, is determined by the "slump test." Further, as stated in the "Preface," the attention of the membership is called to the arrangement of this tentative specification in parallel columns. The right-hand column consists of questions and explanatory notes that each member is requested to consider. These questions and notes are indicative, to some extent, of the admittedly incomplete paragraph to which each item refers. It is hoped that each member will give the Institute his experience and judgment on these points as well as on any others that he may select.

Considered as a part of Bulletin No. 6, although they bear separate bulletin numbers, will be found Bulletin No. 9, "Standard Specification for Reinforcing Steel," and Bulletin No. 10, "Standard Specification for Testing." The following comprises an outline of Bulletins No. 6, 9 and 10.

### Standard Specifications for Concrete and Reinforced Concrete

(1) Types of Concrete
(2) Portions

#### Concrete Materials

(3) Portland Cement
(4) Fine Aggregate
(5) Grading
(6) Sieve Analysis
(7) Decantation Test
(8) Organic Impurities
(9) Coarse Aggregate
(10) Crushed Slag
(11) Grading
(12) Sieve Analysis
(13) Aggregate Storage
(14) Water

#### Proportioning Concrete

(15) Unit of Measure
(16) Method of Measuring
(17) Determination of Proportions
(18) Increase of Cement Ratio
(19) Change of Aggregate Ratios

#### Consistency of Concrete

(20) Consistency
(21) Compensation for Additional Cement
(22) Slump Tests

#### Test Specimens

(23) Compression Test Specimens
(24) Number of Specimens
(25) Moulds
(26) Mixing Machine
(27) Time of Mixing
(28) Retempering

### Depositing Concrete

(29) Cleaning Mixer and Equipment
(30) Approval
(31) Handling
(32) Compacting
(33) Removal of Water
(34) Protection
(35) Cold Weather
(36) Depositing Continuously
(37) Bonding

### Depositing Concrete Under Water

(38) General
(39) Proportions
(40) Coffer Dams
(41) Depositing Continuously
(42) Laitance

### Forms

(43) General
(44) Design
(45) Fabrication
(46) Moldings
(47) Inspection of Forms
(48) Removal of Forms

### Details of Construction

(49) Cleaning
(50) Bending
(51) Straightening
(52) Placing
(53) Offsets in Column Reinforcement
(54) Future Bonding
(55) Construction Joints
(56) Joints in Columns
(57) Joints in Floors
(58) Monolithic Construction
(59) Expansion Joints

### Surface Finish

(60) General
(61) Top Surfaces Not Subject to Wear
(62) Wearing Surfaces
(63) Curing
(64) Concrete Stairs
(65) Roof Surfaces on Cinder Fill
(66) Expansion Joints in Roof Surfaces
(67) Terrazzo Finish
(68) Surfacing
(69) Preparation for Terrazzo

### Standard Specification for Reinforcing Steel

(1) Bars
(2) Wire
(3) Area
(4) Testing Machine
(5) Column Spirals

### Standard Specification for Testing

(1) Testing Laboratory
(2) Molds and Sieves
(3) Reports

Members are requested to send in other suggestions and criticisms on Bulletin No. 6 at their earliest convenience so that a revision of this Bulletin may be prepared at an early date.

### Annual Winter Conference

The Annual Winter Conference was held on the Evening of February 10 at the Chicago Engineers' Club with a most gratifying attendance. A report of the proceedings will be published in these columns in the issue of March 1.

### Advisory Committee

The Chairman of the Advisory Committee, R. J. Gaudy, has appointed the following members of The Institute as members of his Committee in addition to those announced previously:

Mr. Harry B. Wheelock, Birmingham, Ala.
Mr. Seymour H. Knight, Philadelphia, Pa.

Subject to later revision the Board of Governors has divided the country into districts, the center of each district being a city in which a member of the Advisory Committee is resident. This division is as follows:

### Advisory Committee Districts

1. Boston
   Maine
   New Hampshire
   Vermont
   Massachusetts
   Connecticut
   Rhode Island
2. New York City
   New York
   New Jersey
3. Philadelphia
   Eastern Half of Pennsylvania
   Virginia
   Maryland
   Delaware
   District of Columbia
4. Pittsburgh
   Western Half of Pennsylvania
   Western Virginia
   Tennessee
   Alabama
   Mississippi
5. Detroit
   Lower Michigan
   Ohio
6. Chicago
   Indiana
   Illinois
   Kentucky
   Iowa
   Nebraska
   Colorado
   Wyoming
   Foreign
7. Minneapolis
   Wisconsin
   Minnesota
   Upper Michigan
   North Dakota
   South Dakota
   Montana
8. Saint Louis
   Missouri
   Arkansas
   Louisiana
   Kansas
   Oklahoma
   Texas
   New Mexico
9. San Francisco
   Washington
   Idaho
   Oregon
   Utah
   Nevada
   California
   Arizona
10. Birmingham
    North Carolina
    South Carolina
    Georgia
    Florida
11. Toronto
    All Canada

### New Members

The following new members have been elected.
Frank Mason Harris, Engineer, San Francisco.
Albert G. Hopkins, Architect, Boston.
Charles F. Plummer, Architect, Los Angeles.

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MONUMENT OF COUNT UGO, LA BADIA, FLORENCE, ITALY

MINO DA FIESOLE

*(For measured drawings see pages 172—173)*

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# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, MARCH 1, 1922 NUMBER 2388

# ARCHITECTURAL EDUCATION

## PART 1—THE SCHOOLS

BY C. H. BLACKALL, F. A. I. A.

THE teaching of architecture in special technical schools has been in operation in this country since 1875. The schools have been working intelligently, faithfully and untiringly and are turning out an increasing number year by year of young men who come to us for employment. Very seldom does an architectural student pass directly into a partnership or an independent business. He admittedly is only partially prepared for actual work when he receives his diploma, and he looks forward to a term of years before he can call himself a full fledged architect. Inasmuch, therefore, as the schools are direct feeders of the architects' offices, and inasmuch as the graduates of the school look to the offices for their post graduate opportunities, we have a right to expect that the young men shall be available for our purposes. The serious question, then, is, do the architectural schools educate?

There are two distinct categories of architectural schools. The first undertakes to train subjectively, endeavoring to prepare a young man for earning good wages at once, this category including institutions like the Y. M. C. A., some of the technical schools, and what we would class in general as second rate architectural schools. The second considers that the training should be wholly objective, that the young man should have a grounding which will enable him, more or less later in life, to become a practicing architect, and that the school training as such need not encumber itself with the subjective topics. This is the point of view which seems to prevail in most of the universities and architectural schools of the highest grade. Both classes start with nothing as far as relates to architecture. The first assumes a man wants to earn at once and will get his culture in practice, while the higher universities assume that culture can best be taught in school and the subjective training acquired in practice.

Now as a matter of personal opinion, neither of the schools turns out just the kind of men the offices want. This may seem a sweeping statement and it is not intended to lessen the value of the excellent work the schools have done, but personal experience as well as frequent discussions of the subject with practicing architects seems to show that the young men who come from our higher schools lack in the very qualities which enable them to profit at once by office experience, and the young men in the lesser schools fail to get the point of view which will enable them to grow in the profession, and are apt to slip back into builders' assistants, engineering draughtsmen and the like. Both points of view are right in a way, and both are wrong in a way. If we try to measure the architectural equipment of most of the young men who come from the architectural schools, and this is not denying there are many brilliant exceptions, we find that these men generally cannot draw in the sense of being independent of mere technique. We find they have many high ideals, plenty of enthusiasm and a very limited power of architectural speech, and they generally come to us with the feeling that they have somehow or other imbibed a mysterious quality which might be termed fundamental culture, by grace of which, though they may stumble in the first few years of their office experience, they will ultimately because of it attain to the goal to which they aspire. Again this is a question of definition and calls for a clear understanding of what are the essentials in an architectural education, for right on that point would seem to pivot the whole scheme by virtue of which an architect is evolved.

While there are abundant exceptions, the rule seems to be that real architectural culture is not really acquired in any of the schools. A young man spends four years in intensive and extensive study. He begins those four years poorly equipped and with no architectural baggage, and by the time his course is run, he is just about beginning to know a little of what he wants. He has reached his real commencement. He will have acquired a critical knowledge, by aid of which he will possibly be able to discriminate wisely between the faults and virtues of the work he sees before him, but this quality is often a handicap, and in this connection one cannot forget the admonition that is so often given to the young men who travel for study abroad, "Don't knock the old masters"—for the average boy who comes out of college is very apt to do just that thing and to assume that because he can be critically discerning, he can, therefore, be intelligently creative, which is a very different thing. The idea of the higher architectural schools is excellent if it were really possible to carry out their programme, and the subjective training of the lower grade of architectural schools certainly is a business help, but fails to take account of that very potent factor in architectural development, the imagination. But judged by its results, the schools which take only the subjective attitude are doing work which ought not to be a part of a man's purely architectural schooling, and the other schools are assuming that culture, however you may define it, can be taught in school. The experience of the whole world is against this latter point of view as we understand it. An architect does not often find himself until many, many years after graduation. The architectural spirit does not come by instruction, but by slow growth and constant exercise, and in assuming that the architectural schools of the higher class are giving the cultural training which of itself enables a man to be an architect in the best meaning of the word, a mistake is made which may require many years of apprenticeship to set right.

Now the teachers with whom this subject has been discussed reply that they are not aiming to train potential draughtsmen but potential architects, and there is the real point of the whole matter. We architects who look to the schools for our recruits do not want potential architects, but we want draughtsmen first and it is our job to make architects out of them. We judge by the product, and however earnest and intelligent the objective teaching may be in the schools, it does not give us what we primarily want, and that is young men who can slip right into line and do our work. Give me a man who can draw, who knows history and can make an intelligent plan, and in the daily round of real practice he will get his culture, will find himself, and will probably do this more quickly, more thoroughly and more efficiently than a man of exactly similar endowment who had gone through the objective training of the school. The real fundamental condition for growth is to know your job and how to handle it. The triumphs come later, and the air castles will come after we have trod the path of the architectural draughtsman.

It would be unfair to say all this without at least indicating some way by which what we want might be achieved, with the existing agencies. Excellent as the product of the schools now is, we feel it can be made a great deal better and more readily available, and it is the province of the architect to tell the schools frankly what is wanted in the profession, and then as far as possible, see that the schools give it. It would not require such a sweeping change in the methods of training. Primarily give up the idea that the polishing necessary to real culture can be acquired in school better than it can be acquired in practice. Then relieve the burden of the existing schools by a more careful selection of candidates, following the famous recipe for cooking hare,—"first find your man"—and require that nobody shall be eligible for an architectural school unless he can draw, not merely mechanical drawing but a certain amount of freehand drawing as well, so that he starts on his career without the handicap of not knowing the language. Also require all applicants for a course to be grounded in the elements of architectural history so that this work in its dry details can be kept out of the curriculum. Then why not abolish an arbitrary division by years? It has already been done in principle in some of the schools with good success; it ought to be in all of them—and the measure of a man's ability should not be estimated by the length of time he has spent in school. Then beyond this encourage the fraternity spirit by putting all in one big class, much as is done in the ateliers abroad, where the weak draw from the strong, and the strong see their own limitations reflected and the tone of the whole is measured by the best rather than by the average. This is possible, as has been abundantly shown in the few attempts made to introduce the atelier system in our universities. Then from the very first study architectural history not as archæology, not as mere history, but as applied architectural mechanics, and study it not merely in periods but study it in relation to individual problems so that when the young man comes out from the school he can know that in a certain kind of problem he will obtain encouragement and help from a certain kind of historic precedent, and he will not be at a loss to know where to find this precedent. Then there is a study so difficult to define, but which every practitioner must come to in architecture, the practical esthetics of construction, not steel girders, and beams, nor walls, nor foundations, but the constructive sense which enables a man to plan a structure which can be built and to plan it so that the construction is fundamental and vital rather than a mere aggregation of engineering details. And always treat the university or school course as only the first step in education, enabling the student to qualify for the real education of the office.

And finally, through all the course the man should create architecture. If this sounds like a large order, it is not intended as such, for architecture is many sided and the man can begin on the simplest forms, but having in mind always the application of historic precedent to the evolution of orderly, rational planning. If the man's time is filled with just these points,—drawing, history of architecture, esthetics of construction and design to the exclusion of nearly everything else, if he has the real architectural spirit in him, he will come out an efficient helper for a practicing architect. If he has not the real stuff in him, he is not the kind of man that should be considered at all, and no diploma should be given a man until he has demonstrated in his school course that he can draw and can intelligently create and understands History of Architecture. Such things as plumbing, heating, or the multitudinous so-called practical elements can all be safely relegated to the office, or at most taught only in general lines, and the teaching confined to the first months of the student's life, leaving all of his subsequent time free for drawing and design. We do not ask our young men to be proficient in these, we are glad if they are, but they generally have so feeble a smattering of them one cannot help a conviction that the time spent on such studies in college is a sheer waste. We want men who will draw and draw intelligently, and for the rest, we want them to grow up in our lines and get our ideas, improve them if they can, but being our helpers and not objects of personal adornment in the office.

Whatever has been said is not intended as any intimation that the schools are not doing excellent work now. It is simply that the point of view of the practicing architect is seldom presented to them and we have grown into a habit of accepting as final the point of view of the architectural professor. In some respects it is final. Some of the best of them have exactly the views as have been outlined here, but there is need of more emphasis on the necessity for turning out men who can earn their living by helping architects, not some time in the dim future, but right now. No man ever acquired architecture in college. It is a creature of too slow growth for that. We do not expect our boys to fly before they walk, but we want them to come to us able to speak the language and use the tools of their profession.

THE SACRED DRAGON

Designed by Arthur Crisp and executed in Faience

# OBITUARY

## Evarts Tracy

LIEUTENANT COLONEL EVARTS TRACY, D. S. C., died on Tuesday, January 31, after a short illness in Paris, France, while engaged in reconstruction work in the devastated regions around Rheims. A graduate of Yale in the Class of 1890, he studied for three years at the Ecole des Beaux Arts and after a short time in the office of McKim, Mead and White commenced independent practice of his profession in 1896, and formed the firm of Tracy and Swartwout four years later. The work done was extremely varied in character,—some domestic and commercial, but the bulk of it monumental. The Hotel Webster and the Home Club in New York were early examples and of the later work won in competition, the Denver Post Office, the Missouri State Capitol and the Milford Town Hall were the most prominent. The Victory Memorial Building for the George Washington Memorial Association, the cornerstone of which has just been laid, was won in competition in 1914.

Tracy had always a great interest in military affairs, was at Plattsburg for two years and at the outbreak of the war was commissioned Major of Engineers. He served with distinction here and abroad and was in charge of the Camouflage Section and an instructor in camouflage, and has written many articles on that subject. He was promoted to the rank of Lieutenant Colonel and was recently awarded the Distinguished Service Cross. Personally Tracy was a very lovable character. At college he was the most popular man in his class and in his profession and in the Army he was the friend of everyone who knew him, and he knew everybody. He was at home everywhere and was vitally interested in everything that went on. His specialty, as he often said, was miscellaneous information. There was not a subject on which he could not converse intelligently; with the medical profession he talked like a doctor and among lawyers he would pass as a lawyer, and when he entered the Army it seemed as if he had been a soldier all his life. He liked it and he looked it, and he gave his life to it, for the fatal attack of heart disease which carried him off in the midst of his reconstruction work was directly attributable to an accident in a trench at the Front. He lived his life to the full and he enjoyed every minute of it. He died as he would have wished to die, in the vigor of life and in the midst of the work he had loved. He was a man and a lovable man, and the fact of having known him is a pleasant memory.

## Austin W. Lord

AUSTIN WILLARD LORD, architect, member of the architectural firm of Lord & Hewlett, 2 West 45th Street, New York City is dead. Mr. Lord spent three years in architects' offices in Minneapolis, and after studying at the Massachusetts Institute of Technology received in 1888 the Rotch Scholarship with a two years' trip abroad. He was director of the American School at Rome from 1894 to 1896. He was also formerly director of the School of Architecture at Columbia University, New York City. He was architect of the Isthmian Canal Commission in 1912, chairman of the City Plan Committee of Columbus, Ohio, and designer of many important structures, among them being Senator Clark's house on Fifth Avenue, New York City.

## William Henry Miller

ANNOUNCEMENT is made of the recent death in Miami, Fla., of William Henry Miller, architect, who had been spending the winter there. Since 1870 Mr. Miller practiced his profession in Ithaca, N. Y., where there can be found many churches and private residences designed by him, as well as many of the university buildings. Examples of his work are also found in Chicago, New York, Boston, Washington, Albany, Rochester, and many other large cities throughout the country.

# Beaux-Arts Institute of Design

Director of the Institute, LLOYD WARREN

Architecture, RAYMOND M. HOOD — Sculpture, JOHN GREGORY
Interior Decoration, ERNEST F. TYLER — Mural Painting, ERNEST C. PEIXOTTO

Official Notification of Awards—
Judgment of June 7th, 1921

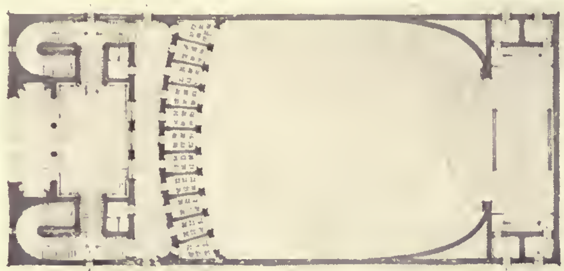
## PROGRAM

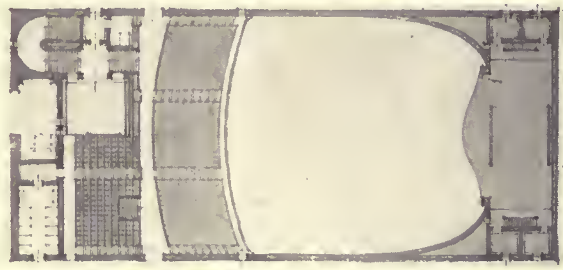
### CLASS "B"—V ANALYTIQUE

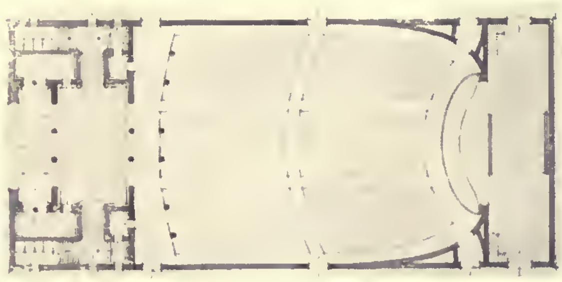
The Committee on Architecture proposes as subject of this Competition:

"A TWO STORIED PORTICO"

The owners of an important business building on the main thoroughfare of a large city have decided, in order to give dignity and importance to the building, to make the entrance in the form of a recessed portico, running through two stories.





L. B. Christman — Carnegie Institute of Technology

1st MENTION PLACED
Class "B"—V. Projet—A Moving Picture Theatre

The inside length of the portico shall not exceed 35'-0", and its depth from the face of the building to the face of the back wall of the portico shall not exceed 15'-0". The interior height of the portico shall not exceed 30'-0", its floor being approximately at the street level. The columns or motifs supporting the front wall of the building shall not project more than 1'-0" beyond the face of the building.

One of the classic orders shall be used in the development of the motif forming the portico.

*Jury of Awards:*—H. O. Milliken, J. W. Cross, H. R. Sedgwick, W. Emerson, H. C. Ingalls and J. F. Harbeson.

*Number of Drawings Submitted:*—139.

AWARDS:

FIRST MENTIONED PLACED:—H. S. Torbett, Carnegie Inst. of Tech.

FIRST MENTION:—C. Forrester, Atelier Corbett-Gugler, N. Y. C.; F. L. Soars, George Washington Univ.; L. Hauf, Jr., "T" Square Club, Phila.; H. Compton, Univ. of Kansas; E. Galante, Atelier Wynkoop, N. Y. C.; R. W. Ramsdell, Yale Univ.

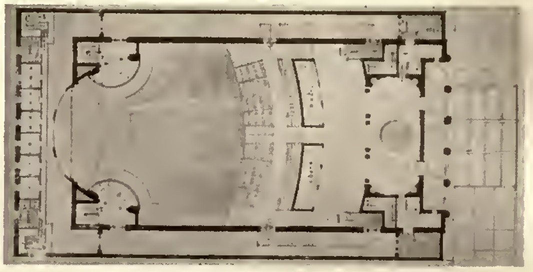
MENTION:—J. S. Crytzer, Boston Archtl. Club; C. H. Disque, Cincinnati Archtl. Soc.; H. Johnson, Atelier Cairns, Memphis; G. D. Schade, V. A. McGowan, J. S. Wood, M. A. Brace, B. H. Lawson, W. Z. Bane, E. M. Russell, M. B. Parker, A. B. Lowstuter, A. M. Felstein and K. O. Sonneman, Carnegie Inst. of Tech.; C. E. Sheffield, Atelier Denver; C. M. Woodward, F. A. Elliott, Dorothy Sigman, C. L. Nutt, W. F. Harvey, C. W. Jones and L. Chatelain, Jr., George Washington Univ.; O. L.

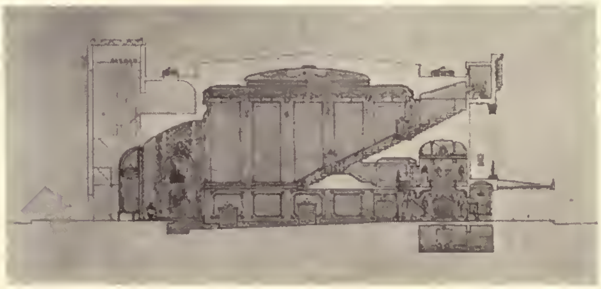
Warady, A. F. Euston and H. W. Naylor, Atelier Hirons, N. Y. C.; D. Jansen, L. H. Schofield and J. Delmissier, John Huntington Poly. Inst., Cleveland; J. Daniels, Los Angeles Archtl. Club; B. L. Schlanger, Harlem Even. High Sch., N. Y. C.; E. Leveque, C. K. Kruchten and F. Eiseman, Atelier Parsons-Chic. Archtl. Club; C. I. Cromwell and J. Wassum, Syracuse Univ.; H. S. Shaw, W. H. Lewis and W. M. Haslett, "T" Square Club, Phila.; O. Nicholson, Eva McCanles, A. A. Graves, Jr., G. Beal and F. X. Thorne, Univ. of Kansas; A. E. Fulton, J. C. Jordon, F. Tai Lau, V. L. Annis, V. C. Edades and D. T. Lopp, Univ. of Washington; W. K. Cooper, R. N. Waters, E. F. Webster, V. D. Phenix, E. H. Sammons and C. C. Wright, Univ. of Texas; A. D. Baker, R. H. Crawford and D. L. R. Bartels, Univ. of Southern California; G. M. Wolff and J. M. Bradway, Univ. of Oregon; L. A. Gudebrod, Yale Univ.

control, convenience of the patrons, and economy of operation and space shall be as great as possible. Exit courts not less than 10'-0" wide, open to the sky, shall be left at each side of the building, and sufficient exits shall be provided so that the theatre can be emptied within three minutes.

In studying the seating capacity of the theatre, while it is of importance that this shall be as large as possible, at the same time it should be remembered that a good view of the screen from every seat is essential, and that the comfort and convenience of the patrons should not be sacrificed. A certain number of the higher priced seats shall be provided in loggias or open boxes, either on the floor or in the balcony, and a space reserved for "standing room."

*Jury of Awards:*—R. M. Hood, F. A. Godley, F. C. Hirons, E. V. Meeks, H. B. Herts, W. VanAlen, H. C.





1st MENTION PLACED

H. Van der Lyn

Atelier Hirons, New York City

Class "B"—V. Projet—A Moving Picture Theatre

PROGRAM

CLASS "B"—V PROJET

The Committee on Architecture proposes as subject of this Competition:

"A MOVING PICTURE THEATRE"

A moving picture theatre is to be built on a level rectangular plot having a frontage of 100'-0" on an important street and a depth of 175'-0". The purpose of this theatre is naturally the showing of moving pictures, but at the same time an orchestra and other forms of entertainment will be used in conjunction with the pictures, and in the study of the problem, the following provisions should be made to this effect.

The stage behind the curtain upon which the projections are thrown shall have a depth of approximately 20'-0", and in connection with this stage there shall be dressing rooms and other accessories. In front of the curtain a space for an orchestra of twenty (20) musicians shall be provided.

The ticket office, lobbies, staircases, offices, smoking and toilet rooms, etc., shall be so arranged that the

Butler, W. K. Rainsford, H. W. Gardner and A. E. Flanagan.

*Number of Drawings Submitted:*—168.

AWARDS:—

FIRST MENTION PLACED:—L. B. Christman, J. M. Franklin, Carnegie Inst. of Tech.; H. Van Der Lyn, Atelier Hirons, N. Y. C.

FIRST MENTION:—C. Landefeld, J. W. Minick, E. O. Anderson, J. C. Topnick, E. W. Klee, Carnegie Inst. of Tech.; W. Conley, Columbia Univ.; A. E. Thomas, Dallas Archtl. Club; R. L. Linder, Atelier Denver; J. W. Hanson, Atelier Hirons, N. Y. C.; H. F. Baldwin, L. R. Vernon, and M. S. Dimmock, Mass. Inst. of Tech.; R. Damberg, Univ. of Minnesota.

MENTION:—E. Weston, Boston Archtl. Club; M. D. Smith, T. R. Hinckley, H. C. Kreisle, W. T. Spann, J. B. Blair, T. G. Tiffany, F. M. Highberger, M. C. Bert, L. C. Page, H. A. Page, C. J. Billmeyer, G. A. Fister, Louise Barton, J. Delo, P. F. McLean, H. Douden, G. A. Brink, C. F. Bowers, A. Schoept, M. G. Uslan, A. Taormina, G. O. Schoonover, C. J. Pellegrini, R. Patterson, W. L. Gibb, Jr., E. Hughes, J. J. Keil, K. H. Snyder and P. C. Reed, Carnegie Inst. of Tech.; O. W. Wilson, W. E. Page, F. J. Woodbridge, P. Simonsen, J. M. Paul, A. M. Taylor, S. R. Moore and H. C. Porter, Columbia Univ.; R. C. Danis, P. F. Dowling and W. R. Furey, Catholic Univ., Wash., D. C.; H. A. Surman, Dallas Archtl. Club; E. W. Cappelmann and A. E. Constantine, Georgia Sch. of Tech., Atlanta; T. J. Rowland and W. Harris, George Washington Univ., Washington D. C.; K. Sasagawa, Atelier Hirons, N. Y. C.; E. L. Babitsky, E. C. Rising, G. S. Johnston and L. A. Balicki, John Huntington, Poly. Inst., Cleveland; P. Duell and P. E. Murphy, Los Angeles Archtl. Club; Miss F. Day, H. W. D. Archibald, R. L. Albert, B. A. Weber, A. H. Pierce, H. R. Wiggs, L. M. Cheves, Miss E. Hemmenway, E. G. Pennell, G. D. Swan, Miss M. Pierce, W. R. Amon, Miss E. P. Stickney, D. J. Luykx, I. Georgevitch, A. J. Frappier, S. M. Ryerson, Miss M. Mall, A. H. Vignoles, A. L. Jones, C. C. Carven, G. S. Holderness, C. H. Mahlenberg, Jr., and R. Hayward, Mass. Inst. of Tech.; D. R. Lundberg, R. E. Dando, G. M. Nedved and T. Ross, Jr., Atelier Parsons-Chicago Archtl. Club; F. A. Comstock and H. D. Baker, Princeton Univ.; W. P. Crabtree, Jr., and B. C. DeMello, Syracuse Univ.; W. R. Fisher, E. S. Young, E. A. Beihl, C. A. Langzettel, H. T. Plumer and J. H. Geissel, "T" Square Club, Phila.; R. N. Hazlewood, Alice V. Little, A. D. Wills, A. R. Melander, E. Larson, H. H. Haines, M. L. Anderson, O. Thorshov, G. A. Stewart, H. Gerlach and H. A. Kreinkamp, Univ. of Minnesota, M. W. Gill and D. A. Seibert, Univ. of Washington, R. A. Herthel and R. R. Hibbs, Univ. of Kansas; C. B. Lewis, D. M. Campbell, A. G. Clay, H. S. Kelly, M. Pardo, W. Douglas, P. E. Isbell, B. S. Georges and V. M. Reynal, Yale Univ.

H. C.:—F. B. Smith, W. M. Burke, V. H. Stromquist, H. H. Lefkowitz, R. A. McKee and F. H. Floyd, Carnegie Inst. of Tech.; L. R. Levy, Georgia Sch. of Tech., Atlanta; S. M. Palm, Atelier Hirons, N. Y. C.; F. K. Cheetham, Atelier Parsons-Chicago Archtl. Club; H. A. Allen, "T" Square Club, Phila.

SUPPLEMENTARY JUDGMENT

MAY 24TH, 1922

CLASS "A"—V ESQUISSE-ESQUISSE—"A CEILING DECORATION."

NUMBER OF DRAWINGS SUBMITTED:—4.

AWARDS:—

MENTION:—M. L. Colean, Columbia Univ.

CLASS "B"—V ESQUISSE-ESQUISSE—"AN ARTIST'S STUDIO."

NUMBER OF DRAWINGS SUBMITTED:—4.

AWARDS:—

FIRST MENTION:—W. Conley, Columbia Univ.

CLASS "A" & "B" ARCHAEOLOGY—V PROJET—"A SMALL VILLA IN THE STYLE OF PALLADIO."

NUMBER OF DRAWINGS SUBMITTED:—3.

AWARDS:—

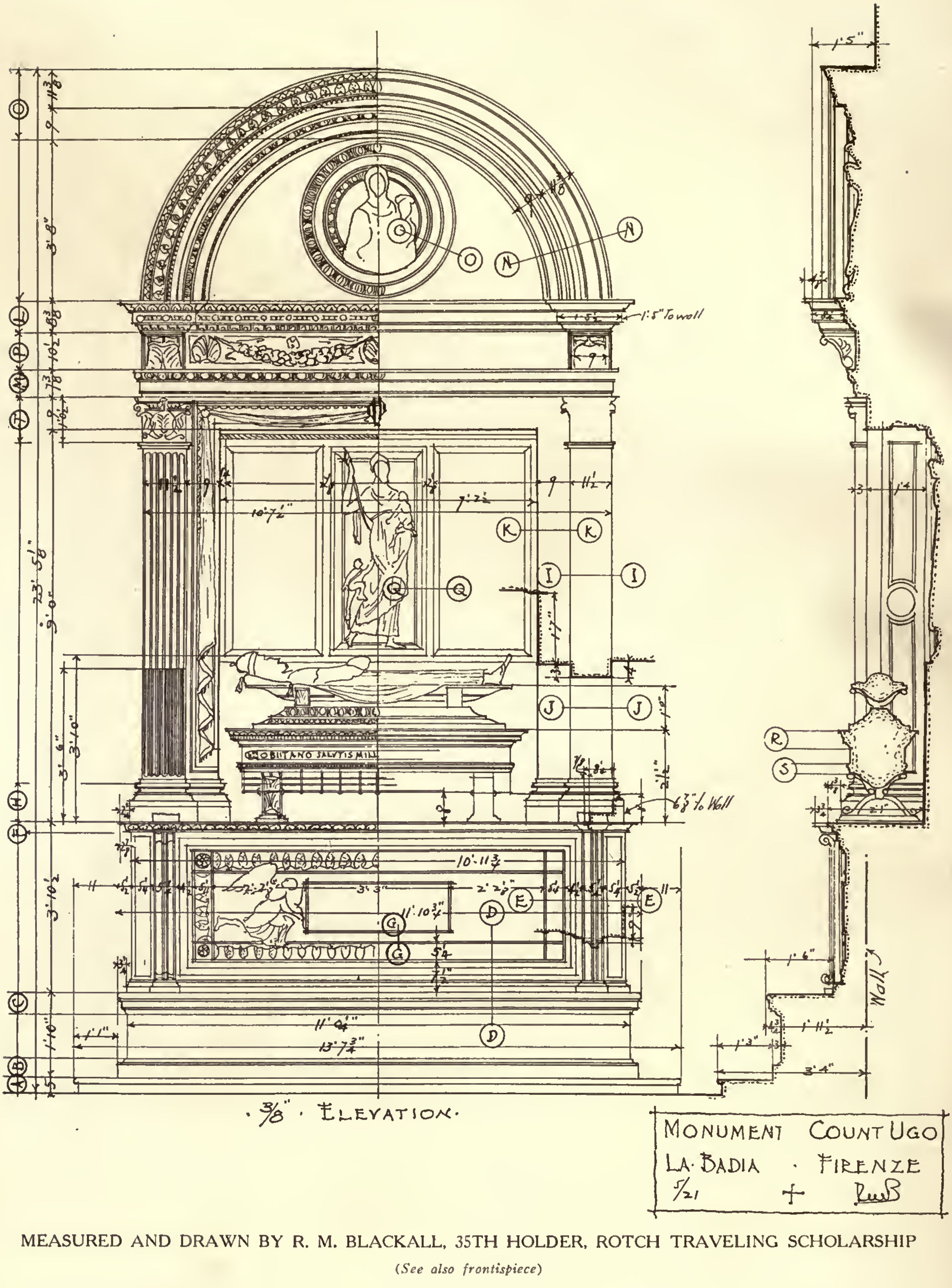
THIRD MEDAL:—R. T. Morenus, Columbia Univ.

MENTION:—C. F. Fuller and I. Tron, Columbia Univ.

H. S. Torbett — Carnegie Institute of Technology

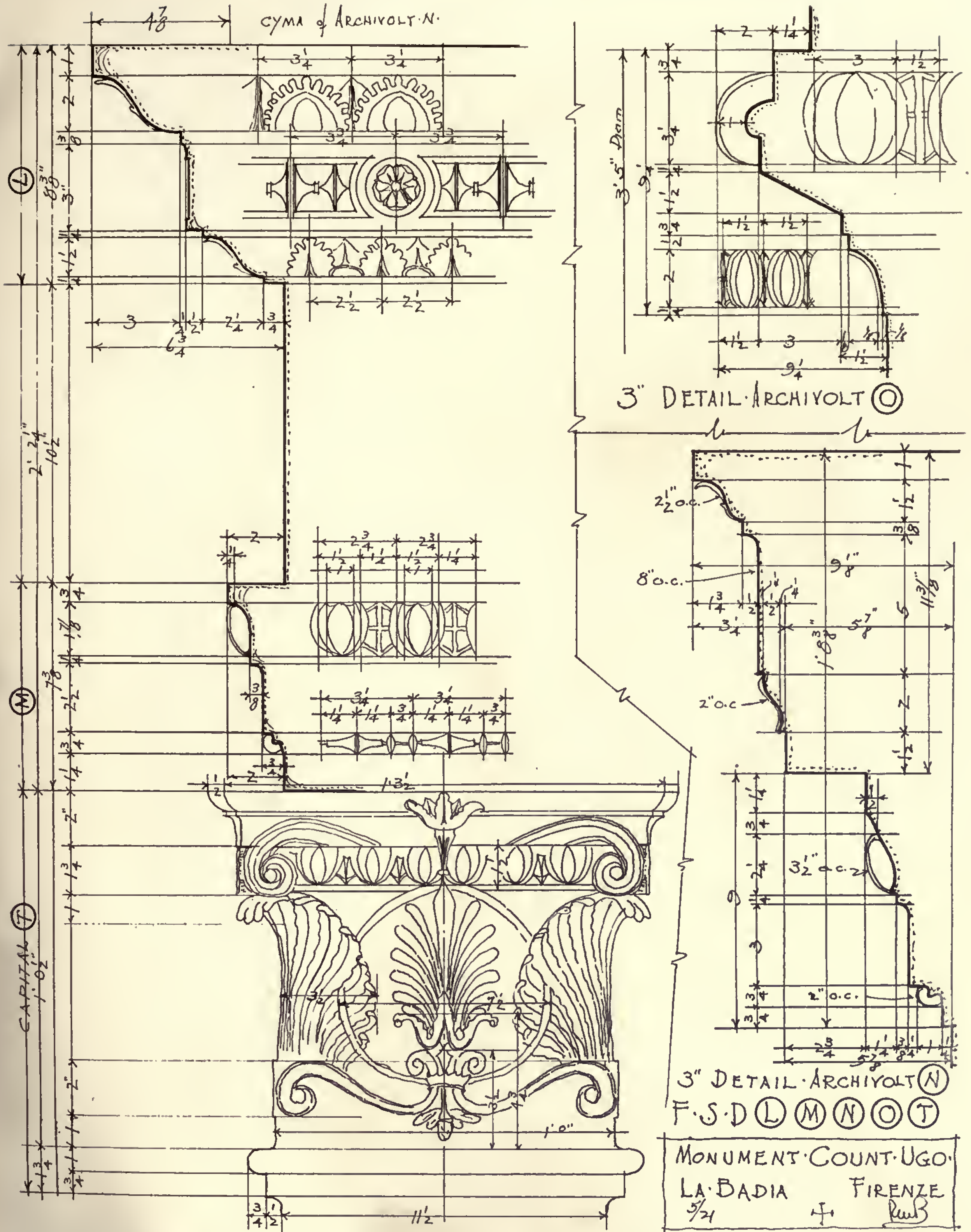
1st MENTION PLACED

Class "B"—V. Analytique—A two-storied Portico




MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

*(See also frontispiece)*




MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELING SCHOLARSHIP

*(See also frontispiece)*

*THE AMERICAN ARCHITECT, SERIES II.*
*FRENCH AND ITALIAN DETAILS*

SKETCH FROM THE OFFICE OF
CHARLES A. PLATT, ARCHITECT

# ·EDITORIAL·COMMENT·

THE MICHIGAN STATE SOCIETY IS the latest of these efficient state organizations to demonstrate usefulness and the energetic and progressive manner in which well organized State societies will function.

The Michigan Society has organized and is conducting in a high school at Detroit, a class of men ranging in age from 18 to 55 years, composed of contractors, superintendents, foremen and employees of fifteen building trades. Sessions are held two evenings each week.

The attendance at these classes taxes the capacity of two grade rooms, and many applicants have been refused because of lack of class room.

The course of study has been planned to show the correlation of the different trades, and to impart such knowledge as will facilitate the course of construction and add to the completeness of the finished building.

A similar movement has been successful in Philadelphia, and the instant acceptance of the idea in Detroit shows conclusively the practicability of such efforts and the good results that accrue.

If for no other reason than to accomplish such desirable ends as are being secured in Michigan, it would be logical to advocate the formation and active working of societies in every state. As has been pointed out many times in these pages, the advocacy of State societies is in no sense treason to the Institute. There are well organized Chapters of the Institute in Michigan, New York and Illinois, just as there are equally well organized State societies. The national aspects of practice as referring in part to local issues can be and are the proper fields for the Institute. But purely local, or state problems can be and are better handled by State societies which directly approach their problems, than by the dilatory or slower processes of the Institute.

Why not, in view of the evidence, have more State societies?

* * *

SPECIFICATION AND SPECIFIC HAVE the same root form. No one appears to be in doubt as to the meaning of specific, yet how many specification writers fail to link the two words. They write specifications which in many places fall far short of being specific. Definite is a useful synonym for specific and the expression "definite specification" avoids the alliteration resulting from the use of the expression "specific specification," occasionally encountered in lawyers' briefs. To be definite should be the outstanding quality of specifications. Specifications call for things to be done in a definite manner or to perform a definite service. The coupling of the word definite with the word specification is a departure from strong English, for specification means definiteness of statement.

To be specific or definite implies the existence of a standard. When a specification writer calls for a certain material, process or piece of equipment followed by "or equal" the element of uncertainty as to what may be a proper standard makes the specification vague. Not being specific, it ceases to be a specification and becomes a general description. Doubts can arise as to the ability or uprightness of the man on whom rests the responsibility of defining "or equal." They often arise and are frequently given vocal expression. The only thing to do is to remember that to be definite is to demand something specific. He who does this becomes in time respected by artizans and is sought for by clients. A definite statement is not always arbitrary but the weariness of mind brought on by insistent demands for a definition of "or equal" frequently results in arbitrary decisions.

A wise man once said "Only incompetent men curse their task." A little reflection on this remark may lead to more care in the preparation of specifications, for a competent specification writer will obtain for his client a maximum of values with a minimum expenditure of energy. His employment will be justified by the results obtained and how he obtains them. Friction is expensive and leaves lasting effects. Specifications have for their indirect purpose the reduction of friction in personal relations to an irreducible minimum. They accomplish their purpose in proportion to definiteness of statement and firmness in execution of the clause they contain.

* * *

ENGLAND'S HOUSING PROBLEMS, AS acute as our own, do not appear to be any nearer to a practical solution. In this country we have evolved no national scheme, no plan by which we might propose to take steps that would result in building. This is perhaps fortunate for us. The building industry is able to take care of its own business and needs no political interference. But, it is just such interference that has resulted in England's housing perplexities. The intricately devised schemes, all economically unsound, have now been cast aside. Meantime little, if any, progress has been made in England. It is probable that the working out of these matters may be left to those who should logically undertake it, and that once the housing problems are freed of their political features, the situation will steadily and safely improve.

The dearly bought experience of the English building industry may very well serve as an example of how not to do it, to our own industry.

The only safe way is to build houses as a paying investment and this can only be done by private enterprise. National control of civil industry is a restraint that it is not believed the people of this country would patiently endure.

Political parties may show their usefulness by favoring the elimination of these conditions of labor and capital that are the real retardants. When these are removed or their influence lessened, the splendid organization of the building industry will at once function in the most efficient manner.

* * *

ACKNOWLEDGEMENT IS MADE OF A lengthy communication from the League of New York Artists, protesting against the disrespect shown by city contractors of subway operations to monuments located along the line of subway work. This letter directs attention to numerous instances where monuments have suffered from carelessness or neglect to give proper protection.

Specific attention is directed to the equestrian statue of Washington, located facing Fourteenth Street on the South side of Union Square. Probably no finer statue of Washington has been anywhere erected in this country. Citizens for generations have prized it as one of the City's finest art treasures. For many months it has been surrounded by piles of construction debris, and treated with most utter indifference. The rubbish is now being cleared and it is disclosed that the fine granite pedestal is smeared with pitch, and otherwise disfigured and stained. Further it is claimed that the blasting carried on for so long a period has disturbed the security of the statue's foundation and that there may result serious injury from settlement.

One thing is certain, that our public statues should be saved so serious a menace. The Municipal Art Society might with propriety start an investigation to fix the responsibility for any damage to this and other works of art along the line of subway construction work.

* * *

ERNEST WILBY, LONG TIME ASSOCIated in practice with Albert Kahn, at Detroit, Michigan, will teach an advanced class in design-problems at the Architectural College of the University of Michigan during the second semester of the present year, which began on February 13.

The policy inaugurated at Ann Arbor to use all the academic instruction in design, construction and drawings as preparatory to a senior and graduate course in architecture is decidedly a step in the right direction.

It is proposed to design a building in a thoroughgoing manner, giving to its problems much more consideration of the professional view than is now possible in the usual undergraduate work. While an architectural school cannot be made a substitute for an architect's office, it is the intention at Ann Arbor to provide instruction in the co-ordination of the various parts of the work and in those aspects of design which a graduate usually obtains at the hands of a first class head draftsman or the employing architect himself, if, fortunately, he at once takes employment in a high class office.

Mr. Wilby's course of instruction will undoubtedly achieve the most practical and efficient results, and the University of Michigan may be congratulated in the inauguration of a departure which will undoubtedly lead to other and equally radical and commendable changes in architectural educational courses.

# NOTES ON THE ILLUSTRATIONS

## TWO HOUSES AT NORTH PLAINFIELD, N. J.

JOHN T. SIMPSON, Architect; BROWN ROLSTON, Associate

THE designing of two houses to be built side by side is always an interesting problem, particularly when the circumstances permit them to be designed at the same time and more or less as a unit. Such was the problem presented by the two houses shown elsewhere in this issue. They were designed, placed and erected with a view to harmonizing with each other and with their surroundings. The general type selected was the so-called "Colonial,"—one house in the Dutch phase, the other in the New England phase. They were placed approximately 150 feet from the road, which at this point turns on a sharp curve, so that while they are a uniform distance from the street the houses are staggered and therefore do not give the monotonous, military effect so frequently seen in surburban towns. The setting is peculiarly fortunate. The properties are deep, running back perhaps 350 feet from the road to a steep wooded bank at the base of which a stream runs through a forest of primeval trees, giving a quick transition from the formality of the well kept lawns and gardens to the wild freedom of the woods. A few large trees are well placed near the houses, lending that settled appearance so much to be desired for houses of this type. Across the front of both places a low stone wall is built through which the walks and driveways pass between white picket gates.

The main problems in the design of the McGee house were, first, to keep the house in character and at the same time avoid sloping ceilings in the second floor; and, second, the creation of a sun porch and sleeping porch, usually so fatal to any Colonial house. The first difficulty was overcome by carrying the hood across the front of the house below the second story windows and putting a gambrelled roof on the extension; thus without clipping the corners of any of the rooms a general gambrelled effect is achieved. It was, of course, not possible nor indeed desirable to disguise the purpose of the sun porch entirely but a compromise was reached which neither misrepresents the real object of the interior nor violates the general tradition of the exterior treatment. The sun porch and sleeping porch were placed in an extension that conforms in general design to the kitchen extensions of an earlier day. The windows of the sun porch match in size and shape the other windows of the first floor and are so spaced that each group is flanked by shutters which gives the solidity necessary to kill that all-glass effect so much to be avoided in Colonial design. The sleeping porch offered the greatest problem of all but was satisfactorily solved by putting a low dormer in the front with two small casement windows high up, a group of three windows at the side flanked by shutters and at the rear two double casement windows dormered at an equal height to the front dormer, giving a symmetrical profile but cut down almost to the floor. The interior is left open to the peak giving an unusual and pleasing effect of broken ceiling lines. A semi-circular ventilating louvre at the peak adds charm to the exterior and serves a practical purpose at the same time. Bed space is allowed under the high windows at the front so that while no draught blows directly on the beds, complete ventilation is achieved. The walls are sand plastered in grey and the floor drops down one step below the bedroom floor, adding to the quaintness of the interior.

In plan the house follows convention to a large degree but one or two diversions are worthy of note. From the paved terrace on the garden side of the house a door leads to a rear hall which serves as a gradual transition between the main part of the house and the service portion. The objects of this hall are to cut off the first floor lavatory and the entrance to the cellar stairs from the main part of the house and still give access to them without going through the service portion, and also to allow the owners to reach their rooms on the second floor without going through either the main portion of the house or the service portion. A large closet where all the outdoor things may be kept, opens off this hall. There is a small closet in the pantry for table leaves and other dining room extras, and a mop closet in the kitchen separate from the larder. The arrangement of rear entry and larder in a small one story extension keeps the refrigerator and stores out of the heat of the kitchen.

The third floor contains one large bedroom and an ample attic.

THE problems of the Howell house were somewhat similar to those of the McGee house except that a study was required on the first floor and two large master chambers and a boudoir on the second. The first was attained by shortening the entrance hall and placing the study in the space thus saved. The square hall is distinguished by a graceful curving stair leading to a large open second story hall. The additional space on the second floor was gained by carrying the floor out over the brick-paved piazza at the rear, a practice usually to be avoided but, as the illustrations show, that top-heavy look so frequent when this expedient is used, has been avoided by the use of large solid piers faced with pilasters. The sun porch was treated on the same principles as that of the McGee house. As no sleeping porch was required this space was utilized for the owner's bath and two large clothes closets. The third floor contains two finished rooms and a large attic.

Both houses are equipped with batteries of warm air generators, and in addition the fireplace in the study of the Howell house has a heater installed which furnishes hot water heat to the owner's bathroom and to Master's chamber No. 1 when a log fire is lighted. This is used in early fall and late spring when the regular heaters are not running.

The exteriors are of long cypress shingles on the sides, with edge grain cypress trim, and Creodipt cypress shingles on the roofs.

### Monument to Count Ugo, Marquis of Tuscany, in the Church of the Badia at Florence, Italy

Mino da Fiesole, who lived from 1431 to 1484, excelled in the design of such works as altars, monuments and tombs all of which were purely decorative works. One of his best works is this tomb to Count Ugo. Made of marble and now in excellent preservation, it stands as one of the exquisite bits of purely architectural decoration. It was built in 1481 near the end of Mino da Fiesole's life and is one of his masterpieces.

### War Memorial for the City of Barre, Vermont

This monumental memorial, the tribute of the citizens of Barre to the soldiers and sailors of Barre, engaged in the World War, is the prize winning design of John Mead Howells, architect.

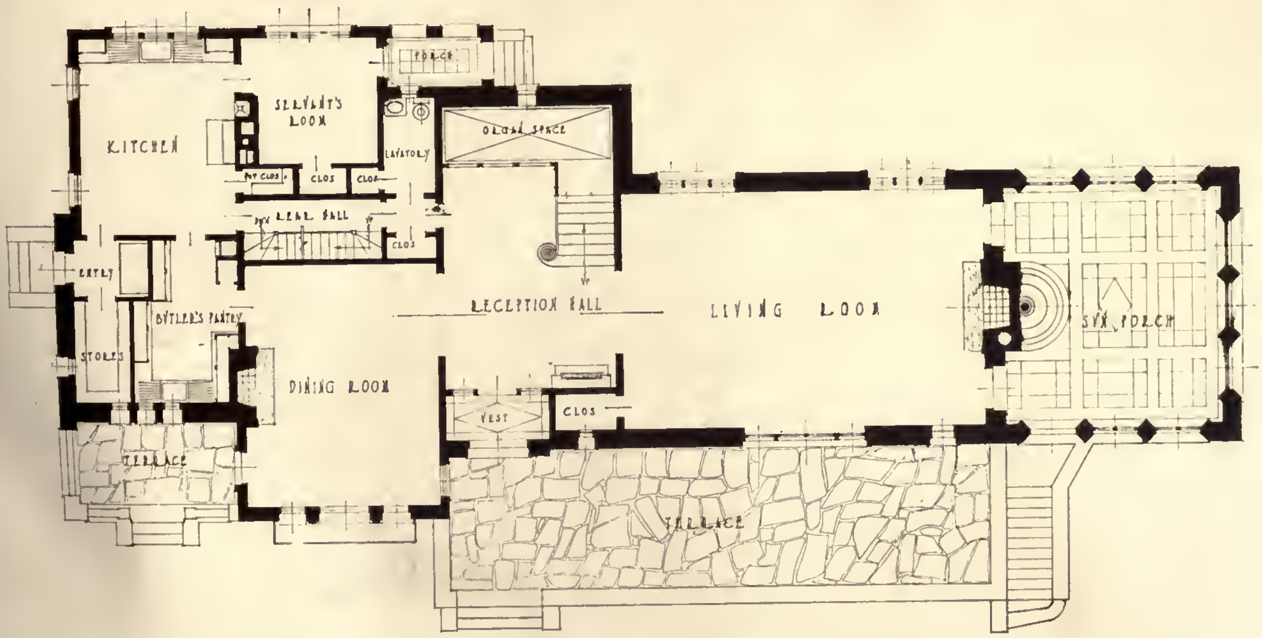
In its completed form the figure will be nine feet high, and will rest on a die which will lift it six feet more. This die, in turn, will rest on a base a foot high. The whole design forms a granite circle fifty feet in diameter, and has been located by the architect at the point of the City Park, in the center of Barre, where the Roosevelt National Highway divides.

Architect's Sketch for War Memorial, Barre, Vermont
John Mead Howells, Architect

HOUSE OF EUGENE A. RIOTTE, ESQ., MANHASSET, L. I., N. Y.

SLEE & BRYSON, ARCHITECTS

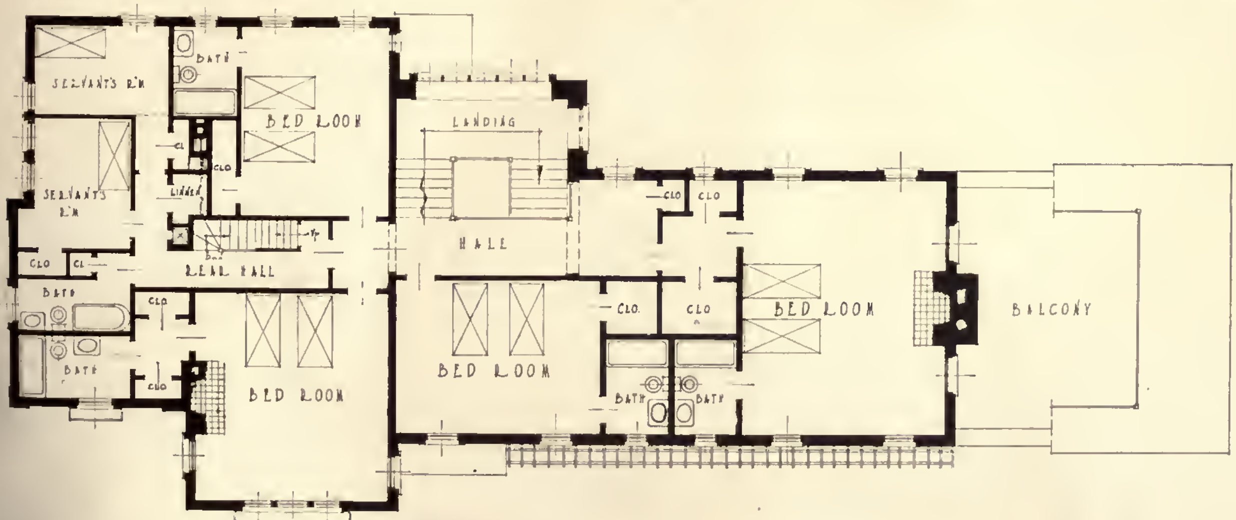
178'




HOUSE OF EUGENE A. RIOTTE, ESQ., MANHASSET, L. I., N. Y.

SLEE & BRYSON, ARCHITECTS

$178^{2}$




HOUSE OF EUGENE A. RIOTTE, ESQ., MANHASSET, L. I., N. Y.

SLEE & BRYSON, ARCHITECTS

$178^3$

DINING ROOM

LIVING ROOM

HOUSE OF EUGENE A. RIOTTE, ESQ., MANHASSET, L. I., N. Y.

SLEE & BRYSON, ARCHITECTS

1784

A HOUSE AT RYE, NEW YORK

S. EDSON GAGE, ARCHITECT

1785

DETAIL OF PRINCIPAL ENTRANCE

A HOUSE AT RYE, NEW YORK

S. EDSON GAGE, ARCHITECT

178⁶

A HOUSE AT RYE, NEW YORK

S. EDSON GAGE, ARCHITECT

178[7]

DETAIL OF PRINCIPAL ENTRANCE

178 8

HOUSE OF FRANK ROLLINS, ESQ., FIELDSTON, N. Y.
DWIGHT JAMES BAUM, ARCHITECT

178^9

HOUSE OF FRANK ROLLINS, ESQ., FIELDSTON, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

178¹⁰

HOUSE OF PAUL BAYNE, ESQ., RYE, N. Y.

S. EDSON GAGE, ARCHITECT

178"

DETAIL OF MAIN ENTRANCE

HOUSE OF PAUL BAYNE, ESQ., RYE, N. Y.

S. EDSON GAGE, ARCHITECT

178 18


AN APARTMENT HOUSE ON PARK AVENUE, NEW YORK

WM. LAWRENCE BOTTOMLEY, ARCHITECT

178 13

DETAILS OF MAIN ENTRANCE
AN APARTMENT HOUSE ON PARK AVENUE, NEW YORK
WM. LAWRENCE BOTTOMLEY, ARCHITECT

178[14]

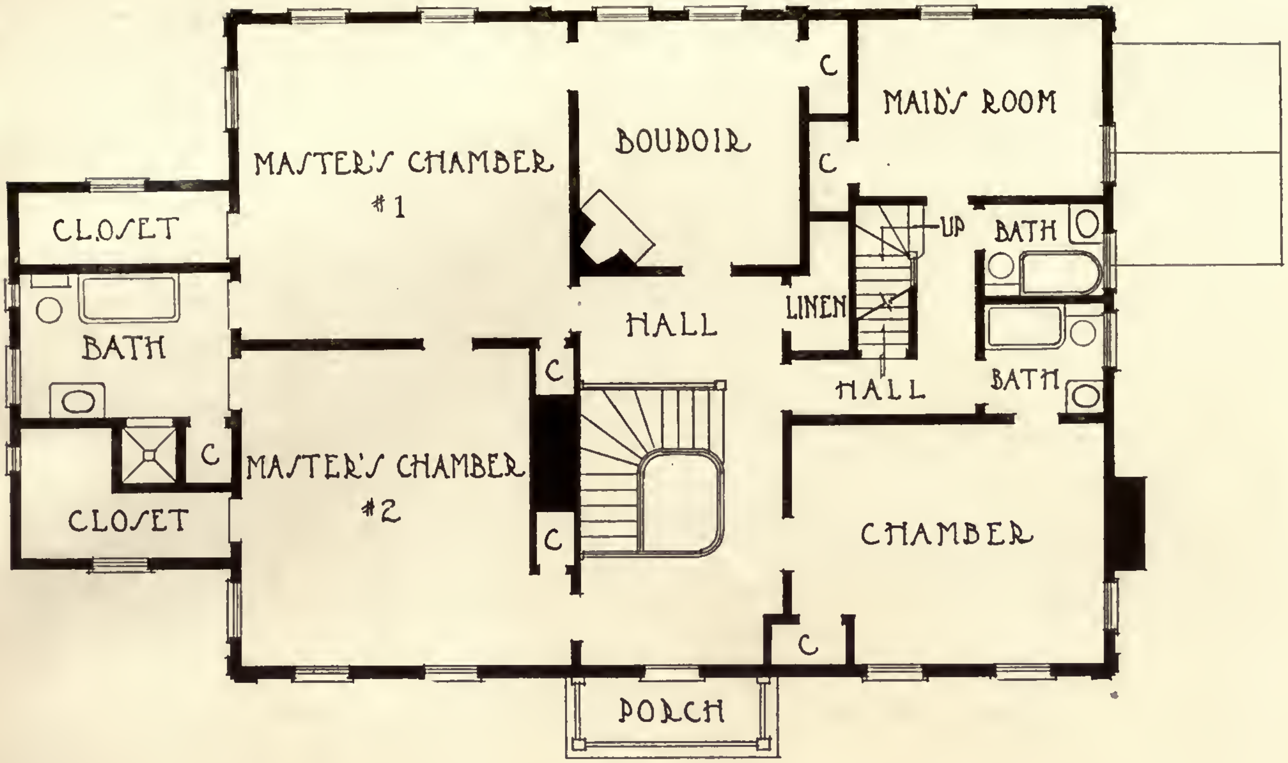
HOUSE OF H. L. McGEE, ESQ., NORTH PLAINFIELD, N. J.

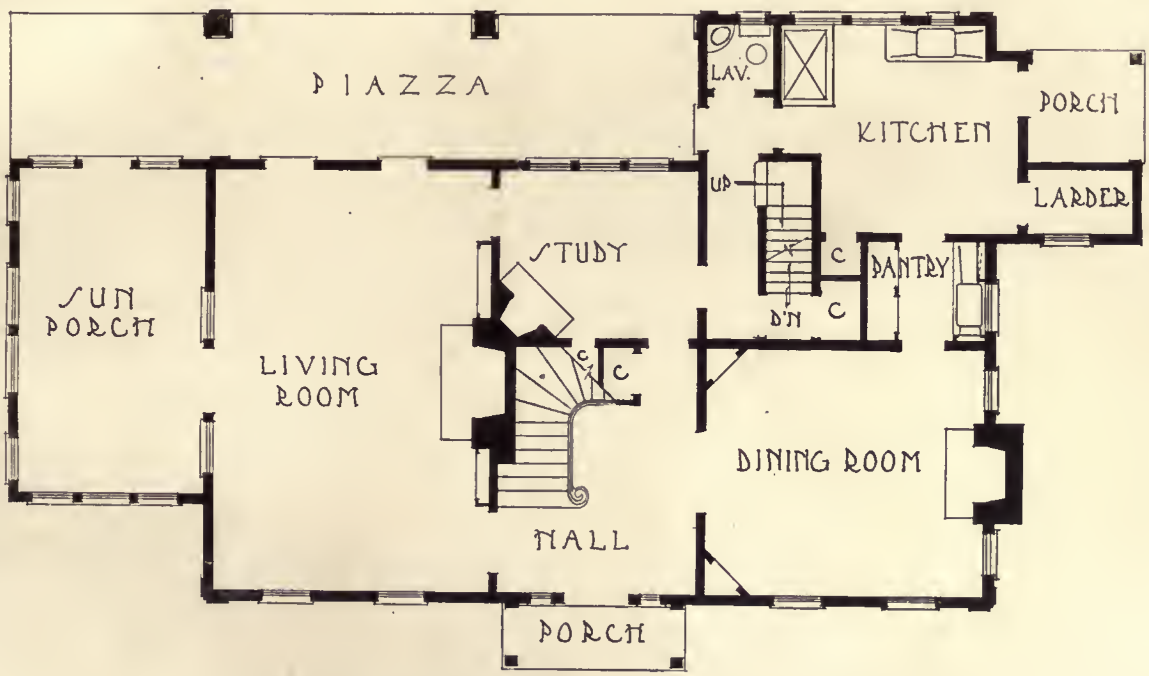
JOHN T. SIMPSON, ARCHITECT; BROWN ROLSTON, ASSOCIATE

(For description see page 177, for plans page 180)

178 15

HOUSE OF J. H. HOWELL, ESQ., NORTH PLAINFIELD, N. J.
JOHN T. SIMPSON, ARCHITECT; BROWN ROLSTON, ASSOCIATE
(For description see page 177, for plans, page 179)

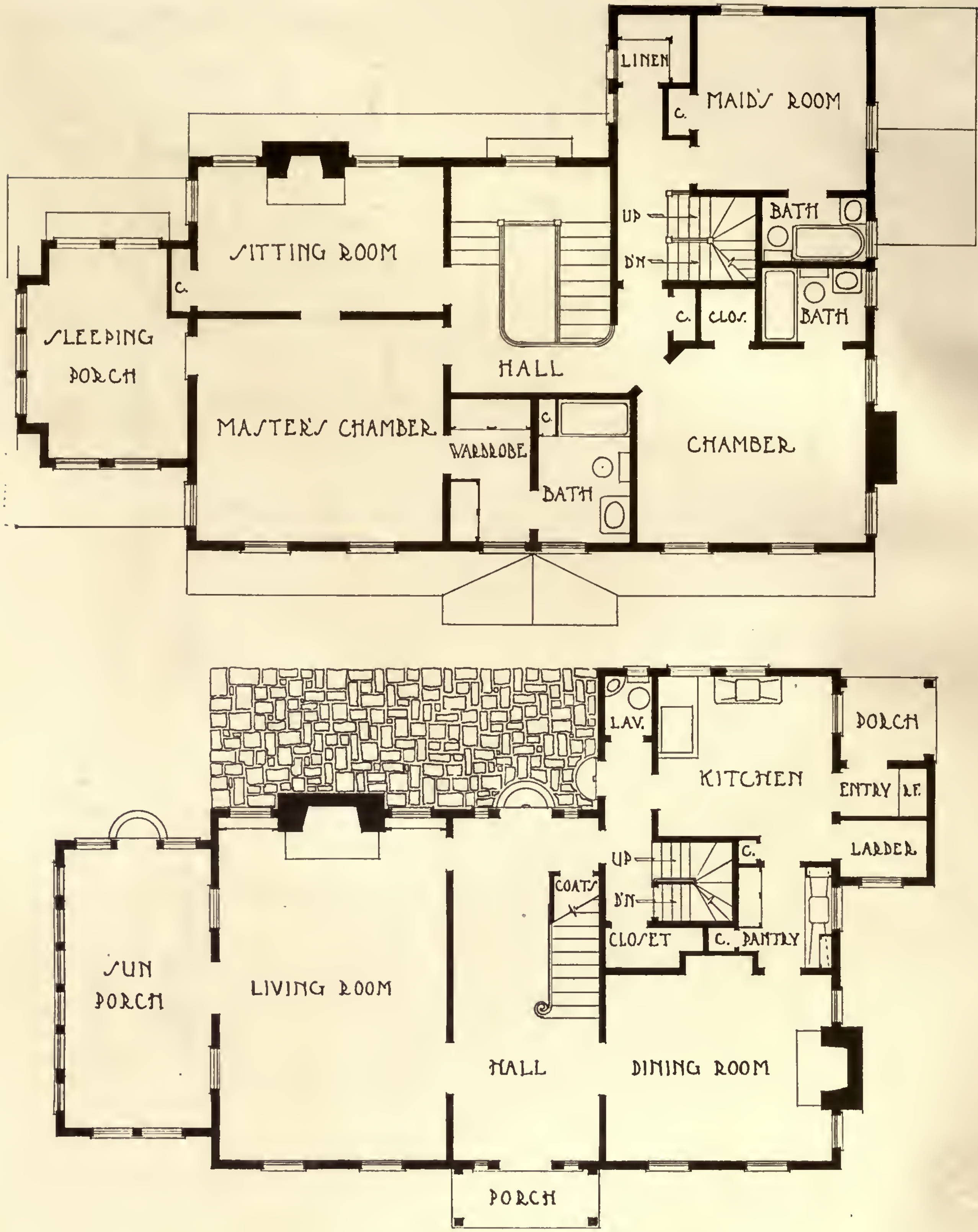



HOUSE OF J. H. HOWELL, ESQ., NORTH PLAINFIELD, N. J.

JOHN T. SIMPSON, ARCHITECT; BROWN ROLSTON, ASSOCIATE

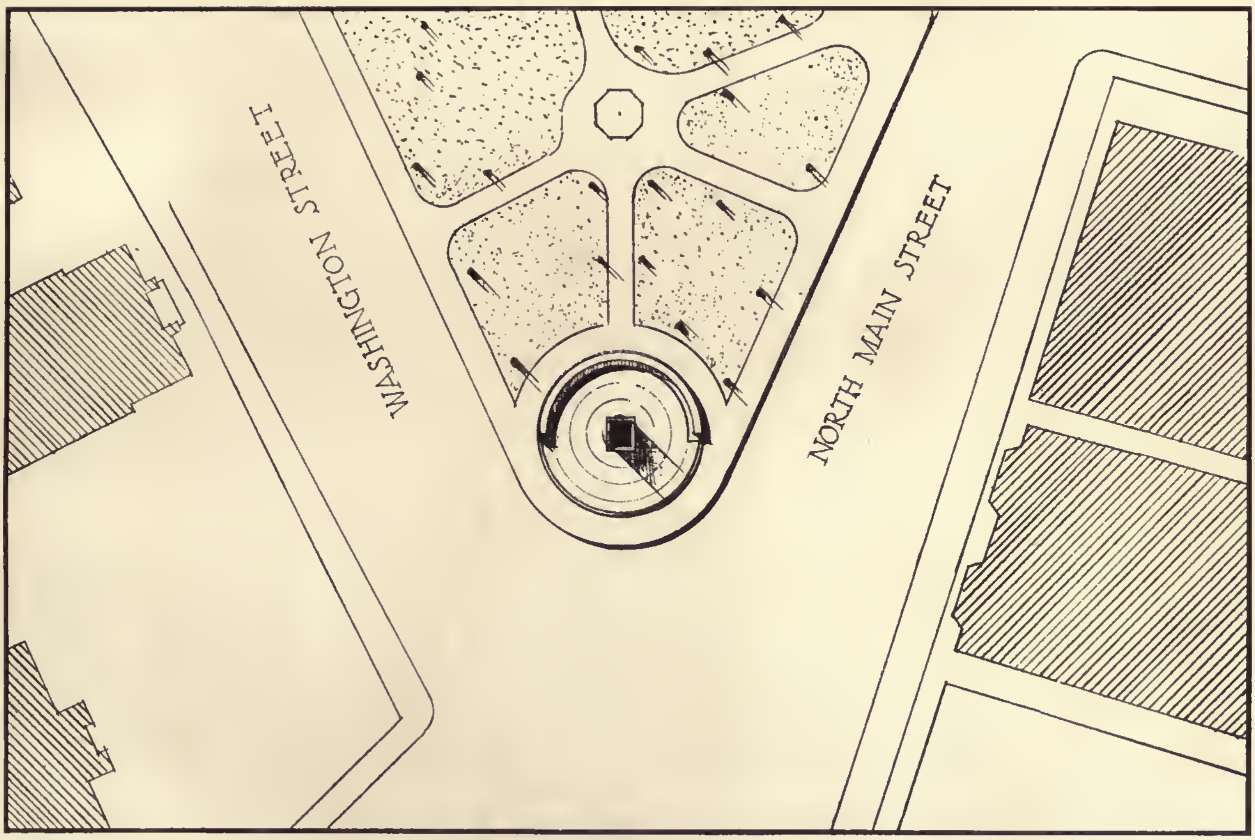
*(For exterior view see plate section, for description page 177)*




HOUSE OF H. L. McGEE, ESQ., NORTH PLAINFIELD, N. J.

JOHN T. SIMPSON, ARCHITECT; BROWN ROLSTON, ASSOCIATE

*(For exterior view see plate section, for description page 177)*




SOLDIERS AND SAILORS MEMORIAL, BARRE, VERMONT

JOHN MEAD HOWELLS, ARCHITECT

(*See page 178 for description*)

MAUSOLEUM FOR J. HARPER POOR ESTATE, WOODLAWN, NEW YORK

JOHN MEAD HOWELLS, ARCHITECT

FOUNDER'S MEMORIAL, BELOIT, WIS.

JOHN MEAD HOWELLS, ARCHITECT

MAUSOLEUM ON A LONG ISLAND ESTATE

JOHN MEAD HOWELLS, ARCHITECT

SKETCH FOR PROPOSED YORKVILLE WAR MEMORIAL,
CARL SCHURTZ PARK, NEW YORK CITY
JOHN MEAD HOWELLS, ARCHITECT

# LEGAL DEPARTMENT

Conducted by

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

### Discharge of the Architect—His Right to Compensation and Damages

THERE seems to be a feeling on the part of many people that a client can discharge an architect at any time, at his pleasure, and that, if he does this, his only obligation, under such circumstances, will be to pay the architect the proportionate amount of his compensation which has accrued up to that time.

In the absence of an agreement providing otherwise the law does not provide any such rule of damages:—

The employment of the architect is, it is true, a contract of personal employment. That is, the employment is based on the personality of the architect, and in this respect differs from a purely business agreement involving no personal equation, such for instance as an agreement to convey real property. If a man agrees to convey property to you and refuses to do so you can secure from a court of equity an order compelling him to perform his contract. If however, a man employs you as an architect or as a lawyer, or doctor, to do a certain piece of work, the court will not compel him to continue to employ you or enjoin him from discharging you if he wishes to do so. This is because the contract is a personal one and depends upon his confidence in you as an individual and in the value of your services as such.

While all this is true, it by no means follows that if the architect is discharged without just cause, his only right is to receive the proportionate amount due him at the time the discharge is effective. His employer can discharge him but he cannot, in the absence of an agreement to the effect, limit his right to compensation to any such extent. He discharges him at his peril and can be held liable for the damages sustained by the architect as the natural result of his act.

If an architect be employed to prepare plans and specifications for, and to superintend the erection of, a given building under an agreement that he shall receive as compensation a specified commission based on the total cost of the job, the owner cannot avoid his obligation to pay the architect his full fee on the total cost of the building as erected, by discharging him before the work is finished and continuing it to completion without him.

In the case of an ordinary employee, the employer, where the employee is discharged and sues for services on the basis of the full term of the contract of employment, is entitled to set off against the account, which would have become due under the contract any sums received by the employee from any other employment, which he has had during the period commencing at the date of discharge and ending at the time the original contract of employment terminated. If, for instance, a bookkeeper were hired for one year beginning January 1st, and was discharged improperly July 1st, and brought suit for the six months' salary from July 1st to December 31st, but in the meantime accepted a new employment, the employer could deduct from the sum claimed by the bookkeeper the amount received by him during the period from July 1st, to December 31st.

Theoretically, this same rule would apply in the case of the employment of an architect. As a practical matter, however, it has no real application in the ordinary case for the reason that the architect, handling many different matters, is in an entirely different class from an employee such as a bookkeeper, who works for one employer at a time. The fact that the architect is employed to build a house for Mr. Smith after he has been discharged by Mr. Jones does not entitle Mr. Jones to set off the amount received by the architect from Smith, for the simple reason that the architect would have been able with his organization to handle the Smith job in any event, whether he had been discharged or not.

Somewhat analogous to this question of compensation, in the event of discharge, is a misunderstanding with respect to the Institute schedules, with which one sometimes has to contend. Noting the provision that payments may be made in instalments, a client will assume that the provision that 1/5 of the fee is payable when the preliminary sketches are submitted means that if the employment of the architect is stopped at that point the 1/5 payment is intended to be a full measure of the sum payable to the architect for the work done up to that point. As a matter of fact, of course, this is not necessarily true. The instalment payment under the schedule is not meant to be a payment in full for all the work done up to that time, but merely a payment on account of the total fee. The times and proportions at which the instalments are to be paid are merely adopted for convenience, on the theory that they represent as nearly as practicable the amounts which become due at the various stages of the work. It does not follow that these instalment payments represent accurately in any given case, the actual value of the work done up to the respective points at which the instalments become payable. The contract is an entire contract covering the building operation as a whole. Instalment payments are provided for, but this does not mean that the owner, having employed the architect to do the particular piece of work in hand can refuse to let him proceed when the first 1/5 instalment has become payable and by then paying him the exact amount of that instalment necessarily square the account at that point.

Of course, with respect to these payments, as with respect to the discharge of the architect, a special agreement, if it exists, direct or implied, may change the situation, and where such an agreement is definitely shown to exist, its terms will govern and bind those who are parties to it. The provision in the Institute schedule of charges that where the work is abandoned or suspended, the fee for preliminary studies shall be in accordance with the character and magnitude of the work, is indicative of the fact that the payment usually made upon the completion of these studies is not taken to be the exact gauge of the value of the work done.

To be on the safe side, the architect must always remember that each case is decided on the particular facts involved in it, and the question whether or not, in a given case, he can hold an owner liable for full compensation, in case of his discharge, and what, in general, his rights are under such conditions, will depend on the particular facts in the case and any agreements existing between the parties and the dealings which they have had together.

## LEGAL DECISIONS

WHERE an architect is employed to prepare plans and specifications and to superintend the erection of a building and is prevented from performing his services by the employer and through no breach of the contract on his part he may recover from the employer as damages the full amount of his contract fee as though he had continued in charge of the building operation.

*Graf. v. Lacv*, 120 *Wisc.* 177.

WHERE the owner discharges the architect before the completion of the building, the architect is entitled to recover as damages the amount which would have been paid to him for architectural services under his agreement with the owner if the work had been completed.

*Kilroe v. Rutherford*, 56 *N. J. Law* 23.

THE damages which an architect discharged by an owner while the work is in progress may recover are the agreed value of his services based on the contract price.

*Kitchel v. Crossley* 101 *Atlantic* 179.

THE schedule of charges of the American Institute of Architects will be received as evidence of the reasonable rate of compensation for an architect's services in the absence of a special agreement covering them.

*Gilman v. Stevens*, 54 *Howard's Practice* 197.

THE schedule of charges of a local chapter of the Institute will not, however, necessarily be proper evidence of the value of an architect's services in another state.

*Mason v. U. S.*, 4 *Court of Claims* 495.

WHERE an architect makes a contract to furnish plans and superintend the construction for an agreed price and later the contract is superseded by a second agreement for plans for a structure of greater cost, no price for the architect's services being fixed, the architect may sue to recover the reasonable value of his services under the second agreement, and may prove the reasonable value of the plans and also of any additional services rendered by him.

*Marcotte v. Beaupre*, 15 *Minn.* 152.

WHERE, at the request of the owner, the plans are changed, the architect may recover for the work incident to making the changes, whether this is done after the bids were received or after the contract was let.

*Johnson v. O'Neill*, 181 *Michigan* 326.

WHERE an architect agreed to make plans and specifications and to superintend the construction of a building at an agreed price and the owner, after accepting the plans and specifications, abandoned the original plans and ordered new plans to be prepared for a different structure, and the architect prepared these, he may recover for them as extras.

*Fitzgerald v. Wolsh*, 107 *Wis.* 92.

NOTICE of an intention to charge extra compensation for extra drawings need not be given.

*Smith v. Bruyere*, 152 *Southwestern* 813.

WHERE a contract between architect and owner is under seal and does not provide for extra work on the architect's part and the owner causes extra work to be done, the architect may recover for it at the contract rate.

*Harrison v. McLaughlin*, 108 *Maryland* 427.

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## ELECTRICITY IN THE HOUSE

The first of a series of articles fully descriptive of the latest phases of electrical service in the house and the accessories that make for utility and convenience

## 1—THE GENERAL PROBLEM

BY ARTHUR WILLIAMS

EXCEPT for the type of mind which is quite content to do the standardized thing in the standardized way, adequate electric wiring for a modern home is a subject worthy of very considerable study. Furthermore, it is a study peculiarly appropriate to architects, since it unites in itself those diverse elements of the scientific, practical and the beautiful, which are the terms in which a genuine architectural problem must be stated. The architect thinks out in advance, and, through fairly rigid mechanical media, produces certain scientific desirables, certain practical conveniences and artistic effects, for the benefit of a client who probably has no realization of the detailed forethought involved, and only a hazy general notion that he wants the electric wiring "done right."

A "wired" dining room table, where the wiring is practically invisible, and where the table was not cut into at all in the wiring process

The architect's problem is not made the more simple by the fact that the general wiring procedure does not differ essentially now from what it was when electricity was used for lighting only, and then only at a few definite unchangeable points in connection with a rigid unmovable fixture. In other words, wiring is still inserted at a fairly early stage of building construction, pulled within partitions and otherwise treated after the manner of piping, as if its chief function were to convey illuminating gas to a central chandelier. Yet, in usage, modern people demand an enormous amount of electrical flexibility; not only does the present day expect illumination at any point that the fancy or decorative scheme may suggest, but also it requires that illumination be forthcoming with absolute convenience. Besides lighting, there is the entire new field of the domestic use of electricity, for cooking, for grinding, for cleaning, for washing, for ironing, for heating, and so forth and so on, almost ad infinitum.

In fact, the demands made upon electric wiring are so numerous and varied that one wonders if the day is not near, when some bold spirit will scrap the entire general procedure for household use, and develop a radically new and thoroughly domestic system of wiring, using as a source of supply, an armored electric cable concealed in the baseboard or picture moulding, to which in some fashion, ready access may be had at any desirable point, for any particular use.

That this is not a wild prophecy is indicated by the fact that one firm is already manufacturing a hollow, metal, baseboard through which electric cable can readily be pulled.* But until some such scheme can be elaborated and developed, so that ideas on electrical usage can be changed as easily as wall-paper, it remains necessary for the architect to do the advance-thinking on wiring, and in making his building-plans, to include the bones, as it were, of a good workable system of household electricity, so that on completion the

The tea-table today is wired, but the outlets are concealed by the leaves when the table is not in use

client will find all that he vaguely sensed as embodied in the term, "electricity in the home." If this is true for the builder of individual homes, it is also true for the designer of apartments, for the expansive use of electricity is in the air, and if lessees do not find conveniences available, they will provide them for themselves, in ways desired neither by the owners nor the insurance authorities.

The development of electrical usage within the home has followed three general divisions, improvements in convenience, in beauty, and in safety; still it is unsatisfactory to treat the subject along these lines, since a single improvement may involve all three elements. Thus, for instance, in substituting baseboard outlets for long loops of electric wiring strung about a room, one effects greater convenience, infinitely greater sightliness, and at the same time eliminates a certain degree of fire risk. Therefore, putting aside theoretical analysis for the moment, one finds that practically speaking, most of the recent improvements in electric housewiring are related to the problem of bringing the source of supply as near as possible to the point of use. Pursuing this aim plunges one immediately into the world of convenience, switches and outlets, and finally leads to that latest word in electrical ingenuity—wired furniture.

To have the entire electrical bag of tricks to command at the touch of the button, and to have that button placed readily to touch, sums up the entire doctrine of good electric house-wiring. And yet, when this statement has been made, the subject has not been concluded, but rather merely opened for discussion. No one can say where that button is to be placed readily to touch unless he knows for what it is to be used. Thus, in order to be really adequate, any treatment of electric house-wiring must study the house room by room, (as will be done in the series of articles to follow this one) pointing out the probable uses of electricity in that room, and the desirable wiring arrangements for such usage.

In the nature of the case, these articles will proceed along the lines of the most inclusive wiring plan, the wiring plan that would represent ideal conditions of availability of electric current, assuming that there was no question of financing such a wiring layout. Unfortunately, architects

These outlets are concealed by folding boards so that they would not be noticeable were the tea-table without leaves

are not always invited to provide electrical conveniences ad lib. for their clients; oftentimes their problem is to furnish the very best scheme of wiring possible within a set appropriation for the purpose. The unpleasant question therefore arises of deciding which electrical conveniences can be regarded as essential to comfortable living, and which are desirable, but hardly necessary. Again no off-hand answer can be given to this; it is a question of the scale of living. Certain devices, and provisions therefor, may be luxuries in houses maintained informally, and yet become genuine necessities in an establishment designed for elaborate living. Accordingly, the writer has suggested to the author of the series, for which this is the introduction, that in laying out wiring plans, a distinction be made between those provisions which might be considered suitable for the home of moderate price and those that are adapted

*The American Architect, *October* 26, 1921.

more especially for living on an elaborate scale. It is believed that such a division will make a study of this subject of far more practical value to the readers of this magazine.

A general discussion of present day problems in household electricity would not be complete without some reference to the development of wired furniture, the latest suggestion for arriving at a more intelligent employment of electricity in the home. Electric appliances of all kinds, whether labor-saving devices, such as laundry machines,

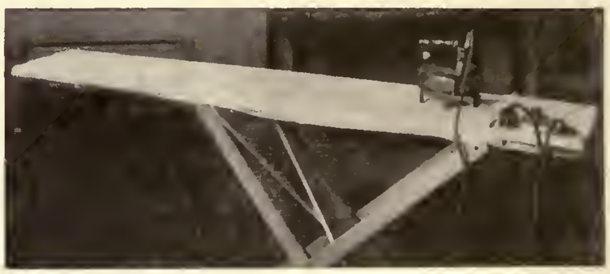
The ironing board has a socket to receive plug from nearby outlet; an outlet for the attachment of the iron and a switch between to insure safety

kitchen equipment, or cleaning implements of different sorts, are now sufficiently familiar to those in touch with the field of house-planning. Electrically wired furniture, however, is a new thing, and it remains to be seen whether it is a passing fad or a genuine development. It is the belief of the writer, that within reasonable limits, wired furniture is not a mere novelty, but another step in the general growth towards a safe, convenient and aesthetic system of house-wiring.

Wired furniture is rather a difficult matter to present graphically, since in the very fact that an article has been well and appropriately wired, its wiring becomes practically invisible, and hence unavailable for photographic representation. And the minute that furniture is wired so as to show conspicuously what has been done and how, it has ceased to be well-wired furniture. Therefore, those models of wired furniture placed on exhibition must be taken for what they are, "display pieces" designed to convey the idea, and to set manufacturers and architects to working out the really desirable wired furniture.

The theory of the thing is this; certain pieces of furniture are so closely involved in the use of electrical appliances, that greater convenience and sightliness is gained by having the wiring outlet brought to that article, and there concealed at some suitable point. In the nature of the case, certain furniture especially invites such treatment; for instance, the dining-room table, the tea-wagon, the bed side, the dressing-table—all of which suggest themselves immediately for wiring. Then there are those elaborate combination-pieces of cabinet-making designed to provide self-contained and invisible kitchenettes in the small high-grade apartment, while in one large New York hotel, reading lamps are affixed to every bed.

The electric outlet under the dining-room table is now an old story. Logically, however, the next step was to have the electric wire follow up a table leg, practically hidden by it, and later by the table braces, from which concealment it is then brought out to such point or points of usage at the table as are deemed desirable. Again the plugging-in point can and should be practically concealed by the table-apron, the necessary receptacle being attached to it, thus avoiding the necessity for cutting into the wood of a valuable bit of furniture. Any table, so wired, will give almost no sign of it, except on careful inspection. Similarly a tea-wagon, wired, is of excellent service in informal entertaining since it can then be directly connected to any available convenience outlet on either the porch, in the living-room, in the library, or at the bed-side. And again, a tea-wagon can be so wired that the treatment is practically invisible; the writer has seen one wagon arranged with the necessary sockets placed on hinged boards, underneath the two ends of the wagon. When not in use, these boards are folded back, so that they and the rest of the wiring are entirely concealed by the leaves of the



The ironing board in use. It is not necessary to conceal the wiring for conveniences not classed with furniture

tea-wagon. Indeed, this arrangement is so inconspicuous that it would not be noticeable were the tea-wagon of the type without leaves. Just what articles of furniture should be selected for similar treatment again depends on the old question,—usage and the scale of living, and that is a question which the architect knowing the needs of the individual family, is best prepared to decide.

Rather different from this decorative phase of furniture wiring is the practical end of it, as pertaining to kitchen and laundry equipment. For instance, an outlet located on the kitchen table makes for readiness in use of grinding and mixing machines, silver-buffers and the like. And in the laundry, an electric outlet and switch placed directly upon the ironing-board will tend to force safer connecting and disconnecting of a flat-iron, thus preventing blow-outs and eliminating another source of fire-risk. Here of course, the question of concealing the wiring does not enter; it is merely one of practical advantage in usage.

The articles that follow this introduction will take up each department of house-wiring in the appropriate rooms, indicating what is necessary and what is desirable from the standpoint of usage. Questions of taste will be left to the decorator, fine points of illumination to the illuminating engineer. On a subject which permits wide diversity of opinion, the writer does not expect universal agreement with every detail of the wiring plans to be offered, but he does believe that they represent another step in forwarding the development of a thoroughly practical and adequate system of house-wiring, and one capable of great aesthetic development.

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# BRICK WALLS FOR RESIDENCES*

## A Discussion of Proposed Relaxation of Requirements as Influenced by a Loose Construction of the Term "Residence"

BY CHARLES E. WORTHINGTON

*(Member N. F. P. A.)*

THERE are in the United States about 23,000,000 families out of which about 4,000,000 report to the income tax collectors. Eighty-nine per cent of this 4,000,000 report taxable income of \$3,000 or less, which including exemptions is a stated income of approximately \$5,000.

The 11% with incomes in excess of \$5,000 can take care of themselves. The others feel the pinch in varying degree, but in the main these are able to build when and where they choose without very great regard to small economies. But, with the 19,000,000 families whose income is \$2,000 or less the case is different and public policy requires that their needs be carefully considered.

Governments and other economic authorities recognize the evils of too great a floating population and concede the principle that the citizen bound to the soil and his locality by ties of ownership and direct responsibility is on the whole the most desirable citizen. Therefore, public policy requires all possible encouragement of individual holdings in homes and farms and as far as possible discouragement of landlords in so far as it concerns these. This does *not* extend to commercial construction which is on a totally different basis.

The generally accepted rule is that a family may pay for "rent" (which means not alone rent paid to a landlord but the cost of upkeep of owned property in interest, taxes and repairs) not over 25% of the annual income, which on the average of the 19,000,000 families has been estimated at various amounts generally from \$1200 to \$1400. This "rent" or capitalization in a house occupied by the owner may usually be set at 10% of cost, the landlord, however, having some special expenses in the way of cost of oversight, larger repairs and a necessary provision for periods of vacancy, etc., must exact at least one-half more or 15% (in general the owners of houses built for rental will protest 15% as inadequate). These are of course not accurate figures but accurate enough to serve the purpose.

On this basis one-fourth of \$1200 is \$300 which accepted as a 10% "rental" means that the average home of the 19,000,000 families will cost \$3,000, a cost at present prices involving very strict economy in construction and reacting upon the quality. But it is either this or pay a landlord \$450 or more for equal or inferior accommodations, at the same time relinquishing the family privacy and the duties of ownership that make for good citizenship and better morale.

Possibly we are not concerned directly with morale, yet that does react in increased losses; and all people interested in fire prevention (and reduction of the heavy cost of fire protection) are interested in any measure tending toward a safer class of buildings. In general this would be the result of the substitution of brick for wood in all houses not well isolated from others. It is a problem similar to that of the wooden shingle roof, although of not so much importance.

Therefore, if we can without sacrifice of any real element of general protection encourage the greater use of incombustible materials by regulations tending to reduce building cost, the establishment of such regulations and their uniform application is a duty.

* *Continued from page 162, February 15, 1922.*

ALL questions of fire resistance must be determined by actual impartial test, not by mere unsupported opinions, for not only in this case are we to test the value of materials but also the value of all preconceived opinions, adverse or otherwise. In every step of our prior struggles for betterments such opinions (honest or otherwise) have been the barriers to progress. We need to get away from the rather pleasantly diversified region of "thinks" into the more restricted and monotonous territory of "know." Also we should not be content to let "well enough alone," if for no other reason than that we do not know it is "well enough" or that it may not be bettered. Beliefs or preconceived or established opinions are not always to be relied upon; the most extensive graveyard in the world is that in which discredited beliefs, many of them widely prevalent in their day, are buried.

If we are testing hollow brick walls of eight inch thickness, why not walls of all other clay products? We should know the strength of such walls and the effect of varying loads, for a wall strong enough under ordinary conditions to carry the 50 lb. dwelling load may be entirely inadequate for the 125 lb. load assigned to "light mercantile."

Despite Mr. Carver's statement that brick sizes are well standardized such is not entirely the case, except for face brick which so far as sizes go are practically uniform in the United States and Canada and may probably without exception be regarded as possessing adequate crushing strength. It is not face brick that may be used for $3,000 dwellings, but common brick, even the cheaper soft burned grades, and the sizes of common brick offered, at least in the eastern territory, range from what is known as "New York brick" measuring 7½ x 2 x 3½ in. to brick running 8¼ x 2½ x 3¾ in., the latter exceeding the former in volume by about 50%, which would seem a larger variation than "standardization" would permit.

It must be understood that the term "eight inch wall" is commonly applied to walls the length of one brick in thickness. It is not an exact term. Similar nomenclature was formerly used in the case of fire doors, where doors 1¾ in. thick were almost uniformly designated two inch doors, despite the fact that such doors could not be constructed from dressed lumber of commercial size.

A "ROLOK IDEAL WALL" if constructed of face brick, or what we have called for convenience standard size, contains per unit of three brick 45 cubic inches of brick and 28 of air, if of the New York brick size 37.5 of brick and 26.25 of air which is to say that each superficial square foot of wall, the length of one brick in thickness (disregarding any allowance for mortar) will contain, of New York brick 636 cubic inches of brick and 442.8 of air space, if standard size 710.4 brick and 441.6 air. Aside from the uncertainty involved in the use of the loose wording it will be seen that a "New York" brick wall 50 ft. long and 20 ft. high of this dimension will contain 74,200 cubic inches of brick less than one of standard brick, the deficiency being equal to about 1000 "standard" brick.

Taking the same tables the crushing strength (or rather resistance) of brick on edge varies from 119 tons to 1926 tons, which would suggest that for all weights under consideration this factor need not be considered.

There are no tables as regards absorption of moisture and increase of weight thereby, but we do not suggest that the weight increase would form a hazard, although doubtless the generation of steam in the interior of the more absorbent bricks under exposure to heat might affect stability materially. This is an important factor when the matter of direct plastering is concerned, for the evidence that transmission of dampness is entirely through the mortar is unconvincing.

All of these differences affect wall stability: volume of solid brick, moisture absorption and dimensions, not so much in solid walls where the factor of safety is very large but possibly in hollow walls where that factor is reduced and floor weights and the thrust from them are to be considered. These matters may not be considered at length but are quoted more for the purpose of emphasizing the need of incorporating some provision at least for standardizing brick sizes in any specifications in ordinances, and also that they should be considered in tests.

Plaster on wood furring and lath is simply an air space partly lined with moisture *absorbing* (not transmitting) material and enclosed in a sheathing usually more freely permeable to air than brick.

This permeability applies to ordinary brown mortar applied direct, but if transmission of moisture is considerable this will lose its adhesive qualities. Certain "hard plasters" are understood to be free from this objection, but probably as a rule hard plaster or "three coat" work would be more costly than lath and plaster on furring. The extent to which fire hazard is increased by the ordinary furring and lath is a subject of divergent opinion. It would seem (theoretically at least) that hollow walls would avoid the moisture trouble in the main.

This discussion has been confined to brick, but in general the same principles apply to hollow tile, interlocking tile and the many other applications of clay products. They vary so much between themselves that space forbids specific consideration.

Some of these are cast with heavy webs and small air spaces, others with thinner walls are *alleged* to show a disposition to crack, or even pulverize, if water is applied while heated. It is not improbable that many of these are fair equivalents of hollow brick construction and can be safely used under restriction, a matter that must be determined by test for individual types of construction. No one at this time can presume to decide this positively.

The committee nationally appointed to consider the standardization of building codes is able to handle these questions better than any individual or ordinary group, and it is certainly not with the intent of instructing that committee that this has been written.

That with the proper spacing, sides, front and rear necessary for sanitation it is not possible to create a "congested district" out of private residences with non-combustible walls and roofs hardly needs assertion or demonstration; nor does the present economic need of favoring such construction.

*But to concede any relaxation of the standards applying to mercantile construction, however plausible the plea may be, is to let down the bars to future "congested districts" of less substantial construction than are generally provided by existing laws, which existing laws are generally regarded as inadequate.* Tenements, apartments and the like are commercial undertakings and in general are not a permanent factor to be considered in connection with the housing shortage. To favor their construction is indirectly to favor increase of floating population, of itself undesirable. That these are necessary and indispensable must of course be conceded but that does not change their status as commercial construction.

IT is so easy to raise such questions as to the construction of dwellings in already congested districts as a means of befogging discussion that it will certainly be resorted to very largely. Nevertheless it is entirely safe to assert that with proper sanitary spacing this matter can be left entirely to natural law and the practical impossibility from a financial standpoint of such construction where it could be considered objectionable.

We have had a good many years of experience with "fire limits," as usually defined, waiting until a certain district is almost completely built over with combustible construction and then drawing an imaginary line about that congested area prohibiting more wooden construction within that area, but permitting the growth of a ring of congestion about it. This has usually worked to the very great advantage of certain real estate interests in such particular localities but has not been conducive to present or future safety or to permanent public interest. Maybe it was the best that could be done under the circumstances, who can say? But *then* is never *now*.

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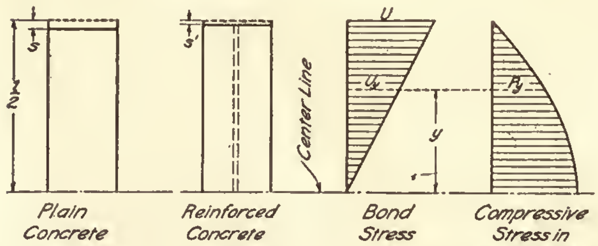
# SHRINKAGE STRESSES IN REINFORCED CONCRETE

THE use of steel reinforcement in concrete is justified by the fact that the two materials have practically equal coefficients of expansion. For hard Bessemer steel an average value is 0.0000056 and for soft Bessemer steel an average value is of 0.0000063. Bulletin No. 126 of the Engineering Experiment Station, Univversity of Illinois, entitled "A Study of the Effect of Moisture Content Upon the Expansion and Contraction of Plain and Reinforced Concrete," by Torata Matsumoto, contains the latest data on the coefficient of expansion for concrete. The author as the result of careful tests says:

"The results obtained indicate that the coefficient of expansion of mortar and concrete is practically the same for different proportions and ages provided that the same materials are used in all mixtures. The average values of the coefficient of expansion of 1:1, 1:2, and 1:3 mortar, and 1:1:2, 1:2:4, and 1:3:6 concrete, varied from 0.0000050 to 0.0000058 for one degree Fahrenheit, with no particular variation with the age or with the richness of the mixture."

Reinforced concrete is ideal for the interior of buildings in which fairly uniform temperatures are maintained. The poor appearance of faultily executed work on outside structures such as walls, piers, bridges, wharves, etc., leads to the conclusion that the temperature coefficient of expansion has a rival in the moisture coefficient of expansion. Moisture content has the undesirable property of affecting concrete alone; the steel remains unchanged with changes in moisture conditions. Changes in moisture content introduce secondary stresses and Mr. Matsumoto made experiments, the results of some of which are contained in the above mentioned bulletin, in order to determine their magnitude and discover means to circumvent them.

The accompanying cut shows the restraining effect on expansion and contraction exerted by longitudinal reinforcement. Each figure represents one-half the length of a specimen. When a plain concrete specimen is dried out in air all particles have a tendency to move toward the middle of the prism, the amount being indicated by the space between the solid line and dotted line at the upper end. The reinforced concrete specimen illustrates the restraining influence of reinforcement. Since resistance to this displacement actually is offered by the bond resistance between the concrete and the bar, the bond stress developed should be proportional to the amount of the tendency toward displacement. This bond stress is, therefore, greatest at the end of the bar and smallest at the center. If there is no slipping of the bar, a fairly reasonable assumption is that the bond stress varies uniformly from a maximum at the end of the bar to zero at the middle of the length of the bar. The shrinkage stresses in the steel and concrete are found to be directly




Half length of specimen. Bond stress is maximum at end and compressive stress in concrete is maximum at mid-length

proportional to the amount of shrinkage in plain concrete. The stress in the steel decreases and the stress in the concrete increases with an increase in the percentage of reinforcement.

The pamphlet is deserving of careful study. The author lightly passes over some tests on limestone, which appear to the writer of this review as possessing great significance.

A lean limestone concrete may prove to be a valuable covering for reinforced concrete in exposed situations provided the matrix contains a special cement, perhaps one high in iron. The author offers the following comments; part of them relate to the concrete used in the tests and part are inferences based on his general experience and observation:

1. Concrete expands when it absorbs moisture and contracts when it is dried. Concrete of a 1 : 2 : 4 mixture is likely to contract during hardening as much as 0.05 per cent in an ordinary structure.

2. Contraction of concrete by the loss of moisture causes stress in the concrete when it is restrained by an external force. The amount of this stress is not as small as is generally supposed.

3. The shrinkage stress caused in the steel in reinforced concrete may reach the usually accepted working stress of steel when the amount of reinforcement is less than 1.5 per cent.

4. The shrinkage stress developed in 1 : 2 : 4 concrete may reach the ultimate tensile strength of the concrete when the amount of reinforcement is greater than 1.5 per cent. With richer mixture the increase in shrinkage stress may be relatively greater than the increase in ultimate strength.

5. The greater the percentage of reinforcement the greater the tensile stress that may develop in the concrete, and concrete having a higher percentage of reinforcement than 1.5 per cent is likely to have cracks formed unless proper provision is made.

6. In reinforced concrete out of doors, subject to alternate wet and dry conditions, cracks may readily be formed under the repeated stress which is nearly equal to the tensile strength of the concrete.

7. Reinforced concrete does not appear likely to be a durable material in a place where a corrosive influence on steel, such as sea air, is active, unless proper protection against the formation of shrinkage cracks is made.

8. It is suggested that the prevention of shrinkage stress in concrete might be accomplished in two ways, either by finding a cement giving less expansion and contraction, or by the use of a perfect waterproofing treatment.

9. It may be expected that an integral waterproofing compound might lessen the change of volume for a short time, but it would not prevent the final diffusion of moisture with consequent change in volume.

### Promoting the Sale of Brick

At the annual brick convention at St. Louis recently Mr. Ralph P. Stoddard, Secretary of the Common Brick Association of Cleveland, mentioned a scheme now being worked out, whereby any responsible head of a family of good character who desires to own his own home will be aided from a central million dollar fund subscribed by the brick industry. Each loan must be approved by the local brick manufacturer and by a responsible local bank or building and loan association, which latter will have the actual handling of the money. This loan will help fill the gap between the amount normally loaned on construction and the cost of the house. Loans will be made only on houses with brick walls.

This action on the part of the brick manufacturers is added proof of the belief that no great reductions in wages and cost of materials may be counted upon for at least five years.

### Fire Tests of Concrete Columns

The Bureau of Standards announces that the manuscript is now nearly completed for a Bureau Technologic Paper containing a complete report on the investigation on the fire resisting quality of concrete columns.

### New Stadium for the University of Pennsylvania

MR. CHARLES KLAUDER, Architect, Philadelphia, Pa., is architect for the new steel and concrete stadium to be erected on Franklin Field, University of Pennsylvania, Philadelphia. The stadium will seat sixty thousand spectators and is to be completed in time for the Army-Navy Football Game in the Fall in 1922.

The engineering plans are now in progress in the offices of McClellan & Campion and Gavin Haddon, Philadelphia and New York. Mr. Haddon was a Captain of Engineers in France and Wm. H. Gravell, of the firm of McClellan & Campion, was a Major of Engineers in France during the war. Major Gravell was the author of an article on Light Weight Concrete Floors in THE AMERICAN ARCHITECT, Dec. 7, 1921.

### A New High Explosive

FROM Brazil comes the report of the development of a new explosive for blasting purposes, with possible value in war. The name of Brazilite has been given to it and the reports of recent tests indicate that it is safer and more powerful than dynamite. When detonated no gases, prejudicial to operators are given off. All mechanical and chemical tests were passed successfully without explosion. It can be detonated only in a certain manner. In one of the experiments 12.4 pounds were placed in an ordinary bored hole having a depth of 15.26 feet, the detonation displacing 262 cubic yards of granite.

### Drilling With Soft Iron

A WRITER in *Tilecraft* tells about a contractor who discovered that one of his men was drilling holes in tile bathroom fixtures about four times as fast as the other workers. Asked to explain his method, the worker demonstrated how cut nails were used in place of the ordinary twist drill. He filed the heads of two nails so that the nails would lie close together, and put them into his brace as he would a drill. He started the hole with the point of a screw driver or similar tool, and then applied the nails, which penetrated into the tile much faster and with less loss than the twist drill. When the nails become dull, a new pair is inserted.

### Chimneys and Fireplaces

A BULLETIN with this title, written by A. M. Daniels, M. E., has been issued by the U. S. Department of Agriculture.

Though the use of the fireplace is one of the oldest methods of house heating there are few who understand the principles of its action. No defect in the construction of the house detracts more from the comfort of the home and none is a greater menace to life and property than a poor chimney and fireplace.

### The Cost of Buildings

THE following figures show the distribution of labor costs in a six-room house used for dwelling purposes.

TOTAL LABOR COST, 100%

| Trade. | Frame House. | Brick House. |
|---|---|---|
| Carpenter | 49.6 | 32.2 |
| Bricklayer | 6.2 | 21.5 |
| Hod carrier | 2.2 | 6.7 |
| Plasterers | 7.9 | 8.8 |
| Plumbers | 8.7 | 7.6 |
| Electricians | 2.6 | 2.5 |
| Painters | 10.0 | 6.3 |
| Common labor | 6.3 | 9.9 |
| All others | 6.5 | 4.5 |
| Total | 100.0 | 100.0 |

The figures are given out by the Division of Building and Housing, U. S. Department of Labor and are the result of a study of labor costs on a large number of six-room brick and frame houses throughout the country. The figures are general and are an average of percentages in various localities.

It is hoped that within a short time the costs of materials and the distribution of costs of classes of work, including labor, will be published. At present based on the assumption that the labor cost on a building is one-half the total cost, the cost for material only for various items may be roughly approximated from the above data.

In the New Building Estimator by William Arthur the following average distributions of cost are given for a large number of all classes of buildings.

| Class of Work | Frame Buildings | Brick Buildings |
|---|---|---|
| Excavation, Brick and Cut Stone | 15.8 | 41.0 |
| Plaster | 8.3 | 5.6 |
| Lumber | 19.3 | 11.0 |
| Millwork and Glass | 20.6 | 12.0 |
| Carpenter Labor | 17.9 | 9.0 |
| Hardware | 3.5 | 2.5 |
| Tin and Galvanized Iron | 2.3 | 3.0 |
| Plumbing and Gas Fitting | 6.8 | 4.3 |
| Paint | 5.5 | 3.4 |
| Iron and Steel | | 5.6 |
| Roofing | | 2.6 |
| Total | 100.0 | 100.0 |

For five good brick houses ranging in cost from $8,200 to $38,000, built about 25 years ago, the following averages were obtained,

| Class of Work | |
|---|---|
| Excavation, Brick and Stone | 36.58 |
| Plaster | 5.98 |
| Millwork and Glass | 19.68 |
| Lumber | 11.76 |
| Carpenter Labor | 9.25 |
| Paint | 5.58 |
| Hardware | 3.10 |
| Tin and Slate | 4.60 |
| Plumbing, Gas, Etc. | 3.47 |
| Total | 100.00 |

The best that can be said for averages is that they are better than nothing and may be of value in making preliminary estimates. Tables of average costs are helpful only for limited areas within defined localities.

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

THE *Architectural Record, January.* The opening article is the first of a series on Architectural Polychromy by Leon V. Solon. It is a little early to speak critically of Mr. Solon's work, as the present article is only introductory, but it is encouraging to find a paper of this kind in an architectural magazine. Such magazines nowadays are mostly pictorial, and it is to be supposed that their editors make them so because the bulk of their readers demand that sort of thing. And so when a serious article, which should be of interest to the profession generally, is published, it must, if it is to be read at all, be written so simply and entertainingly that the casual reader will be encouraged to finish it, and attention must be drawn to it by illustrations. That such a state of things should exist is a sad commentary on modern taste, but it does exist. We are all of us the victims of hand feeding. Everything is canned and then highly spiced and fed to us in a somewhat diluted but easily digested mess. We may, and I think we probably will, get fed up with it, and return to the earlier and more difficult but better method, but until we do, articles on such subjects as Polychromy will have to be a little more simply written than is Mr. Solon's, in order to be generally popular. The illustrations, which have nothing particular to do with the introduction and which are palpably inserted for the reasons above described, are interesting, but as only the frontispiece is in color, convey little impression, to the lay reader at least, of what it is all about.

From "The Architectural Review, London"

The Steps at Azzano, Lago di Como

There are some good photographs of a house in California made from a clubhouse originally designed by Francis Wilson and remodelled by Reginald D. Johnson, Mr. Johnson's part, as the article has it, being "mainly one of pure design." Unfortunately there is no photograph of the building as it originally was, so it is difficult to estimate just how much pure design was contributed by Mr. Johnson, but from the illustrations the results are good.

The Hanna Building in Cleveland, by Charles A. Platt, is described in an article and rather fully illustrated. The building is a simple, strong, rusticated structure which is capable of sustaining the heavy projecting cornice, is well proportioned and devoid of useless ornamentation. The New York Zoning Laws have led to very general abolition of the cornice on high buildings and to a more rational finish of the upper stories, but the Hanna Building is not so very tall as office buildings go, and is of such generous proportions, with a frontage on three streets, that the heavy cornice is not objectionable, but on the contrary, is a decided feature in the design.

Clarence W. Brazer has a small War Memorial which is not particularly happy in its shape, and there are two illustrations of the Federal Reserve Bank in Richmond by Sill, Buckler, and Fenhagen which are remarkably interesting, but so fragmentary that the complete design cannot be determined. Welles Bosworth has a photograph of the Scarborough School which is a very charming soft-focus picture in which there is a decorative tree, a lamp, some steps and a boy running down them, but very little school.

Francis A. Nelson's Huguenot Memorial Church has been noticed in a previous review as one of the good results of competition. The photographs show one questionable thing which of course is not confined to Mr. Nelson's work, but which is general to most similar structures; the use of carefully finished and more or less elaborately detailed cut stone work in conjunction with rock faced ashlar. Of course there are numerous precedents for it, but in the old examples time and ivy have done their part and the church has pulled together; but in spite of the precedents, it is probable Mr. Nelson could have obtained a finer effect with much less trimming. Just how the tracery could have been done this reviewer refuses to commit himself, but it would have been interesting to have tried it.

Harold Eberlein has another article on Italian Villas, this time on the Poggio Torselli built in the 17th Century Baroque. It is commonplace enough and hardly seems worth publishing, although there is a view of the entrance to the Chapel which is not only a good photograph but an interesting composition. There is also an article by Mildred Stapley about a statue in Siguenza, Spain, which is worth reading and some views of La Rabaterie, near Tours, a picturesque place which owes its chief interest to the fact that it was once the home of Olivier le Daim, or more colloquially, le Diable. One thing is certain, Olivier never practiced his first profession in that house because he never could have gotten enough light but it was admirably suited to his last.

*The Architectural Forum, January,* is devoted chiefly to Banks, and Alfred Hopkins opens the number with "Some Ideas on Bank Buildings—Artistic and Practical." The practical ideas have been expressed many times before in greater detail and it is always difficult to illustrate one's artistic ideas by pictures of one's own work. The exterior of the Adirondack Trust Co. Building is not very novel but is simple and good and the sketch for a Mt. Kisco Bank looks promising, but Mr. Hopkins' banks have not the distinction that is present to a remarkable degree in his farm buildings and country work.

From "The Architectural Review, London"

Olive-Tree at Varenna, Lago di Como

Walker and Gillette have some illustrations of the interior of the New York Trust Co., the feature of which is the treatment of the four structural columns in the public space. The room is in the lower story of an office building and the architects in their desire to give an effect of greater height have omitted all entablature over the columns and have finished the ceiling in flat panels a few inches above the top of the caps, the mouldings of the slightly irregular octagonal panel over the column being reversed to come down on top of the cap, the panel itself being merely one of many similar panels with which the ceiling is covered. It is an interesting attempt and well executed, but the result is not satisfactory. The columns appear detached from the ceiling and are casual. In McKim, Mead and White's Banking Room for the Uptown Branch of the City National Bank, a somewhat similar condition existed and was solved by them in the usual and conventional manner, with generally better results.

There seems to be a great demand for the publication of Italian Villas for in this number we have the Villa Velluti, number five in the Villas of the Veneto series. It is a rather late example and has nothing particular to recommend it, the main elevation being bare and without charm, with a curious arrangement of dormers at the apex of the roof. The dependencies, however, are very picturesque and charming.

The Stanford White Memorial Doors in the Library of the New York University, designed by his son, Lawrence Grant White, are a very good solution of the practical problem of a built up door and are well modeled.

Under the heading "Straight Talks to Architects," C. Stanley Taylor takes up the old, old story of professional charges. It has been threshed over thousands of times, and will be what is known as a live topic when the Millenium comes. Mr. Taylor's article is interesting and what it has to say is well said if not novel, but who shall say what is the right way? Each man will do more or less what he pleases; but it should not be forgotten that the flat fee rate has obtained a certain recognition as a legal precedent which is not lightly to be thrown away. Mr. Taylor seems to think owners give greater care to the selection of their architects now and demand greater service than formerly. They certainly demand more services but do they exercise more care in their selection? We think not. Certainly not in proportion to the services they demand. Mr. Taylor

From "The Architectural Forum"

Detail of Officers' Space
Uptown Branch Building, National City Bank, New York
McKim, Mead & White, Architects

also touches lightly on the matter of ethics in "competing knowingly for employment on the basis of professional charges." It is a very delicate point, that, and one that the Institute is now attempting to define. There may be a ruling found that will fit all cases but no one but the architect himself is competent to tell what his services are worth for one particular piece of work at one particular time.

*Architecture, January.* The frontispiece is an excellent photograph of the Lafayette Memorial in Prospect Park, by Daniel Chester French, the architectural work being done by Henry Bacon. It is well modeled and well composed, but the slightly segmental head which is a beautiful line in the bronze tablet becomes unmeaningly bent in

From "The Architectural Review London"

Manitoba Parliament Building, Winnipeg

the unbroken cornice above. The Lafayette Statue, at the college of the same name, is in a way the same as the central figure on the Prospect Park tablet, but is even finer, the statue silhouetting beautifully against a circular head white door some distance behind it.

Murray P. Corse's article on "Puritan Architecture" is carefully written and of interest. The Chemung Trust Co. by Dennison and Hirons is good and rather unusual, especially the treatment of the ceiling. The ceiling panel is very effective but the painted decorations in the vaults seem rather light in character and detail.

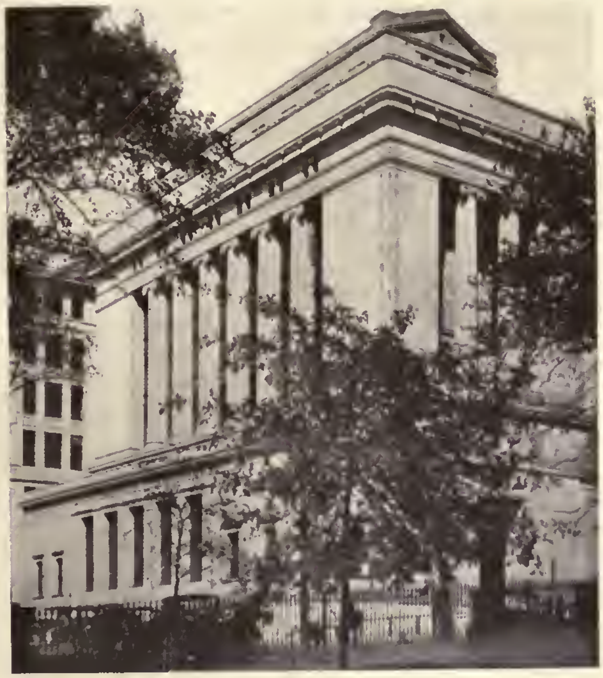
From "The Architectural Record"

Chapel Entrance, at East Side of North Front
Poggio Torselli, San Casciano, Val Di Pesa, Italy

St. Michael's Church, Litchfield, Conn., by Rossiter and Muller is a very successful building, simple and well proportioned. The interior view of the nave seems a little bare and the contrast between the woodwork of the ceiling and the plaster of the side walls is rather abrupt, though much of this effect may be due to the flashlight photograph. There is an article on the life and work of the famous French cabinet maker, André-Charles Boulle, which is interesting.

*The Architectural Review, London, January.*

From "The Architectural Record"



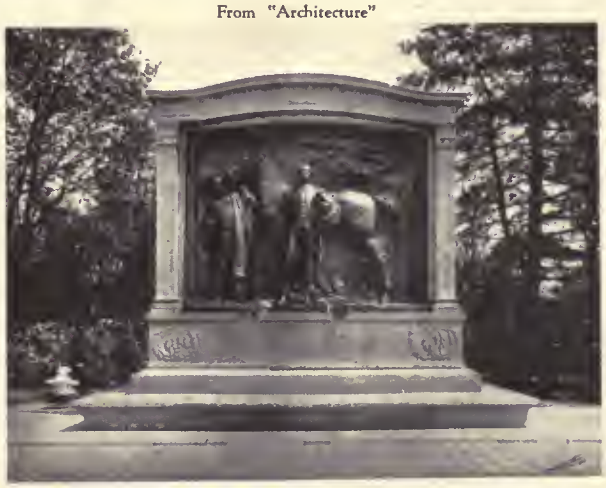
Federal Reserve Bank, Richmond, Va.
Sill, Buckler & Fenhagen, Architects

The feature of this issue is the Manitoba Parliament Building, Winnipeg, the architect of which is Mr. Frank Worthington Simon, F. R. I. B. A. The plan is an unusual one for a monumental building, being H shaped, and is about 335 feet square. The projecting wings which form the sides of the H are relatively thin as they consist of two rows of offices with a central corridor; the corridors are continuous and the lighting excellent; in fact it seems a very practical plan indeed. But it is not a monumental plan. The wings are as high as the central portion and the composition, therefore, does not mass, and although a quartering view is not given, the general effect cannot be good. There is a central dome which is flanked on one side by a monumental stairway and on the other by the Legislative Hall. The dome is not high and has no pendentatives, but is carried directly on two coupled columns at the angles. The outside dome is only for exterior effect as the inner dome does not come higher than its base. The exterior is simple and the fenestration good but the dome itself is not so successful. It is more a scheme for a lantern than a dome and the top of the dome, which is apparently gilded, is too flat. The semicircular head opening in the box of the dome seems to give light through a panel in the inner dome which is also apparently lighted from an oculus in the center. In size this building compares with some of our later State Capitols, possibly one-fifth smaller than the Missouri State Capitol, and as it was built at practically the same period a comparison of the cost is interesting. The Missouri State Capitol cost about $.35 a square foot and the Winnipeg Building $1.15 a square foot, the total cost of the one being somewhat over three million dollars and the other over eight million dollars.

There is also an article on Pergolesi and Robert Adam, on the disputed question as to whether Pergolesi did or did not do Adam's work for him, and there are some very remarkable photographs of Italian Scenery by H. R. Campion, two of which are herein reproduced.

*The Architects' Journal, London, December* 14, takes up the question of higher buildings for London and gives interviews for and against. At present the London Building Act limits the height to 80 feet, and the new propositions are to increase this to 120 or 150 feet. It seems a pity, but probably they will do it. In this number is also illustrated the premiated design for the Birmingham Hall of Memory, a memorial to those who fell in the War, which was won by S. N. Cooke, and W. N. Twist, FF. R. I. B. A.—a small domical structure containing a cenotaph. The only thing remarkable about the design is the introduction of a row of windows in the attic which are certainly no advantage to the elevation and which light nothing inside.

From "Architecture"



Lafayette Memorial, Prospect Park, Brooklyn, N.Y.
Daniel Chester Frank, Sculptor Henry Bacon, Architect

*The Western Architect, December,* contains nothing of interest but some rather spectacular drawings for a Mausoleum in California by Willis Polk.

# THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago, Ill.



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*Publishers,* The American Architect and The Architectural Review

### The Winter Conference

THE Winter Conference was held on the evening of February 10 at the Chicago Engineers' Club, Chicago.

Mr. E. B. Wilson, president of the American Bureau of Inspections and Tests read the following paper.

Mr. President and Gentlemen:

I would like to preface my remarks with the statement that ten years ago the building of concrete roads was started, and at that time about as much thought was given to concrete for roads as the average contractor today gives to concrete for buildings. Concrete roads were built in 1910 and 1911 and were topped in 1912. It was pretty quickly seen that such roads must be constructed better or the use of concrete in highway construction would stop. We all know what the road program now is. The point is that bad concrete shows up in road construction, while in building work the first intimation that the structure has only a fraction of the strength desired and paid for, comes through a collapse.

In 1918 the Structural Material Research Laboratory brought out its Bulletin No. 1, entitled "Design of Concrete Mixtures," as a result of Professor Abrams' tests and investigations. This was the first real step toward better concrete in building work. In June, 1921 the Joint Committee on Specifications for Concrete and Reinforced Concrete, presented to the engineering profession a Progress Report which includes tables showing the proportionings required for concrete of given strength, using several different gradings of fine and coarse aggregate and different consistencies. From these tables which are based on the work of Professor Abrams, it can be seen that in order to secure a 2000 pound compressive strength concrete at 28 days, when using a 0 to No. 28 fine aggregate and No. 4 to 3/4″ coarse aggregate and a slump of 8″ to 10″, the proportions should be 1 : 0.8 : 1.9, while for the same strength concrete of the same age using 0 to No. 4 fine aggregate, 3/4″ to 2″ coarse aggregate and 3″ to 4″ slump, the proportioning should be 1 : 3.1 : 4.3. The latter mix which, of course, would not be interchangeable with the former in most instances, takes about one-third as much cement as the former for the same strength results. The worst element entering this variation is the water, and the same table shows that when using 0 to No. 4 fine aggregate and No. 4 to 1½″ coarse aggregate and a slump of 6 to 7 inches, the proportioning should be 1 : 1.7 : 3.4, and with the same aggregate and a slump of 8 to 10 inches, it should be 1 : 1.0 : 2.4 or an increase of over 30% in the amount of cement required, because of the addition of approximately 20% water. The 6 to 7 slump is sufficient for most work, but it is only too true that slumps from 8 to 10 and even worse, if the consistency could be similarly measured, are being tolerated on most of the structures now being built. These tables show that under conditions existing in Chicago, the strength of the average concrete can be increased 30% by either adding 30% cement or eliminating 20% of the water.

The method of making the slump test is covered by a standard of the American Society for Testing Materials. A truncated cone shaped metal mold, 12″ high, 8″ in diameter at the base and 4" in diameter at the top and provided with handles at the sides, is filled with the concrete at the point of deposit, the concrete being introduced into the mold in several layers, and lightly tamped, after which the mold is removed vertically and the slump or settlement of the concrete is noted. This test is the most practical one yet devolved for maintaining uniform consistency of concrete. The greater the slump, the weaker the concrete. It is evident, therefore, that the least water possible should be used in providing a concrete that can be satisfactorily deposited.

The specifications submitted tonight by the Specification Institute for discussion, appear to be a very reasonable interpretation of the recommendations embodied in the Joint Committee Progress Report. The features embodied, which present the greatest difficulty of operation, is the use of fractional proportioning, accurate measurements of aggregates and the changing of the proportioning readily when necessary because of variations in aggregate grading and changes in the consistency or workability of the concrete.

There is now under way in Chicago the construction of a building under specifications for concrete which are almost identical in substance with those presented tonight. They were drafted from the Joint Committee Progress Report and include positive measurement of aggregates, control of operation of mixer and require fixed consistency. Field control consisting of progressive sieve analysis, slump tests and compression tests are also provided for. The contractor, having modern mixers, had only to consider especially the positive measurement of the aggregates required to be done in a measuring charging hopper or skip.

Special batch boxes and skips to meet this end have been developed by the speaker, and for this particular job a wooden rectangular batch box with two movable partitions and drop bottom has been adopted. The total capacity of the two end compartments is fixed at the capacity of the mixer, materials measured loose. As will be explained later, however, provisions have been made for varying this total capacity when not operating the mixer to capacity.

This box is placed directly over the batch hopper accompanying the mixer; one end compartment is used for the coarse aggregate and the other for the fine aggregate and cement. The box is charged by dumping from wheel-barrows over the ends of the box, the cement being placed between two layers of fine aggregate to reduce the loose volume of the cement to approximately one cubic foot. The partitions are higher than the sides to prevent overflow of aggregate into the center compartment, which compartment, by the way, may be used for the cement, if desired. A strike board mounted on a handle, similar to a hoe, is provided and each partition is constructed with a shelf on the near side, as a bearing for one end of the strike board. With the partitions set to provide the required amount of coarse aggregate in one compartment and fine aggregate plus cement in the other, no measuring has to be done with the exception of the cement, a sack of which is considered to be one cubic foot. The aggregates are leveled off with the strike board and the excess is pushed back for use in the next batch.

As a part of the field control instructions issued by us for a job, there is included a work sheet which simplifies the application of the finer proportioning. In this case work sheet "D" is used. It requires only knowledge of the mixer capacity, the sectional area of the batch box, and the grading of the aggregates intended to be used. Simple formulae are used to determine the length of each compartment for each particular mix and slump; also the compartment lengths can be readily figured to permit a reduced charge for the mixer, which will often be found to be necessary unless sacks of cement are split. Splitting should be done by weight only. Through the use of the work sheet it is possible to schedule for the inspector on the job, in a very few minutes after the grading of the aggregates is known, (1) the number of sacks of cement to be used and (2) the length of the aggregate compartments for several combinations of aggregates under two or more consistency conditions. The partitions in the box can be changed as quickly as they can be unbolted and secured in the new positions.

The principle involved in the construction of the batch box described is applicable to several different forms of batch boxes, as well as to skips for side loading, and to measuring wheel-barrows, none of which, however, would be required in the case of large jobs where it is practical to employ storage bins and aggregate weighing device. The speaker has not seen any measuring gate or device which is adaptable to conditions surrounding building construction in general, and which would in any sense meet the needs of finer proportioning as covered by the specifications under discussion.

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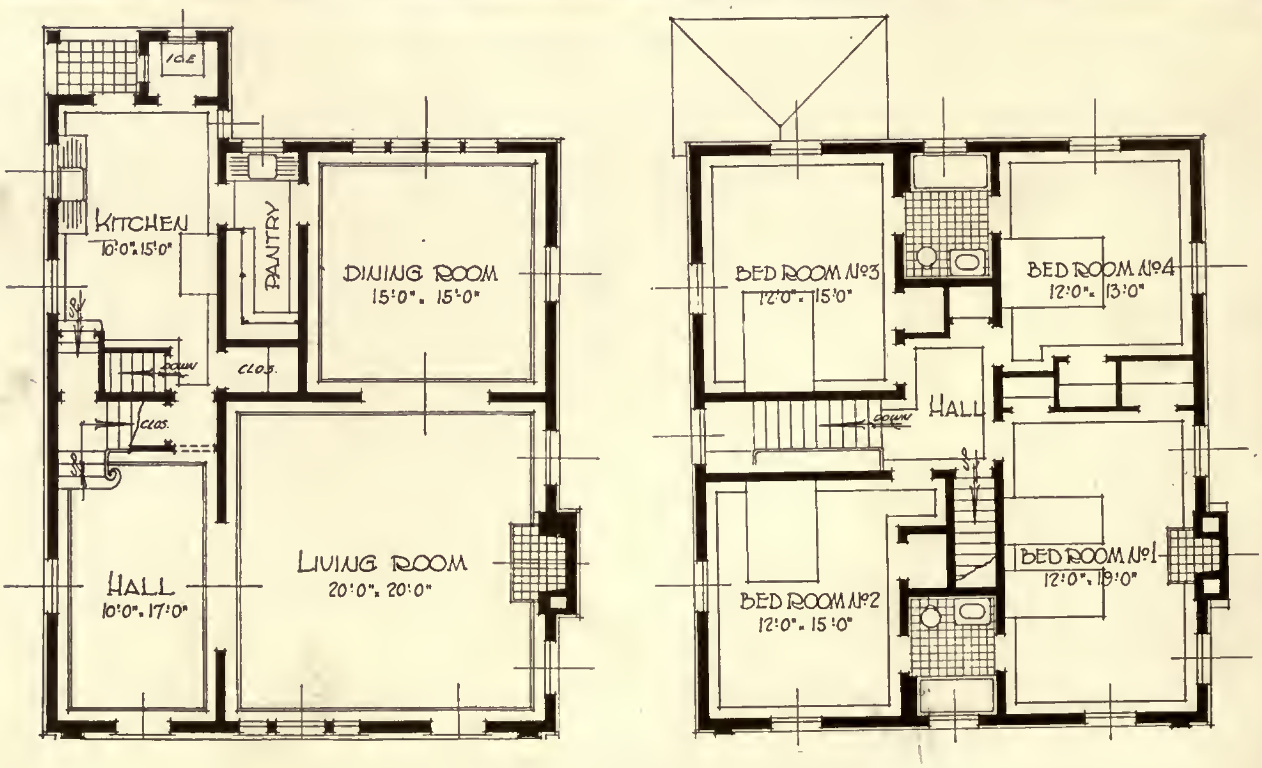


HOUSE OF WALTER MERRITT, ESQ., TENAFLY, N. J.

R. C. HUNTER & BRO., ARCHITECTS

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TOWER OF ST. MICHAEL, SARAGOSSA

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI | WEDNESDAY, MARCH 15, 1922 | NUMBER 2389


# COLONIAL DOORWAYS FROM A LAYMAN'S STANDPOINT

BY CHARLES LYMAN SMITH

### Illustrated by a series of doorways chronologically arranged and reproduced from photographs by the author

STIMULATED and inspired by excellent teachers, the writer in his early student days aspired to become an architect, and eagerly anticipated continuing his apparent inclinations along those lines by further courses at home and abroad. A stern New England parent of the old school, who considered dollars more desirable than the precarious prospects of an architect, and who looked askance at the caprices of the Beaux-Arts, Montmartre and the Latin Quarter, willed otherwise; and a long apprenticeship in an uncongenial business career resulted.

After years of patient plodding, interspersed with hurried trips to Europe, which strengthened and developed the old love, conditions brought about a leisure which sought gratification in the pursuit of a long cherished hobby,—the collection of photographs and data pertaining to domestic architecture of the early New England Colonies.

A. D. 1720
Buckminster House, Portsmouth, N. H.

With a boon companion on many a long hike, the vigor and charm of a perfect day spent in the open, the lure and pleasure in finding old houses redolent with memories of some stirring historical event or associated with a well known celebrity, the quest soon became a fascination not to be denied, and architectural features both old and new aroused the keenest interest.

In our native town of Boston, Bulfinch, of State House fame, has left many enduring examples of his genius. The so-called Beacon Hill section of the city is rich in fine old doorways, where one may study the fluted columns and pilasters with their Doric, Ionic and Corinthian capitals, classic pediment, and the ornamentation characteristic of the best Georgian façades. Henry James once termed Mount Vernon Street the happiest street scene our country could show, respectable in a degree unsurpassed among outward pomps.

The nearby suburbs still may boast of unique examples of the homes of forebears, while one need go no further than towns as easily accessible as Salem, Marblehead and Newburyport, not to mention others, to find perfect examples of the so-called Colonial style, from the early lean-to house to that of the square three story mansion of wood or brick.

The pursuit of any subject begets a craving for greater knowledge, and one soon finds himself eagerly seeking such sources of information as will give a keener understanding and larger enjoyment. Thus the horizon is continually broadening, and one is never satisfied until he acquires that which seems perhaps just beyond his reach.

Even for the layman, a certain knowledge of the development of domestic architecture is necessary to a true enjoyment of the subject, and we must study a few of its details.

The New England Puritans, struggling for existence in a bleak and unknown wilderness, began building the log cabin as a protection from the weather and as security against the marauding Indians. As clearings were made and settlements appeared, the simple house with long sloping lean-to and gambrel roof of pre-Revolutionary days replaced the cruder cabin. Doorways were rudely framed, the doors primitively battened and bolted together without ornament save for the strap hinges of hand forged iron.

Oliver Wendell Holmes, apropos of this style of house, has said of his birthplace in Cambridge, Mass.,

> "Born in a house with a gambrel roof
> Standing still if you must have proof.
> Gambrel? Gambrel? Let me beg
> You'll look at a horse's hinder leg—
> First great angle above the hoof,—
> That's the gambrel; hence gambrel-roof."

As prosperity increased, owing to the flourishing East Indian and slave trade, many seaport towns of the colonies became centers where dwelt wealthy merchants and sea captains. These men were great factors in the progress of local and national affairs, and as their influence and position warranted they built for themselves and their children homes that reflect refinement and taste. These large, square, wooden mansions and those of more stately brick date roughly from about 1784 to 1818.

A. D. 1715
Dummer House, Byfield, Mass.

A. D. 1730
House in Bedford, Mass.

In England, where the court has largely dominated the nation, the Georges, who were German, uneducated, without taste and bourgeois to their fingertips, have given their name to the prevailing classic revival of architecture of that period known as Georgian, but in this country by the general term Colonial. The Georges were fortunate in having for contemporaries such men as Sir Christopher Wren, John Gibbs and Vanburgh among architects, and Grinling Gibbons, Chippendale and other exponents of the allied arts. These men knew the value of classic form, in fact, felt and adapted the styles of the Far East, as well as Greek and Roman, until one is bewildered by the many fine examples of their craftsmanship.

Our northern Colonists had fought their way to wealth, largely at the expense of education, and their homes reflect a free expression of their individuality. On the other hand, the cavaliers of the South were men of inherited wealth. Many of them had received their education in England, had profited by example and study to such a de-

A. D. 1732
Garden Doorway, Royall House, Bedford, Mass.

A. D. 1748
Old State House, Boston, Mass.

A. D. 1745
King Hooper Mansion, Marblehead, Mass.

A. D. 1760
Doorway, Wentworth Gardner Mansion, Portsmouth, N. H.

gree that their homes are more elaborate and show the Georgian influence in many of its most elegant forms. Occasionally in New England, where wealth has been handed down from father to son, we have isolated examples of the southern type, with two storied columned porch, balconies from second story levels, ornate Palladian windows, carved cornice and mouldings.

When the larger square house of the merchant prince was built he wished some striking mark of his hospitality, so the builders added inviting porches of beautiful dimensions, ornamented by classic detail, leaded glass in fanlight and sidelight, and above, a finely proportioned Palladian window to harmonize and to light the stair landing within.

These American doorways were worked out from the best prototypes in England and in Italy, with adaptations and changes suitable for wood construction. The best results are not copies, but have been obtained by thought and originality on the part of the builder, who had no actual data from which to work. Beautiful columns have been used in various forms, pediment pointed or arched, occasionally with scroll or broken arch with the pineapple set in as an emblem of hospitality. The wood carver, like the famous McIntire of Salem, Mass., was called in to embellish capital, architrave, and cornice with tracery of exquisite workmanship.

A. D. 1768
Col. Jeremiah Lee House, Marblehead, Mass.

One cannot wander through these quaint New England towns, in their quiet dignity so eloquent of a glorious past, without being impressed by the charm which these classic doorways lend to an otherwise plain exterior. Most of the

A. D. 1782
Salem, Mass.

A. D. 1782
Assembly Hall, Salem, Mass.

A. D. 1782
Silsbee House, Salem, Mass.

A. D. 1789
Jacob Wendell House, Salem, Mass.

A. D. 1784
Gov. Langdon Mansion, Portsmouth, N. H.

A. D. 1790
Bradbury Spaulding House, Newburyport, Mass.

A. D. 1816
Providence, R. I.

A. D. 1816
Emmerton House, Salem, Mass.

A. D. 1811
Davis House, Newburyport, Mass.

A. D. 1816
A House on Chestnut St., Boston

porches were undoubtedly utilitarian, being added as shelter from the weather. Some are square, a few oblong, others semi-circular. In each case there is a harmony of proportion that seems to lend an air of refinement to the plan and reflects in a large measure the personality of the owner. In a general way the simplicity and barrenness of the Puritan characterize the early period, while later the influence of the architect from over seas is readily traced. Once the eye becomes accustomed to the purest styles it retains an impression of beauty, and the layman, though unable to distinguish the subtle difference in transition, becomes sensitive to the various forms and quite readily classifies the subject.

A. D. 1810
Doorway of a House in Bristol, R. I.

As time goes on these charming examples of early domestic architecture, stamped with the character of our forefathers, will become a source of permanent utility and inspiration. Under the shade of noble elms, that in earlier days looked

A. D. 1806
Gideon Tucker House, Salem, Mass.
Designed by Samuel McIntire

down upon many an historic scene, we may muse over the lessons of a memorable past and adapt them to the usages of the present day. Although the tabulated facts may become dusty and deranged, there still remains our book of prized photographs, as a stimulus to memories of oldtime courtesy, of glimpses of beautiful interiors with graceful stairways, carved mantel, panels and ceilings. But this opens up a vista into Colonial architecture upon which we may not venture. The silent power of recollection of many a weather-stained farmhouse nestling among the hills, or of a quiet, dignified mansion, mellowed by the slanting light of a late summer afternoon, is all pervading and leaves its indelible mark.

Someone has said that architecture is frozen music; the lines of perfect architecture making a harmony as overwhelming and irresistible in appeal as that made by the flowing rhythms of music.

# ARCHITECTURAL EDUCATION
# A TEACHER'S VIEW

BY A. D. F. HAMLIN

*Professor of Architecture, Columbia University*

MR. BLACKALL'S very interesting article on architectural education raises many questions which he is not by any means alone in seeking to solve. These very questions are and have long been subjects of earnest consideration among the professors and instructors of our leading schools of architecture. In the annual meetings of the Association of Collegiate Schools of Architecture, in more informal meetings at the conventions of the Institute of Architects, in occasional discussions between individual instructors of different schools, and in the meetings of the faculties of the schools themselves, there has been for many years constant discussion of the proper relations between the schools and the offices; between the colleges with curricula leading to the Bachelor's degree—that is the schools of liberal culture—and the professional schools; between liberal culture and specialized technical training, and all the related and implied questions of educational relationship. It is proper here to remind practicing architects of a fact which many of them in their discussions of the subject seem to forget; viz., that all the leading Schools of Architecture are directed and mainly officered by architects in active practice. There is a mistaken impression, in some quarters, I think, that the University Schools of Architecture are conducted by dreamers and theorists who have little or no contact with the actualities of the profession, little sympathy with its practical needs and little understanding of the right purposes of professional training. I do not at all attribute this fanciful notion to Mr. Blackall, but it is more or less prevalent, although based on no evidence whatever; it is one of those mistaken impressions which lend themselves so easily to caricature and fault-finding that they keep on circulating in spite of repeated disproof.

In discussing such questions as these it is important to establish clear definitions. Exactly what does Mr. Blackall mean by "culture?" Reading his article through gives the impression that culture to him means little more than the ability to discriminate justly between the good and the bad, the artistic and the inferior, in architectural design and drawing. This is indeed one of the fruits of culture, the result of combined training and experience; but culture, as I think most teachers understand it, is a broader and more fundamental thing; it means that foundation and background of knowledge, experience and taste which comes only from familiar contact with great minds and great achievements, whether of the past or of the present. It is a shaping of the mind which opens to it many windows upon the world of thought and life, so that the man of culture engaged in a profession has a far broader horizon than that which bounds his immediate occupation. It is the aim of the collegiate schools of architecture to supplement the purely technical teaching, which Mr. Blackall calls "subjective"—with such scientific, mathematical and historical instruction, and with such a grounding in the theoretical principles upon which architecture is founded, both as an art and as a profession, as shall put the student in the way of acquiring a mastery of his art and profession, and give him a broad and sympathetic outlook upon other fields of life and knowledge than his own. We try to train the mind as well as the hand and eye; to stimulate the imagination as well as the perceptive faculty; to exercise the reason and to broaden the intellectual and aesthetic interest of the student. Mr. Blackall states our purpose correctly; we do try to train men who can become architects and not mere office draftsmen. Our conception of the place and function of the architect in the community and as a member of a great and noble profession and of architecture itself as one of the highest expressions of intellectual and æsthetic culture is possibly more idealistic than Mr. Blackall thinks it ought to be; but his report of his experience with the school trained men does not convince us that our purpose is wrong or our aim too high. We have doubtless fallen short, far short, of perfect success in our efforts; no one can be more conscious of our shortcomings than ourselves. But we are not yet persuaded that our scheme of education is fundamentally wrong.

## II.

The conditions under which the collegiate and university schools of architecture have developed their curricula are in part responsible for the deficiencies which the professors of architecture themselves recognize in the results of their training. The schools have to deal with the material supplied them. In most of them the boys come directly from the high school; in a few, from colleges, after two to four years of collegiate studies. Hardly one among these young men ever knows how to draw; few of them have any artistic background, or any real conception of what architecture is. For several years Columbia tried to enforce an entrance requirement in free-hand drawing of simple ornament in outline, and some acquaintance with the orders of architecture; we were forced to cancel this requirement because neither the preparatory schools nor the colleges supplied this elementary training. The average entering student's profound ignorance of general history is astonishing. His lack of even the most elementary notions of the history of art is equally deplorable. Those who come from the colleges are, of course, better equipped in some respects; in mathematics, French, ability to express themselves intelligently in English, sometimes in habits of study and ability to reflect and reason; but these men though more mature too often suffer from having too late begun to interest themselves in architecture, and it takes some time for them to get into the true architectural spirit. And we can keep them only four years! We wish we could catch them younger and yet not less well grounded, and keep them longer!

In the Columbia school, to which none but students with at least two years of college credits are admitted, we are trying to accomplish this by starting the college student early in some of the elementary architectural studies. If we could order his two years of required collegiate pre-architectural study as we would like to he would come to his four years of purely professional study after two years of combined collegiate and elementary architectural training, with some real acquaintance with drawing and with the orders, shades and shadows and descriptive geometry, in addition to his French, mathematics, general history, English and economics. Then the four years in the school could be wholly devoted to design, advanced drawing, construction, architectural history, ornament and the decorative arts, theory, and elementary office practice—a large enough program, in all conscience, for four years, and approaching measurably to Mr. Blackall's suggested curriculum. But the prerequisite training above outlined as a desideratum has not yet been made possible.

As it is, with architecture the complex profession that it is, any curriculum must be a compromise. Many desirable things must be left out and attention and effort concentrated on those subjects which are most indespensable and which the schools are best qualified to teach. Everything else must be left to the offices, to the slow acquisitions of long experience. It takes years to train an architect. Neither the offices, nor the schools, nor experience, can alone complete this training.

III.

The crux of Mr. Blackall's criticism of our existing systems of architectural education seems to lie in the question of the proper division of the work of education between the offices and the schools. It is in his answer to this question that most of the professors of architecture, myself included, would part company with him. He would have us "give up the idea that the polishing necessary to real culture can be acquired in school better than it can be acquired in practice"—that is, in the office. Now, if the schools cannot, better than the offices, supply the training essential to real culture, then they have no function at all and might as well be given up. If the young student can acquire this "polish" in the offices of the architects who employ him, where he also acquires his practical experience why should he ever go to a school of architecture? What is there left for the schools to do? Mr. Blackall would confine their work to just three fields—drawing, history of architecture, aesthetics of construction and design. But what are these three if not cultural subjects, studies that stimulate the imagination, enlarge the powers of artistic expression, expand and enrich the mind?

In an earlier paragraph, however, he proposes that the applicant for admission to a school shall be "grounded in the elements of architectural history so that this work in its dry details shall be kept out of the curriculum."

I should like here to raise a query. Where and how is the applicant to obtain this grounding in the elements of architectural history? Certainly not in the offices, which do not care to employ ignorant beginners, and are not equipped to teach them the elements of architectural history if they did employ them. Certainly not in the preparatory schools; where can you find one that undertakes or is qualified to give this teaching? Mr. Blackall speaks of the "dry details" of the subject as being thus eliminated from the school course, and asks that the schools teach architectural history not as "archæology" or as "mere history," but as "applied architectural mechanics"; not in periods but "in relation to individual problems." I cannot of course speak for other schools except from general impressions, but I can speak of the course at Columbia from personal knowledge, and I am sure that for the past thirty years I have not taught architectural history as mere archæology, but have related it to the general history of civilization, to modern problems and to practical design, supplementing it, by the co-operation of the teachers of design, with problems in design to exercise the imagination in the application to practical requirements of the knowledge acquired from lectures and collateral reading and study. I have always insisted that the "periods" of architectural history are mere devices of convenience to aid us in grasping the significance of the whole impressive onward course of the stream of architectural progress, inseparably related to and always expressing the ideals and the culture of the age, and I have sought to make the students acquainted with and interested in the great masterpieces of the art. I have reason to believe that this is the aim and, with differences of detail the method, of the teaching in most or all of our leading schools.

IV.

Mr. Blackall finds that the schools do not teach their students to draw; their graduates have acquired no freedom and mastery of artistic expression. There is truth in this charge, though possibly the deficiency may be less serious than Mr. Blackall thinks it to be. The schools are doing their best to teach their students to draw, but here again we come up against the two great obstacles already mentioned: the deplorable lack of early training in drawing before entrance into the school, and the lack of sufficient hours and years of practice in the four years of the average course.* If Mr. Blackall or any one else can show us the way out of these difficulties and find time for a lot more of practice in drawing without the sacrifice of other essential things, he will relieve us of a problem which is our constant and anxious pre-occupation. I doubt, however, whether results can be greatly improved until drawing is more officially taught in all secondary schools and made a required study in all colleges.

V.

Finally: Mr. Blackall does not want, and says the architects "do not want, potential architects, but we want draftsmen first, and it is our job to make architects out of them." Well then, if that is the case, why do you look to the collegiate schools at all for draftsmen? Why not draw exclusively upon the "subjective" schools? Is it *your* job to make architects out of draftsmen and not equally the job of the collegiate schools? Do you not, on the whole, convert draftsmen into architects, if at all, much more rapidly and satisfactorily when they have been through a collegiate or "objective" school? Do not your "objectively" trained draftsmen, as a rule, advance more rapidly and to higher positions than those with only a "subjective" training?

May I be pardoned for expressing some doubt as to whether many architects do really and seriously consider it "their job" to make architects out of their draftsmen? I doubt very much whether any great number among them devote much time and thought to this altruistic function of teaching their draftsmen, of cultivating their imagination, their powers of observation and expression, their mastery of fundamental theory, their acquaintance with the masterpieces of their art, and I can hardly believe that all architects are averse to employing potential architects as draftsmen or reluctant to take on men who, though it takes them some time at first to acquire familiarity with office methods, thereafter show higher competence than the more immediately available men who have not had the higher architectural schooling. Certainly the schools should consider their duty to the aspiring potential architect as at least equally important with that of serving as employment bureaus for the architects' offices. The overwhelming proportion of school trained men among the higher and highest ranks of the profession proves that the schools have not failed in what they believe to be their true function.

The school cannot impart culture; it can provide the opportunities and means and favoring environment for its acquisition by the student; for the beginnings of a process which will continue in the school of experience. The school cannot teach imagination nor bestow taste; it can supply the suggestions and stimulus, the instruction and criticism which will foster and help develop these in the student who possesses them in the germ. It cannot teach many things which are better learned by actual practice in the office, but it can impart the elements and fundamental notions even of these, as some schools do, with considerable success. Culture, taste, imagination, skill in drawing, familiarity with practical details, these the student must acquire for himself, and it takes long years to master them. The professional school can help him to these in part; the office and the hard school of experience can help him in part. Each of these three kinds of schooling is necessary before the young man can claim to be a competently trained architect.

And now, when all this is said, what is the conclusion? Why, simply this, that Mr. Blackall's ideas and mine—and I think I may say, those of most of the professors of architecture—despite some differences of definition, of emphasis and of detail, are not nearly so far apart as they seemed at first!

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**The duration of the course at Columbia is indeterminate: the "intellectual lockstep" of rigid division of the students and their studies into classes by years was long ago abolished.*

# ARCHITECTURAL EDUCATION

## PART II — THE OFFICE

BY C. H. BLACKALL, F. A. I. A.

UP to less than two generations ago the only architectural education available for the student was that afforded by offices, or something corresponding thereto. In the great creative periods of architecture this was enough, and it surely produced some marvelous results, not wholly, of course, due to the simple system employed, but more probably because of the fact that the system was part of the resulting architecture, and the student grew up inevitably in the footsteps of his master and was able to hand down the principles unbroken to his successors. The schools for teaching architecture as such have not been going long enough to demonstrate that they are all that their best friends claim for them, but no one could deny that as an adjunct of the office, it is possible for them to meet a very important function. Our danger in the past and for the future lies in the fact that we are apt to think the schools will do it all and the offices have no obligation in the matter, whereas the real burden of architectural education rests not upon the schools but upon the offices. The more practicing architects can appreciate this and give of their very best to the young men, treating them as apprentices, as equals and as successors, rather than as mere draughtsmen, the more surely will we be able to develop real architecture. An institution never developed a school of architecture in the broad sense, and even in this country where schools have taken so prominent a part, the real growth of the last twenty-five years has been through the office. One has only to consider the career and the influence of McKim, Mead & White to see how true this statement is. Probably no other one firm has had such influence on the young men as has been exercised by the organization which bears this name, an organization which was so coherent and united in its aims and methods that the death of two of the principals has not brought any perceptible change in the character of the output, and the young men who have graduated from this office and risen to honors and opportunities in the profession, are scattered over the whole country and afford unquestioned proof that this office is a real training field for the young architect. American architecture is singularly coherent. We have sporadic attempts at various styles, but after all, the general trend is here more consistently along the lines of the development which McKim and his associates have made possible, than in any other country. Even France with all its traditions and atelier system is no more consistent in its architectural development than we have been during the past twenty-five years. For that matter it might almost be carried back further in time, for our Colonial architecture, limited and meager as it was, presented many of the marks of a definite, spontaneous application of the right principles to architecture, and in those days there was absolutely nothing but a very meager assortment of books and a few architects who were quite lost in the Colonies.

The position of the architect then should be, and in most cases now is, that he holds a position of trust to his draughtsmen, that they are not mere cogs of the machine, but must be considered as potential architects who are looking to him to receive their inspirations and to develop into that indefinite capacity which we call architecture; that no matter how well they may have been trained in the schools, and no matter how intelligently the schools may have tried to inculcate the spirit of architecture in the young mind, they never in practice get such spirit there, but must look to the office, so that the office experience is properly the post graduate course which every architect must take. We see occasional instances of men who have come out from college, sometimes supplementing by a course in Paris, and have, through the kindness of their friends, been able to bloom out as full fledged architects, but it would be difficult to cite any such man, who having dispensed with the post graduate office course, has made a decided success as an architect, except at great pains to himself and a great loss of time. Architecture is so emphatically an objective art, and so dependent upon point of view for its expression, that it is too much to hope for complete preparation other than by the actual doing of the work.

It must not be assumed that because McKim, Mead & White have had so many and distinguished graduates, the younger practitioners have not an equal responsibility. The principles which make good architecture are not confined to large, expensive buildings, nor to elaborately organized groups of men. They are as old as the pyramids and as simple as a Greek vase. Some men will learn more in a small office. Some will need the stimulus of the keen competition in a large one, but in all offices there is opportunity for the architect to pay his debt to the world and to his profession. Nor is it a question of style, nor character of work, but it principally has to do with enthusiasm, point of view and absolute sincerity in what is done. The best hope of our profession in the future lies not in the schools but in the young men whom we are trying to train, and in the reflex action on us who are called upon to lead the way for them. So long as we welcome the young men, take them into our architectural life and show them how we ourselves would face definite problems, just so long will architecture with us continue to be virile and strong and free from mere affectation. We need the young men around us to keep fresh and vigorous. We need the constant stimulus to our own imagination which comes with trying to be honest with those who are trying to learn from us, and look at the problems as they are and not as some school tries to say they should be, so that while we owe a debt to the young men which we must repay in kind, we get far more than we give when we take them in with us and make them our helpers. The School in the broad sense is never the result of one man's work, but it is the collective sum of the aims which are shared by many minds approaching the subject from different angles and all reaching a harmonious output.

Just think for a moment how greatly the outlook of the architect is increased by the knowledge that he is responsible for the post graduate development of these young men. Doubtless all architects do not accept this point of view. Some drive their men as factory operators, some have no thought or care for anything except the money returns, many are selfish and unthoughtful of the charges committed to them, but in the main it is a fact that the architects of this country are interested in the young men far more than the young men appreciate at times. The architect who does not face this responsibility is generally without books, with few subscriptions to magazines, with little interest outside of his four walls, taking a slight part in civic affairs, not an all round man, but a narrow, restricted person who has gone into architecture because it was the means of making a living. But the architect who is really alive to his duties, encourages his young men to use his books, and he has all he can afford to buy of them and then some more. He is interested not only in the tasks that the office presents, but also in side issues such as competitions in the Architectural Club, and he should further, and I believe generally does, strive to encourage the young men on lines which have not wholly to do with the business of architecture:—to foster personal artistry, to encourage individual hobbies outside of the office, to incite to the aesthetic point of view. If a man shows a willingness for water colors, or for poetry, or for music, for old laces or delicate embroideries, for anything that is beautiful and uplifting, the architect, if he is wise, will do all he can to make his boys feel that that is a part of their own development and continuation of the culture which was begun in the architectural school.

Now these are not mere retrospective factors, they are the real substance of architectural practice, and without them a man gets out of touch with growth and progress, while with them, life is a constant joy and a constant opportunity to be of some real service in the world and to pass along the light to the coming generation. And this idealized co-operation between the practicing architect and his assistants means growth in architecture, for in his efforts to encourage the young men, the architect cannot but grow himself, and the mutual result will be far better because of the association. Sometimes we meet a peculiarly favored architect who seems to be able to do all his work and loves to have his hand and his personal imprint not merely upon an office, but upon everything that goes out from that office, and he consequently employs very few men, preferably wanting to do it all himself and feeling a moral obligation to be his own draughtsman. There are other men who feel that their chief function is directing a group of bright, earnest, eager men; that they are serving their clients and the profession best when they do very little real drawing, but gather around them the best of the rising generation and strive to make that generation better and to raise the whole standards for the generation to come. This last seems to have been the point of view of McKim—it is the point of view which always produces real architecture, whereas the individual type tends to hardness, selfishness and aesthetic construction. Architectural practice in America has been almost forced into the associational group plan because of the complexity of the problems which we have had to meet, but this very condition has turned out for the best and for the broad, hopeful development which we think American architecture represents today.

The obligations are not alone on the employer. The young men have a certain duty which is involved in their choice of where they will work. It is not enough merely to get a job. Each young man fresh from college should exercise a process of choice, throwing out of consideration the architects who are in business only for what they can make in it, throwing out the men whose equipment is deficient, throwing out the men whose personality does not lend itself to comradeship, and throwing out absolutely the architect who runs his office like a mill. If the young men instead of trying to find out what architects are busy and are likely to give them a job, would make the first requirement that they will try for the office where they feel they can grow, it would be a splendid thing for the profession and for the

(*Concluded on page* 217)

# ·EDITORIAL·COMMENT·

THE REVEREND DR. E. C. PEARCE, Vice-Chancellor of the University of Cambridge, while moving a vote of thanks to President Paul Waterhouse of the R. I. B. A. stated:

You may know that we have a lusty bantling at Cambridge University, the School of Architecture. We are trying to do what we can to give education in architecture, which I hope is not vocational. I am out against vocational education. I remember that, during the war, I was called upon to attend a Conference of Colonial and Home Universities, and in the course of the proceedings it fell to my lot to defend Home Universities against the attack which was being made upon them by our Colonial brethren. I need not say what the attack was, but the burden of my remarks was chiefly this: that Cambridge—and I suppose I can speak for Oxford too—is not a place where you go to lectures, and it is not a place where you profess to learn anything, least of all how to dodge examiners; but Cambridge is a place where you live for three years. And that, bluntly put, means that education there is not vocational, that the great education you derive is how to deal with your fellow man. I imagine that for an architectural school it is of the utmost importance not only to be able to build buildings, but to know how to deal with clients who order them. That is one of the things we are trying to teach.

Doctor Pearce might have as logically stressed the further necessity for knowing how to deal with contractors and all the many and intricate business elements that enter into modern architectural education.

* * *

OF ALL ARTISTS THE ARCHITECT alone is subject to the dominating rule of accuracy. His plans are dictated instructions in a common language understood alike by the creative artist and the skilled artizan. They must be drawn with mathematical exactness. His sense of artistic freedom, poetic license if this term is preferred, may have expression in his design yet here it is restrained by the necessity for holding to the lines of force existent within the frame of the structure. In this respect he is in like condition with the sculptor, and the artist who draws the living form, for the beauty of their work depends entirely upon their knowledge of anatomy and the ability to portray it.

The media employed by the architect in the creation of his vision are the pigments of the painter, the fabrics of the weaver and the spinner, the clay of the potter, the marble of the sculptor, the stones of the mason, the metals of the skilled smith; combined with the skill of the artist, the sympathetic understanding of the scholar and—last, but not least—unswerving obedience to laws expressed in the mathematical exactness of the formulas of applied science.

Not alone in the drawings must tendency to poetic license be curbed, but in the no less essential item, the specification, must the architect observe restraint. Specifications are fine examples of prose writing wherein ideas are expressed in the fewest number of words, in language comprehendible alike to client and artizan, for the purpose of keeping the cost within imposed limits while carrying out the ideas expressed in the drawings; but, the writer may not, like the man who writes good prose, indulge in flights of fancy nor deviate one hair's breadth from the straight and confined path leading directly to his goal. Accuracy, incisive statement, absence of all confusion of thought, all vagueness of expression, are outstanding in good specifications, as they are in well executed drawings of well designed and well planned structures.

In some respects specifications recently written for comment show weakness. The designers provided for certain utilities in the plans and left to the specification writer the task of so describing the items that, out of a number on the market, one would be selected and installed. Procrastination, that insidious fault and unpardonable sin, alone prevented the specification writer from producing work of a standard comparable to the work of the draftsman. The specification did not specify but left to future determination the type of fixture to be installed. Accuracy imposed upon and faithfully followed by the artist, as evidenced by restrained expression, was side-stepped by the one man who, least of all is supposed to be influenced by, or to have any cause to exercise, poetic license. A building is not complete until it is complete in every detail and this involves the determination of all debatable points at some time. The proper time is when the plans are under way and calm reflection is ruling, before contracts are let and hurry and bustle of construction begin. "My father," said an architect, "made me when a boy saw cord wood to keep the home fires burning. He insisted upon the largest and knottiest pieces being taken care of first, saying that by following this rule the work became easier and more agreeable with the passing weeks. Throughout my life his good sense has been demonstrated in my work, for my first decisions are always those most difficult to make and most alluring to leave until later. These decisions are made after careful consideration and are never changed. I have yet to hear people complain that I am arbitrary."

THE PRESENT BEWILDERMENT IN the construction industry is paralleled by similar conditions existing in other lines of industry, with the difference that the construction industry is slower in evolving a solution. The reason, as was so ably stated by Ernest T. Trigg, president of the National Association of Construction Industries in his recent address before the National Association of Builders Exchanges, is lack of co-operation and, indeed, lack of knowledge as to the kind and amount of co-operation needed.

The construction industry is composed of non-associated units of nomadic manufacturing plants. Each contractor is a peripatetic manufacturer, each contract a plant of limited output. The demand on each unit is uncertain and only by considering the industry as a whole will it be possible to accomplish the many things necessary to be accomplished if the construction industry is to function as other industries bid fair to be functioning as soon as winter is fairly over.

Mr. Trigg believes much of what was called co-operation in a period of rising prices may well be abandoned, at least so much as consisted in regulation of prices and limitation of output and competition. He believes that during a period of falling prices, such as the country seems to be facing, co-operation should be centered on the following few essentials;

Statistics of all kinds; a study of what they mean and how they properly may be utilized:

Transportation; an item that affects all industries but none so much as the construction industry in which materials actually entitled to a bulk rate as raw materials pay rates as manufactured materials:

Legislation; co-operation between contractors, construction labor, architects and engineers is necessary to keep the public from initiating legislation affecting the construction industry:

Finances; co-operation on this point must bring in the bankers as of equal importance with workmen and contractors in smoothing curves of statistics affecting construction, both as to costs and volume:

Standardization; co-operation here will cover training of artizans, shifting of dis-engaged labor from firm to firm and job to job, reducing crises due to unemployment, standardization of details of machines, sizes and quality of units of materials, etc.

Co-operation does not imply combination, the latter word covering, but not effectually hiding, a multitude of sins, but it means getting together in a right spirit earnestly to search for solutions of many wrongs that beset the industry. At present no real knowledge of them is had; suspicions only are in evidence.

**House at Chipping Camden, England**
*(From a Photograph by Robert M. Blackall)*

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(See page 223 for floor plans)

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(*See page 223 for floor plans*)

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*(See page 223 for floor plans)*

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ROOM IN BUILDING OF NEW YORK CHAMBER OF COMMERCE

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ROOMS IN BUILDING OF NEW YORK CHAMBER OF COMMERCE

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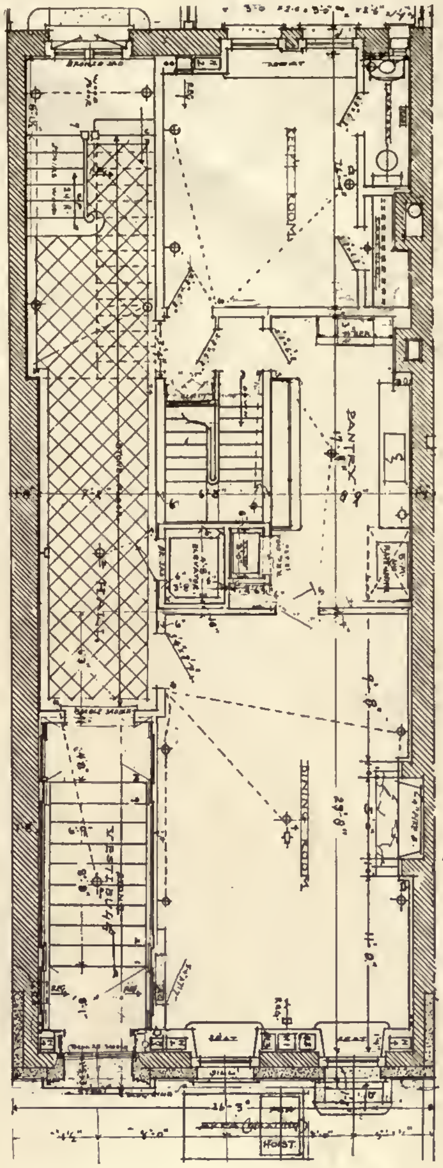


FIRST FLOOR

HOUSE OF
MATTHEW A. WILKS, ESQ.,
NO. 7 W. 81ST STREET,
NEW YORK

A. L. HARMON, ARCHITECT

(*For additional floor plans see page 222*)

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DETAIL OF MANTEL
HOUSE OF MATTHEW A. WILKS, ESQ., NO. 7 WEST 81ST STREET, NEW YORK
A. L. HARMON, ARCHITECT

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DETAIL OF MANTEL

HOUSE OF MATTHEW A. WILKS, ESQ., NO. 7 WEST 81ST STREET, NEW YORK

A. L. HARMON, ARCHITECT

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CENTRAL JEWISH INSTITUTE, EAST 85TH STREET, NEW YORK

BENJAMIN W. LEVITAN, ARCHITECT

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DETAIL OF PRINCIPAL ENTRANCE

CENTRAL JEWISH INSTITUTE, EAST 85TH STREET, NEW YORK

BENJAMIN W. LEVITAN, ARCHITECT

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HOUSE OF W. D. PACKARD, ESQ., CHAUTAUQUA, N. Y.
WARREN & WETMORE, ARCHITECTS

216"

EXTERIOR DETAIL
HOUSE OF W. D. PACKARD, ESQ., CHAUTAUQUA, N. Y.
WARREN & WETMORE, ARCHITECTS

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HOUSE OF FREDERICK SUTHERLAND, ESQ., RIVERDALE, N. Y.

CLARENCE W. BRAZER, ARCHITECT

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HOUSE OF FREDERICK SUTHERLAND, ESQ., RIVERDALE, N. Y.

CLARENCE W. BRAZER, ARCHITECT

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ENTRANCE DETAIL, HOUSE OF REGINALD E. MARSH, ESQ., BRONXVILLE, N. Y.
TOOKER AND MARSH, ARCHITECTS

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ENTRANCE DETAIL OF A HOUSE AT BRONXVILLE, N. Y.
TOOKER AND MARSH, ARCHITECTS

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### Architectural Education

(*Continued from page* 214)

young men, and would go a long way towards hastening the probational period, which we must all go through. The office is the inevitable and logical successor to the school. It is the focus from which inspiration starts and spreads. The young men on their part must choose wisely, and the architects on theirs must give freely and intelligently.

And given a right kind of training in the schools so the young man as he comes to the architect is able to fit at once into this elaborate machine; and given the young man's desire and intention to be something in his profession; and given further the willingness of the architect himself to take the young man into his architectural heart and life—with these three conditions, the future of architectural education can offer nothing but a most brilliant promise for the country.

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### A Communication from Cass Gilbert*

The Editors, The American Architect.

I HAVE only recently received a printed circular entitled "Report by an Investigating Committee of Architects and Engineers on Quantity Surveys as furnished by the Quantity Survey Company, Inc.," in which is reproduced the report and recommendations of a joint committee representing the American Institute of Architects, American Engineering Council of the Federated Engineering Societies, and Associated General Contractors of America.

I would like to point out that whatever the merits or demerits of the Quantity Survey System may be, that if it is put in operation the Owner will expect the Architect to pay for the survey. The Institute Schedule of Practice and Charges for many years has assumed that the Owner would pay for the services of engineers and various experts, traveling expenses, additional compensation when absent on trips, an increase above the minimum of six per cent for special interior decoration, furniture, etc., and for buildings of greater elaboration and in many cases such agreements are made by the Owner, but in the present tendency of practice it is increasingly difficult to make agreements with Owners, especially committees and public bodies, to this end.

The Architect is constantly asked to include in his minimum charge of six per cent, the cost of special experts for mechanical, sanitary and electrical equipment and other special items. The minimum fee of six per cent is consequently looked upon as the maximum fee upon which basis he is sometimes asked to divide his fee with a local associate as in the case of the recent Richmond Memorial Building, and to concede traveling expenses and salary of the clerk of the work or local superintendent, also cost of duplicating blueprints for estimating purposes and it is with the greatest difficulty that clients can be brought to see that all of such items are legitimate and proper charges.

Frankness with ourselves compels us to recognize that many of the most eminent and distinguished architects as well as many of the lesser architects in the country make concessions on these points in a spirit of competition for business which is foreign to the professional ethics so much to be desired.

If the Quantity Survey System is adopted it is inevitable that the Client will say in substance "Mr. Architect didn't you agree to perform all of the professional services necessary for this operation, if so, is not an estimate of the cost necessary to inform yourself if not me, how far this operation can go within the appropriation I have named and if this is so why should not you furnish me with the best available estimate,"—or the Committee will say "Mr. Architect, this is a State Capitol Building which will cost $7,000,000.00, your fee on this work at six per cent is $420,000.00, you can well afford to include this little item of Quantity Survey and absorb it within your fee; Messrs. Blank and Blank have tentatively agreed to do so if they are appointed and there is nothing in your Institute Schedule of Charges to forbid you doing it. Take the minimum amount of one-quarter of one per cent—it will only be $17,000.00," and thus step by step another tax, not only of money but of responsibility, is laid upon the already burdened profession of Architecture. I am aware that it is not proposed that the architects shall pay for the Quantity Survey, not now, but they will—later on.

The Quantity Survey has not proved to be a success in England. It has tended to lessen rather than to increase the architect's standing in relation to his work, however convenient it may be for the builder and however helpful for the Owner. I believe that it has been a cause of controversy and litigation more often than a means of adjustment and if it is adopted in this country the architects will, in my opinion, pay for it. If the Owners or builders want the Quantity Survey let them promote it and pay for it.

The architects just now seem rather in the mood to try experiments on themselves. We have had a rather extended experiment in licensing architects, for instance, which still seems to be a fashion, or an epidemic, which has resulted in laying quite a heavy monetary tax for license fees upon the architects without bettering anything so far as visible.

I hope that the architects will go very slow about making this experiment.

CASS GILBERT.

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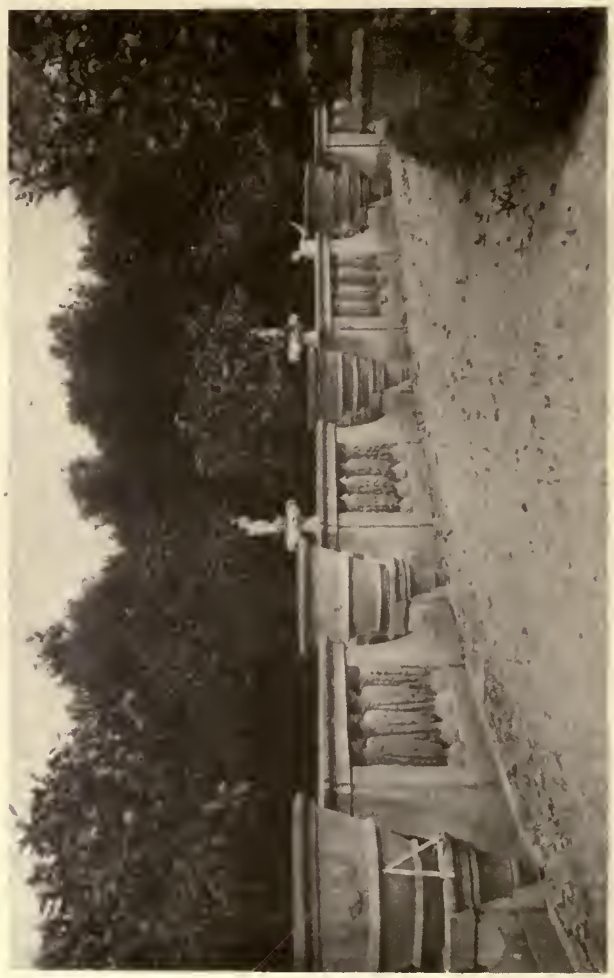
**Editorial Note. The main question involved in the above communication is the determination of the real character of the service architects should render to their clients. As to who should pay the charges for a quantity survey, the client or the architect, is, we believe, entirely outside of the present discussion.*

*Are the safeguards which a quantity survey affords, an advantage to the client? Does the accuracy of a quantity survey make it possible for architects to render better service?*

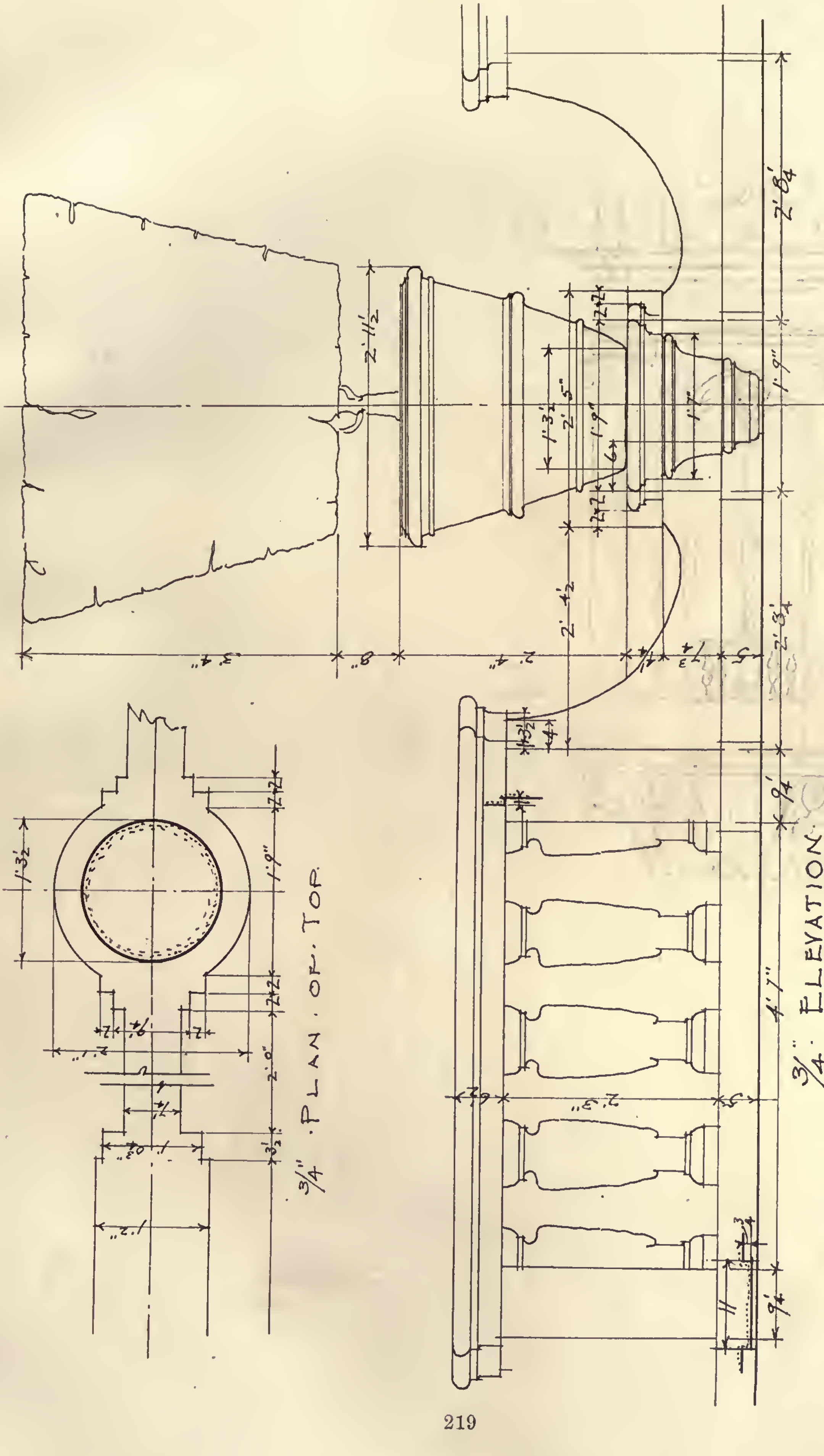
*It would seem that any architect who has a demonstrated ability for competency, need have no fear in suggesting to his client the many safeguards which a quantity survey affords, or insisting that the client should bear the expense of a comparatively small charge which so thoroughly guarantees the best construction of his building, at the least cost consistent with its character and the existing conditions.*

BALUSTRADE, BOBOLI GARDENS
SIENA, ITALY

*THE AMERICAN ARCHITECT, SERIES II.*
*FRENCH AND ITALIAN DETAILS*

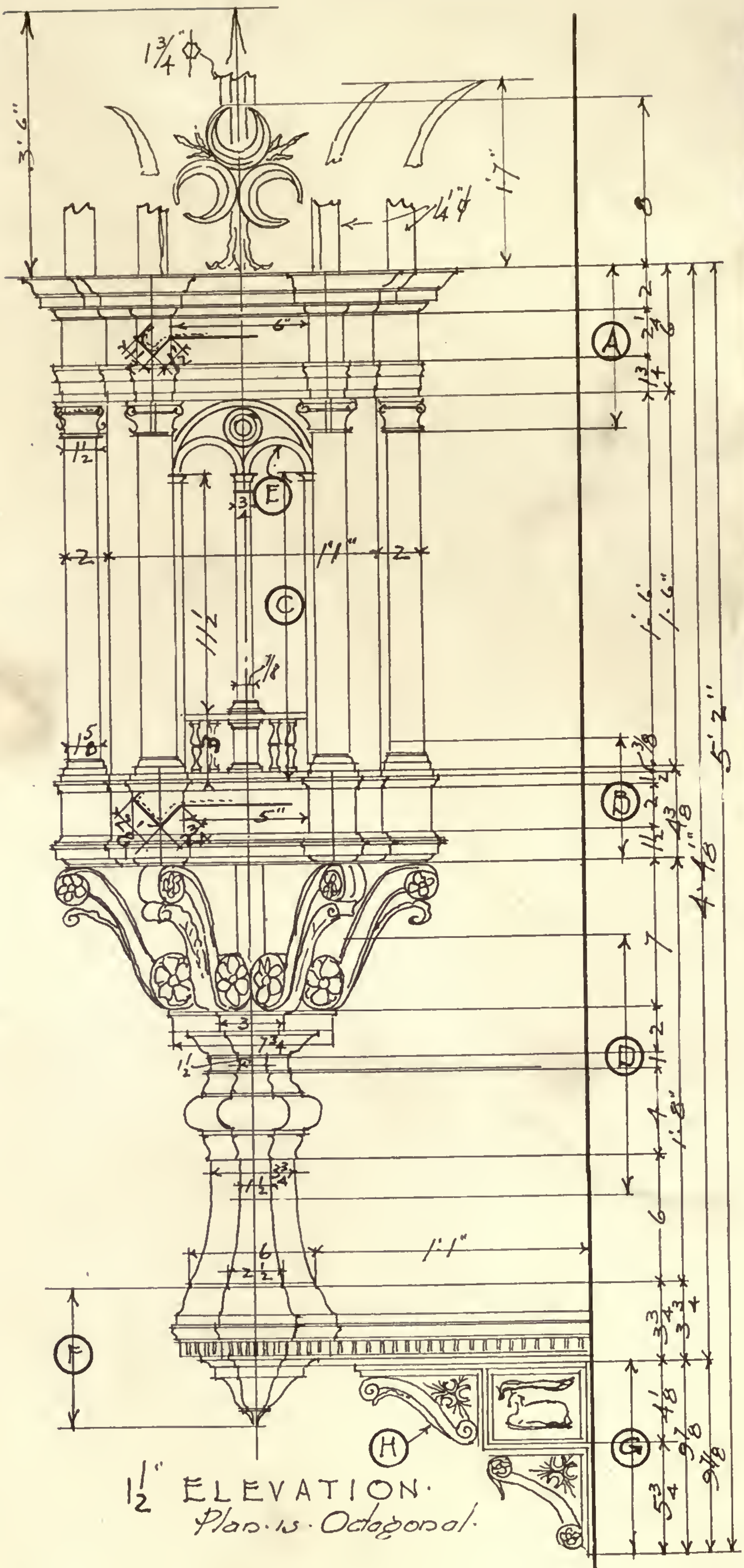


MEASURED AND DRAWN BY ROBERT M. BLACKALL




BALUSTRADE IN BOBOLI GARDENS, SIENA, ITALY

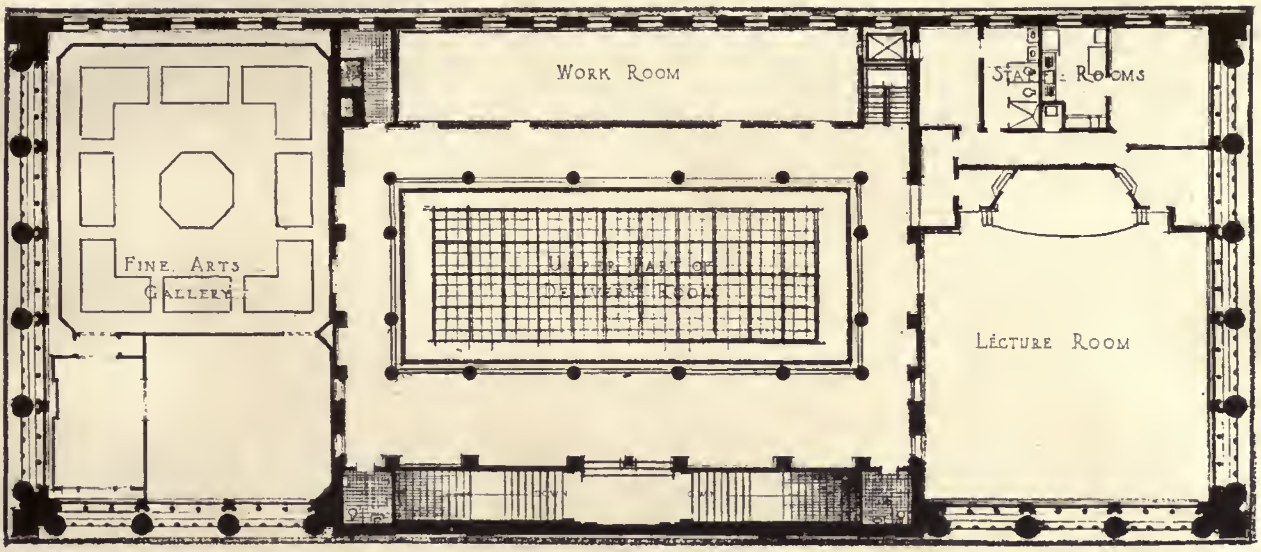
MEASURED AND DRAWN BY ROBERT M. BLACKALL

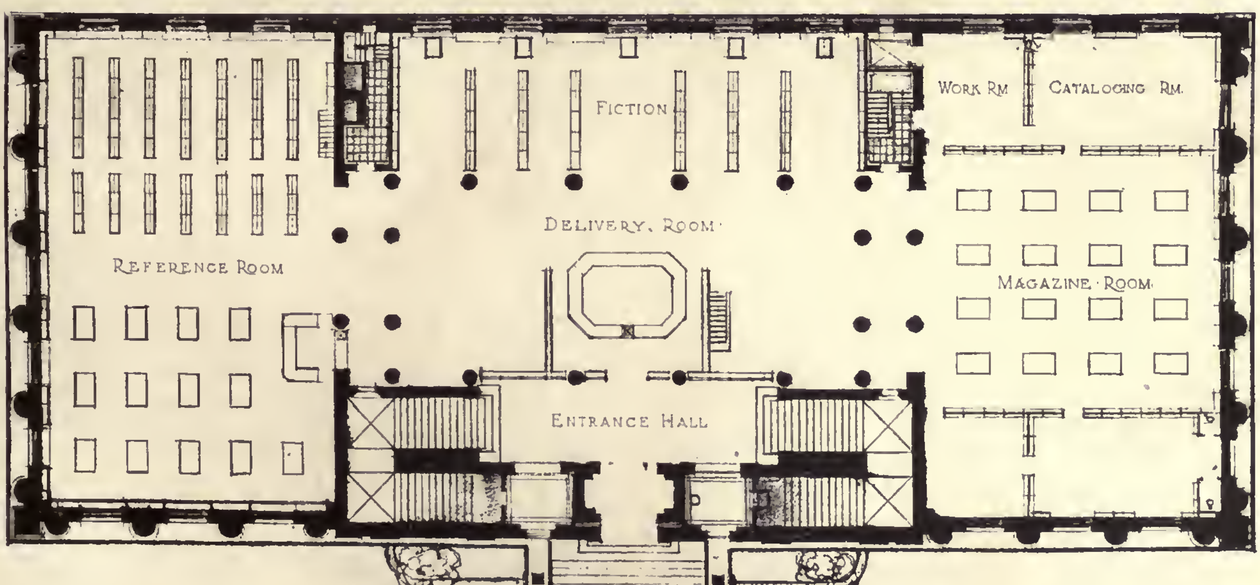



IRON LANTERN, STROZZI PALACE, FLORENCE, ITALY

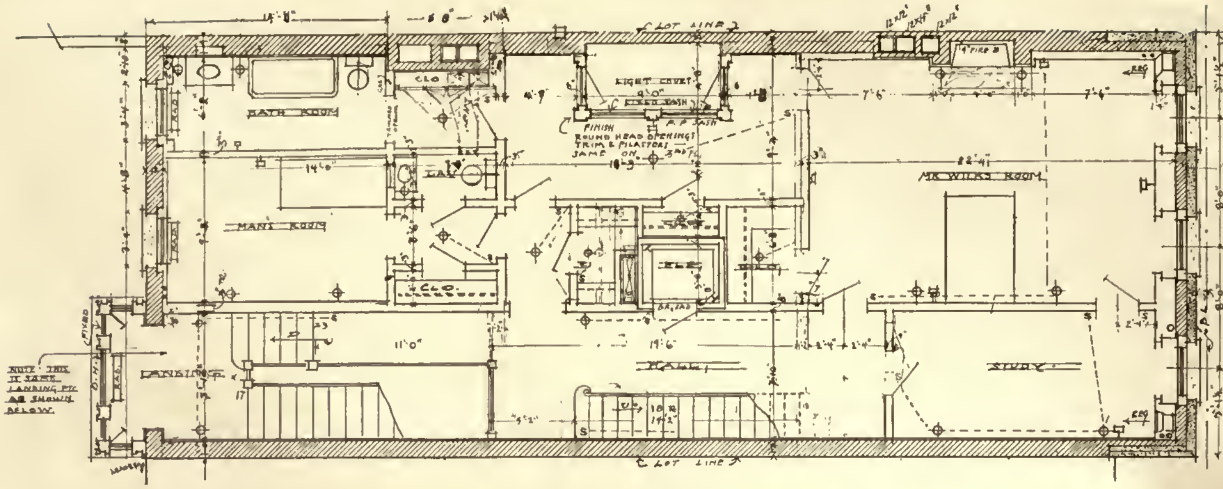
MEASURED AND DRAWN BY ROBERT M. BLACKALL

*THE AMERICAN ARCHITECT, SERIES II. FRENCH AND ITALIAN DETAILS*

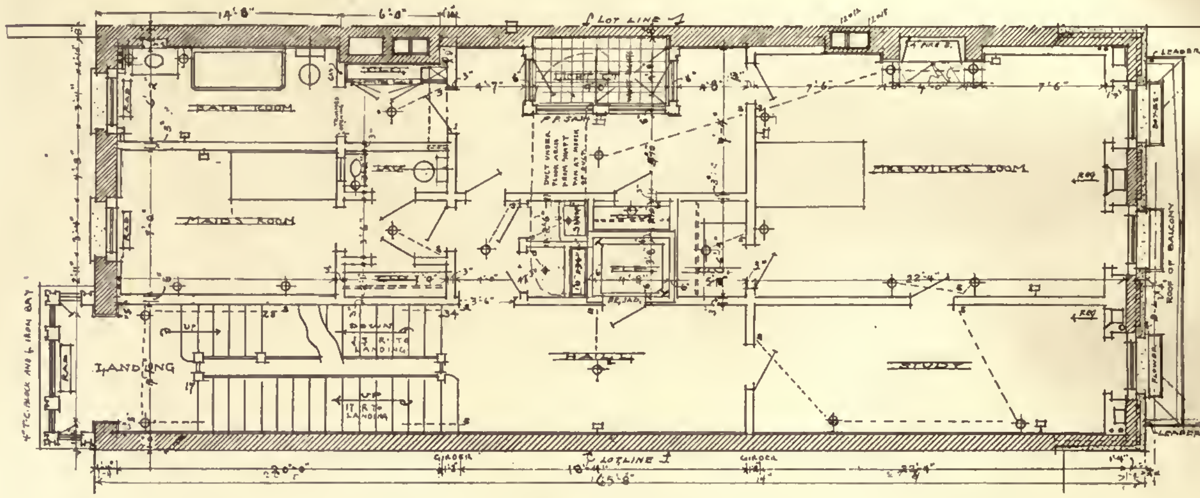



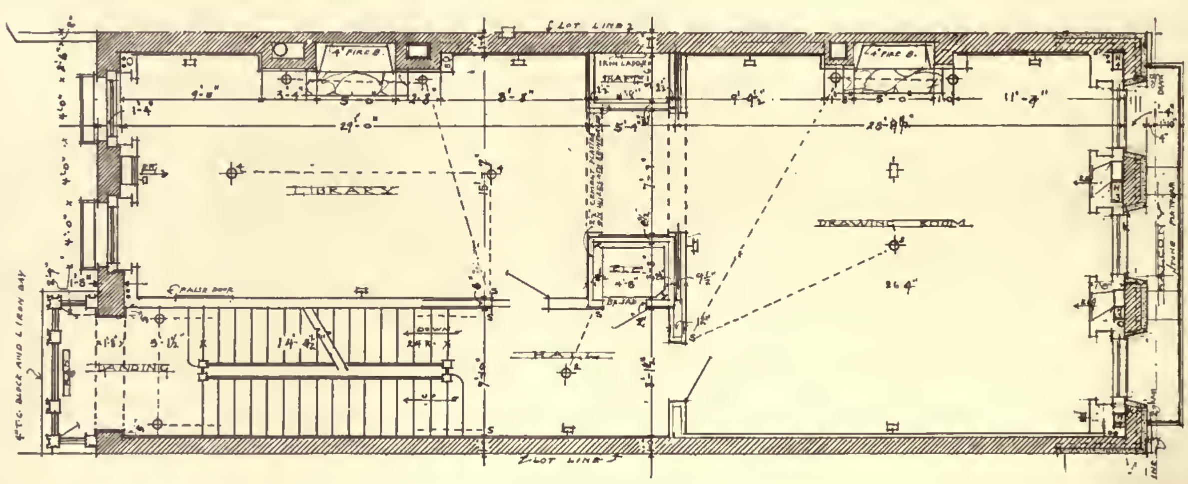

THE WILMINGTON INSTITUTE FREE LIBRARY, WILMINGTON, DEL.
EDWARD L. TILTON AND ALFRED M. GITHENS, ASSOCIATED ARCHITECTS




FOURTH FLOOR




THIRD FLOOR



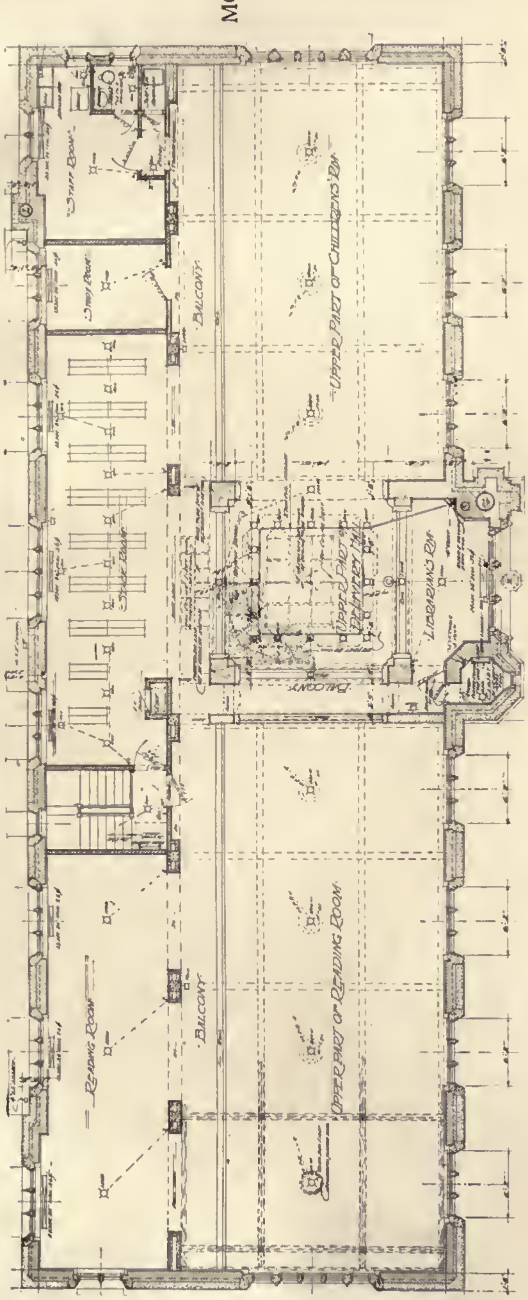

SECOND FLOOR

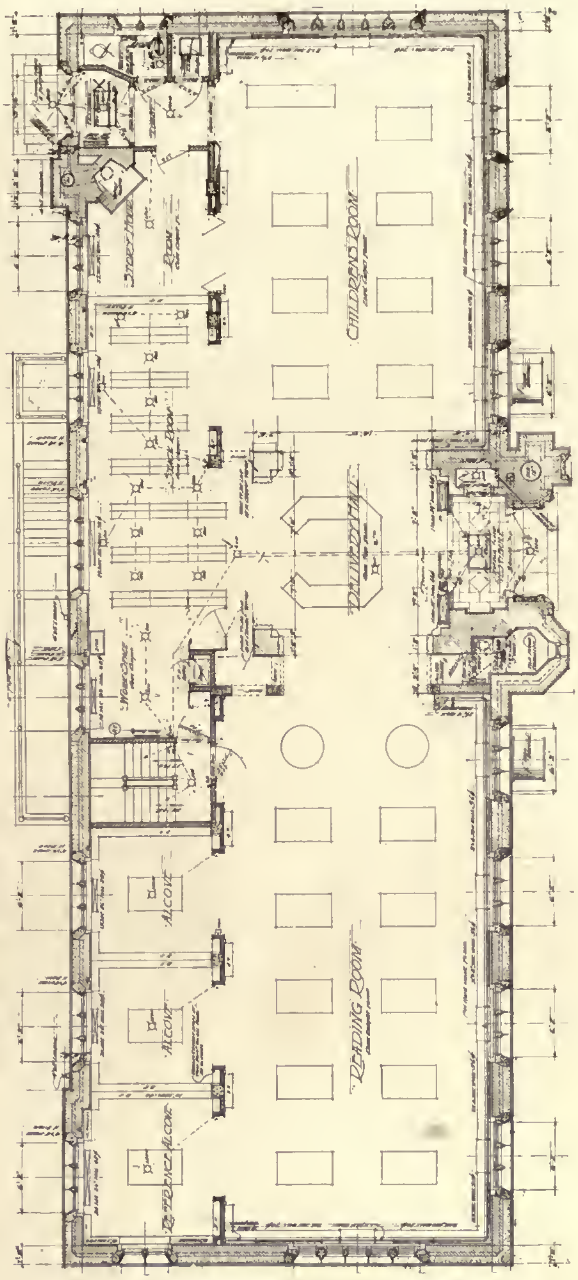
HOUSE OF MATTHEW A. WILKS, ESQ., NO. 7 WEST 81ST STREET, NEW YORK

A. L. HARMON, ARCHITECT

*(For exterior view and first floor plan, see plate section)*

MORRISTOWN FREE LIBRARY,
MORRISTOWN, N. J.





EDW. L. TILTON,
ARCHITECT

*(For exterior and interior views see plate section)*

# BEAUX-ARTS INSTITUTE OF DESIGN

Director of the Institute, LLOYD WARREN

Architecture, RAYMOND M. HOOD Sculpture, JOHN GREGORY
Interior Decoration, ERNEST F. TYLER Mural Painting, ERNEST C. PEIXOTTO

Official Notification of Awards—
Judgment of Oct. 4th, 1921

PROGRAM

CLASS "B"—VI ANALYTIQUE

The Committee on Architecture proposes as subject of this Competition:

"A STONE FIREPLACE"

The chief motif of decoration of the lounging room in a city club is a fireplace which is placed in the center of one of the end walls. The room itself is built of stone and it is desired that in the composition of the fireplace motif, columns and the simple forms of classic architecture shall play an important part. The fireplace itself is to be built of stone, although marble may be used in conjunction with it for contrasts of color and texture.

Fireplaces and decorative motifs of this character were common, particularly in the style of Henry II in France, as may be seen in the ball room of the Palace at Fontainbleau and in many tombs, as in the Cathedral of Saint Denis, where the classic forms were combined in a similar way. Freedom was obtained by the use and application of ornament. It is not intended in this case, however, that the student shall confine himself to the period of Henry II, but that he shall draw his inspiration from any one of the classic styles he desires.

*Jury of Award:*—R. M. Hood, L. Warren, H. R. Sedgwick, W. F. Lamb, H. O. Milliken, J. M. Howells, J. O. Post, J. C. Levi, A. D. Seymour, Jr., O. Faelton, H. W. Corbett and T. S. Holden.

This Jury also served as Jury of Awards for: Class "B"—VI Projet, Class "A"—VI Projet, Class "A" and "B" Archaeology—VI Projet and Archaeology—VI Measured Drawings.

*Number of Drawings Submitted:*—12.

AWARDS:—

FIRST MENTION:—Dell Jansen and A. E. Shrimpton, John Huntington Poly. Inst., Cleveland.

MENTION:—C. M. Woodward, George Washington Univ.; Y. Machacek and L. H. Schofield, John Huntington Poly. Inst., Cleveland; W. Hibbs, Atelier Norfolk; E. Norling and E. J. Leveque, Atelier Parsons-Chicago Archtl. Club.

PROGRAM

CLASS "B"—VI PROJET

The Committee on Architecture proposes as subject of this Competition:

"A SCULPTOR'S STUDIO"

A sculptor who owns a large farm in the country intends to build himself a studio where he can work undisturbed and under ideal conditions. He has selected as the site a little knoll, which looks down through the trees to a rushing stream below, and here, without in any way sacrificing the practical requirements of a studio it is possible to develop the picturesque and attractive building that he desires.

The studio will consist principally of the single large room in which he works. This should have ample height and space for the execution of important work, and one of the chief requirements in this particular is that a raised platform or balcony shall be arranged on which he can model his work at a height from the floor that approximates its ultimate setting. Taking advantage even of the slope of the ground the sculptor would like to have an arrangement made, by which he will be able to move big pieces of work out of doors occasionally, where they can be studied and viewed in the sunlight. There is to be no heating plant in the studio. (for he does not intend to use it during the winter months) so he wishes to have an immense fireplace which, ornamented with some of his own sculpture will form an attractive architectural motif for the large studio, and heat the interior on chilly days. The lighting as in every studio should be ample, coming principally from the north, although other windows should be arranged not only to take advantage of the views out-of-doors but to make it possible to get a variety of lighting on his work.

In addition to the studio itself there should be a small kitchen where meals can be prepared and another small room which can serve as a dining room, a reception room, or even a bedroom at need, as from time to time the


R. B. Thomas — Yale University

3d Medal

Class "A" and "B" Archaeology—VI. Projet—A Colonial Staircase

Dell Jansen

John Huntington Polytechnic Institute

1st MENTION

Class "B"—VI. Analytique—A Stone Fireplace

F. H. Floyd

Carnegie Institute of Technology

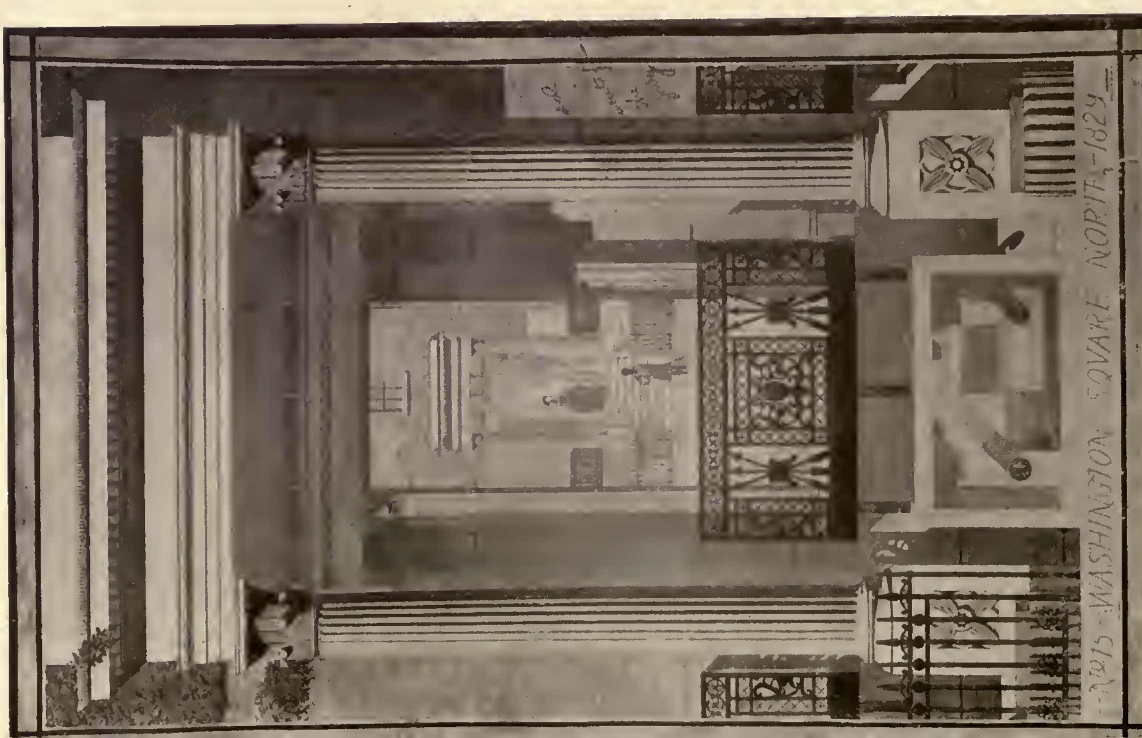
1st MENTION PLACED

Class "B"—VI. Projet—A Sculptor's Studio

STUDENT WORK—BEAUX-ARTS INSTITUTE OF DESIGN

## BEAUX-ARTS INSTITUTE OF DESIGN

## STUDENT WORK



F. Price — Atelier Wynkoop

3d MEDAL

Class "A" and "B"—Archaeology—Measured Drawing

M. Rombotis — Los Angeles Architectural Club

2d MEDAL

Class "A"—VI. Projet—An Hotel Establishment sculptor will wish to spend a few days continuously in the studio. Opening off the studio should be a work shop which need not exceed 750 sq. ft. in area. Here will be done the preparatory work, such as building armatures, mixing clay, and the plaster casting and the miscellaneous carpentry work which is necessary in a sculptor's studio.

The usual toilet arrangements shall be provided for the sculptor and the four or five assistants that he ordinarily employs. A store-room of approximately 750 sq. ft. area shall be provided which, if desired, can be placed in a natural basement formed by the sloping hillside.

The entire building shall not exceed 125'-0" in any dimension, and as a safeguard against fire, the sculptor wishes to build the walls of masonry, using either brick or a local stone of the vicinity.

*Number of Drawings Submitted:—14.*

AWARDS:—

FIRST MENTION PLACED:—F. H. Floyd, Carnegie Inst. of Tech.

FIRST MENTION:—W. M. Burke, Carnegie Inst. of Tech.; V. B. McClurg, Los Angeles Archtl. Club.

MENTION:—I. Tron, J. M. Paul and P. Simonsen, Columbia Univ.; F. B. Smith, Carnegie Inst. of Tech; F. Sakata, John Huntington Poly. Inst., Cleveland; R. E. Dando, Atelier Parsons-Chicago Archtl. Club; A. F. Harrer, Atelier Wynkoop, N. Y. C.

PROGRAM

CLASS "A"—VI PROJET

The Committee on Architecture proposes as subject of this Competition:

"AN HOTEL ESTABLISHMENT"

An hotel establishment is to be built on a small island of irregular outline lying a short distance from the mainland. The island in plan is roughly comprised within a rectangle that measures 900'-0" by 600'-0". The architect who is to construct this hotel has been given the greatest freedom in the disposition in the units of the group, and the landscape treatment.

The following are the requirements that are given to him:

THE HOTEL:—This shall provide for 100 bedrooms with the usual requirements on a main floor such as the office, a large restaurant, a small grille, reception rooms, writing rooms, and a ball room. Porches or shaded terraces shall form a part of the composition.

SERVICES:—The services shall be arranged in a semi-detached building or buildings, and shall include the kitchens, scullery, laundry, servants' dining rooms, and sleeping quarters.

THE GROUNDS:—These shall be arranged to include a bathing beach, tennis courts, croquet lawns, and formal gardens. A small harbor, landing place and boat houses shall be arranged for boats and launches, which are the only means of connection with the mainland. The service courts shall be carefully screened so that they are not objectionable to the hotel guests.

*Number of Drawings Submitted:—5.*

AWARDS:—

SECOND MEDAL:—L. Rombotis, Los Angeles Archtl. Club, Los Angeles.

MENTION:—I. J. Loebl, Chicago Sch. of Archt.; J. Pendlebury, 2509 Ave. "D", B'klyn, N. Y.; A. H. Goddard, Atelier Wynkoop, N. Y. C.

PROGRAM

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

The Committee on Architecture proposes as subject of this Competition:

A COLONIAL STAIRCASE.

The staircase was one of the elements of the colonial house, on which the carpenter architects of the period devoted their greatest efforts and skill. Occurring in the central hall of the house, it usually started on the side wall, returning on itself with right angled turns. In the large mansions, where the ceiling height was great, the development of the landing at the turn made it the motif of chief interest in the staircase hallway. Invariably the one large window of the house, usually of Palladian design, was placed here flooding the staircase and hall with light, and the landing was usually made of sufficient size to accommodate the musicians at the times of entertaining. In the south even, this feature was often arranged as a separate balcony opening off the landing.

The stairs were built as a rule with open strings, and a great deal of ingenuity was displayed in the elaboration of the exposed ends of the steps. Newel posts occurred at the turnings, the one at the start of the stairs being frequently developed into an attractive form by turning the stair rail in a spiral about it. The exposed soffits of the stairs were either plain plastered or wood panelled surfaces. The side walls were variously treated with panelled wainscoting and the attractive wall papers of the period.

The staircase that is the subject of this problem runs from the first to the second story of the large mansion. The hall in which it occurs is 14'-0" wide, and the height from the first floor level to the second floor level is 13'-0".

*Number of Drawings Submitted:—7.*

AWARDS:—

THIRD MEDAL:—L. H. Schofield, John Huntington Poly. Inst., Cleveland; F. M. Garey, Richmond Archtl. Club; R. B. Thomas, Yale Univ.

*Number of Drawings Submitted:—5.*

MENTION:—E. W. Niblet, Richmond Archtl. Club.

SUBJECT:—

Colonial Doorway at No. 15 Wash. Square, North, N. Y. C., about 1829.

AWARD:—

THIRD MEDAL:—T. F. Price, Atelier Wynkoop, N. Y. C.

SUBJECT:—

Pulpit—St. Peter's Church, Philadelphia.

AWARD:—

THIRD MEDAL:—A. E. Westover, Jr., "T" Square Club, Philadelphia.

SUBJECT:—

The Root House, Skaneateles, N. Y.

AWARD:—

Mention:—E. R. DeShaw, Syracuse Univ.

SUBJECT:—

The Gate Lodge of the Longstreet Castle, Syracuse, N. Y.

AWARD:—

MENTION:—C. H. Siebert, Syracuse Univ.

# DEPARTMENT OF SPECIFICATIONS

IN previous issues this department has discussed specifications for foundation work and has presented suggestions respecting the compilation of outlines for foundation specifications.

We will now take up the consideration of specifications for structural plain and reinforced concrete work, and other miscellaneous concrete items encountered in and about building construction, even though they are not strictly a part of the structural work. This will presuppose the erection of a building of a number of stories in which there are present reinforced concrete columns, beams, girders, trusses, floor and roof slabs, walls, machinery foundations, the numerous items of plain concrete together with material for and the erection of forms, reinforcing media, the mixing and placing of concrete, and other correlated items.

In order that the reader of the specification may know what to expect in the way of building construction work when he starts to analyze the drawings (this is especially true in the case of the estimator), one must assume that the specification will be a specific description of certain factors and elements that cannot be placed on the drawings or that properly should not be presented in the form of notes elsewhere than in the specifications.

For this reason specifications for structural concrete work should commence with a brief description of the various component parts and the list of structural drawings and accompanying architectural drawings that must be consulted. Further with respect to this list of drawings, it is possible that it will be necessary, or at least advisable, to include the mechanical and electrical equipment drawings so that inserts or anchorages may be anticipated or provided for in some manner, and so that if these items are not furnished to the contractor, he will know that they are required and will endeavor to hold up the pouring of concrete in one location or another until he has been assured that all items that are to be embedded in his work have been positioned correctly.

If there is any structural steel to be furnished and placed by the concrete contractor or is to be furnished and installed by others, or furnished by others and installed by the concrete contractor,—similarly if there are miscellaneous concrete items such as small engine and pump foundations that are to be furnished by other contractors,—these items must be explained fully so that the contractor will understand exactly what is to be included and also have a clear understanding of what is to be excluded. The specification writer must remember that if things are not excluded they are presumed to be included, especially where the phrase "all other concrete work" is used. That is to say, the attitude of the specification writer may be this but if there is a somewhat detailed description of the things to be included in the scope of the contractor's work, but in the body of the specifications no further specific mention is made of one or two items, the contractor may not understand fully and make inquiries which are useless.

In the proper order of sequence specifications for concrete structural work should be divided somewhat as follows:

Testing of Materials
Forms
Reinforcing
Mixing of Concrete
Placing of Concrete
Removal of Forms
Protection of Green Concrete
Finish of Concrete

with paragraphs interposed relating to the various miscellaneous items that are to be considered.

In the first place one cannot be too particular in knowing the quality of cement aggregates and water that are to be used for concrete work. In many cases the specification writer assumes that materials will be furnished of fairly good quality but he must not forget that it is possible the concrete engineer has based his calculations on a mix of concrete that will produce certain strengths. It would, of course, be ridiculous to have the design carefully studied and then to have the extremely fine work of calculation discarded through ineffective specifications. It is not deemed necessary at the present time to enter any further into reasons for tests of cement and aggregates; these reasons are too well known. It is well, however, to remind the persons writing specifications for a small structure, such as a residence or small store building, that even though the operation seems to be small and does not merit a great deal of attention a knowledge of the good and bad qualities of cement and aggregates should be in the possession of the specification writer.

Let us agree, then, that there must be certain standards of excellence laid down for the cement and other aggregates. It is customary for architects to specify that cement shall conform to the latest standard specifications for cement of the American Society for Testing Materials. Later, when the American Engineering Standards Committee is more fully established in the minds of all those having to do with building construction work, it is possible that their American Engineering Standards will be specified in a similar manner. Incidentally it would be of benefit to all readers of these columns to become acquainted with the activities of the American Engineering Standards Committee.

As to the qualities of the aggregates, it is rather hard to lay down rules, especially in view of the fact that many of the words indicating quality in common use today cannot be defined with any great amount of accuracy; for instance, with sand it may be all right to say that sand shall be "sharp" but this adjective really does not mean very much. Again, with respect to the coarse aggregates it is common to say that the material should be "hard, homogenous," etc., but while the meaning they convey to the average person is generally accepted as common requirements for coarse aggregates of good quality, when one attempts to analyze these words the looseness of any possible definition will be seen.

As a general rule, both with the fine aggregates and the coarse aggregates, it is desirable to obtain as much surface on one piece of sand or one piece of coarse aggregate that is possible. The specifications frequently reject round or rounded particles. Specifications further will reject long flat particles in coarse aggregate. Sizes of both aggregates should be specified, making sure that the minimum and maximum sizes are given where a spread is necessary. Aggregates generally should be graded from fine to coarse and it is customary so to express in the specifications these desirable qualities of large and small particles.

Aggregates must, of course, be clean and preferably should be washed. If it is local custom to indicate the size of aggregates by sieve numbers or by certain arbitrary numbers that trade usage has established, such defining terms should be used. A No. 4 aggregate in one locality might be a No. 3 aggregate in another locality and if the specification writer is not familiar with the local definitions it would be safer for him to specify by sizes in inches and fractions thereof for coarse aggregates and by sieve sizes for fine aggregates, making sure that sieve numbers are established standards such as those of the American Society for Testing Materials. If there is a question about the quality of sand, the specifications should require tests for the cleanness of the sand, these tests being made by very simple methods.

The water, of course, should be free from foreign substances or chemicals that might be dangerous to the cement or that might tend to discolor the finished work if discoloration is not desirable. A number of authorities on concrete mixing water have agreed that if water is potable it is generally good for concrete use.

The specification writer must exercise his own good judgment with respect to the length that he will go in specifying qualities of aggregates. For large reinforced concrete structures it is quite essential that qualities be very thoroughly established, especially if testing laboratory engineers are to be employed on the work. For smaller operations such rigid requirements will not be necessary.

Recently it has become customary to mix hydrated lime in the concrete and if this will be acceptable to the specification writer he should call for hydrated lime manufactured in accordance with the latest standard specifications for high magnesian lime of the American Society for Testing Materials. The concensus seems to indicate that high magnesian lime is to be preferred, although the specification writer should determine this question for himself, to some degree, by investigating the available kinds of lime.

If an integral dampproofing or waterproofing compound is to be mixed into the concrete it should be specified in the section devoted to qualities of materials. This section, of Qualities of Materials, should present requirements covering the kinds of forms, of reinforcing and of other miscellaneous items that the concrete contractor may be required to furnish. Although stated heretofore, it may be well to repeat here the belief that at the beginning of the specification there should be a section devoted to qualities of all materials so that the reader will know that all materials are specified in one part and that he will not be forced to search through all paragraphs to discover the quality of one of the materials.

It is just as necessary in structural concrete framing to employ the services of a surveyor in establishing lines and levels, as it is in foundation work. The specifications should include this detail so that there will be no question as to the responsibility for correct lines and levels, especially where they have been very carefully placed on the drawings with all figures made from certain bench marks.

The erection of forms is of great importance in all structural concrete work. Too much attention cannot be given to the fabrication and erection of the forms to the end that they may be stripped easily and without causing damage to green concrete. The specification writer does not have a great amount of latitude in the selection of the contours of forms since all profiles are established by the engineer. If what is known as "pan" construction is to be employed with beams about twenty-four inches on centers and a thin reinforced slab perhaps three inches thick over the beams, either wood or any of a number of patented metal forms may be used. For other floor slab construction either metal or wood forms may be used, although the use of metal in such cases has not been developed to a great extent. Forms for columns also may be either of metal or of wood according to the section of the column, its size, or whether it has a conical head or not, and other desiderati which have to do with the selection of the form best adapted to the work.

The forms must be adaptable to the work and should be of such kind that those things that must be built into the concrete when it is poured may be placed without difficulty. This means that if metal forms are to be used and built-in items are to hang from the concrete such as suspension wires for hung ceilings, the forms must admit the introduction of these wires without interference with their proper stripping. Strictures with respect to the kinds of forms should not be too great, especially where the concrete design has been carefully studied, as the contractor will be required to provide forms of the proper kinds and he should be allowed some latitude in the selection of materials. However, the forms in all cases should be erected substantially and so that after their position once has been fixed, they will not be disturbed during the placing of concrete or until the time of their removal.

Shores under beams and girders must be placed so that the forms for the sides of these members may be removed with the slab forms, leaving the soffits of beams and girders supported until it is safe to permit their removal. Forms should not be removed for at least seven days after the pouring of concrete. At this time slab forms may be removed, together with the sides of beams and girders. The supports under beams and girders should be kept in place some days longer; the exact minimum time should be determined in the specification with the further requirement that before any forms are removed the person in charge of the construction work must give his consent for such removal.

Although a number of years ago it was quite common to have concrete fail because of the early removal of forms, it is not believed that contractors are quite as careless now, nevertheless, each operation should be considered to be full of danger unless certain requirements that are standard all over the country, are complied with. The temperature at the time the concrete is poured and during the time it is being supported by forms also must be taken into consideration. The permissible minimum time for the removal of forms must be lengthened considerably according to the weather. The established minima, however, never should be changed as it is presumed that they have been established only because of certain well known facts peculiar to the work.

The column forms should be kept in place for at least two weeks. In all cases where there may be pressure on green concrete such as sidewalk beams that are formed into a retaining wall at the curb, and exterior columns in the building, or where the basement walls are retaining walls as well as foundation walls, it is always advisable to require that forms be left in place until concrete has dried out thoroughly so as to obviate any difficulty arising from external forces acting on the structural form work.

It is well to mention here one precautionary measure that should be mentioned in all operations no matter what the size of the building may be. It is this. The form work must be designed with a certain amount of engineering skill, not only for reasons of economy but for reasons of strength and of substantiality. In connection with this precaution the shores should be placed on firm ground and should be well footed in place. It may seem unnecessary to say that shores never should be placed on frozen ground unless it is known that the ground will remain frozen during the time the shores are in place. Strict accuracy requires that it be said such assurance is almost impossible to obtain from anyone, and therefore it is advisable to require that where shores are placed on soil during freezing weather, they should extend down to a depth sufficiently beyond a possible frost line to preclude damage from settlement during thawing periods.

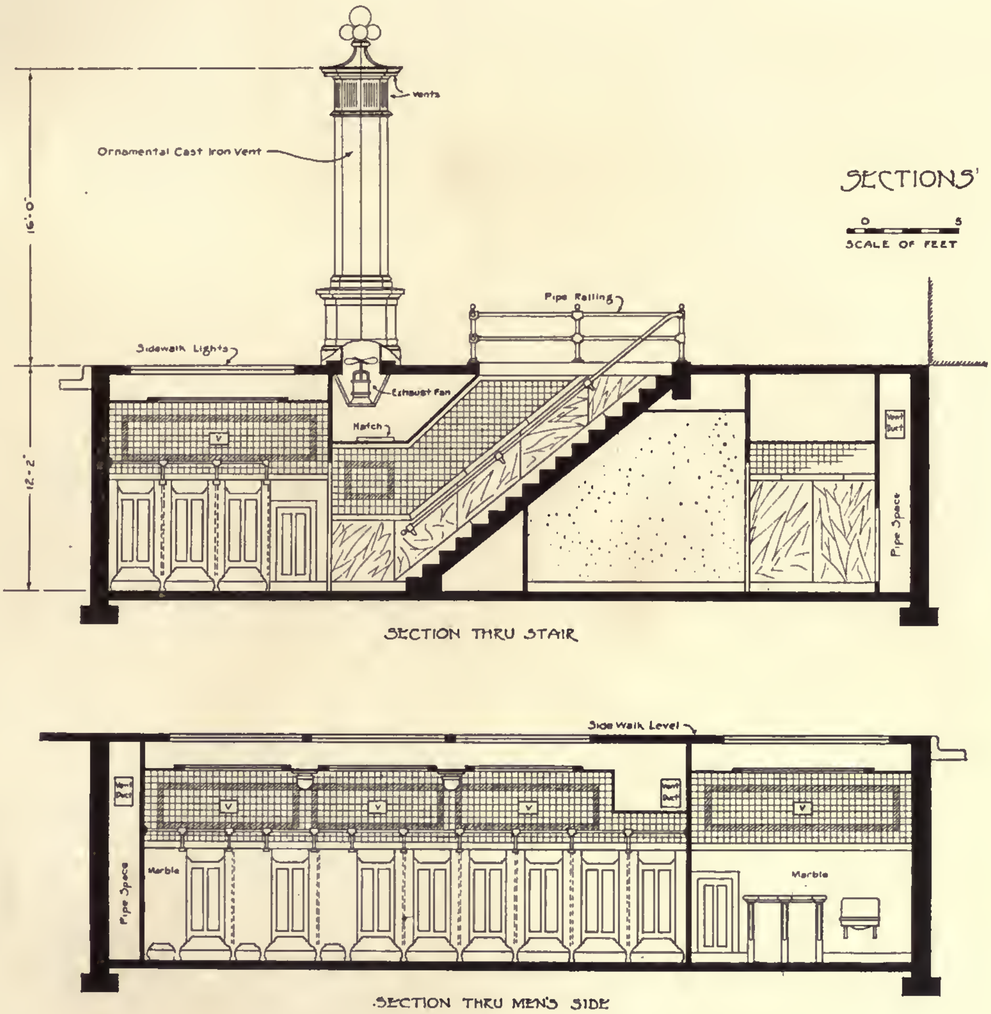
*(To be continued).*

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## DALLAS PUBLIC COMFORT STATION

### A comfort station in which provisions are made for two races

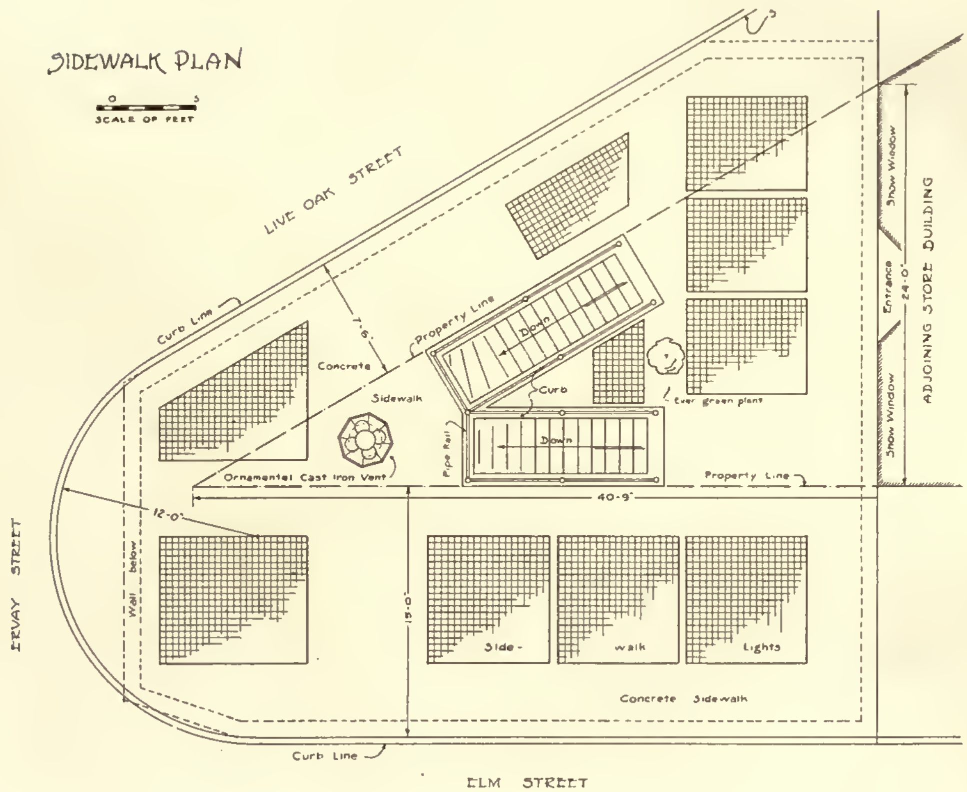
PUBLIC comfort stations in Northern cities where the race question is not raised, are simple by comparison with similar utilities in Southern cities. Public Comfort Station, No. 2, Dallas, Texas, has four separate divisions, one for white men, one for white women, one for negro men and one for negro women. It was considered desirable to have separate stairways for the two races but space did not permit. In each of the white divisions there are several pay toilets, each provided with a lavatory. There are two attendants constantly on duty until midnight, one in the men's, and one in the women's divisions.

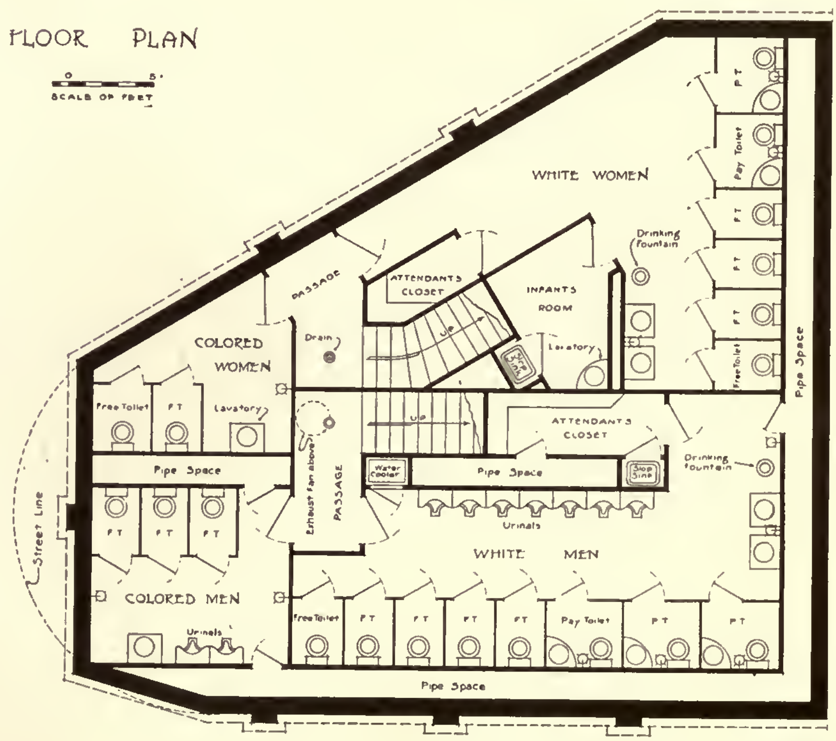



Public Comfort Station, No. 2, Dallas, Texas
J. Ed. Overbeck, Architect

Each division has a drinking fountain, the water being cooled in continuous coils around the interior of the ice chamber of an ice box into which ice is put from the top. The place was piped for gas for heating purposes, but so far no heat has been required to keep it comfortable.

An exhaust fan is used for ventilation. Vent ducts extend from a chamber below the exhaust fan, with connection to each division at several points and to each individual toilet and urinal stall. The fresh air is taken in through the entrance doors, which are seldom, if ever, closed.




PUBLIC COMFORT STATION, No. 2, DALLAS, TEXAS

Provision made for two races with common entrance. No superstructure

J. Ed. Overbeck, Architect

The foul air is discharged through a metal shaft extending 16-ft. above the sidewalk. The vents from the plumbing fixtures also enter this main discharge shaft. The shaft is enclosed in an ornamental cast iron casing with openings at the top to let the air out. The open top being so high above the sidewalk and quite a distance from any building, no objectionable odor has ever been noticed.

The place is lighted at night by electric lights placed in fixtures directly against the ceiling between prism glass sash. Practically no reflection goes up through the sidewalk glass. The only plumbing pipes placed below ground are the soil or waste pipes which are all extra heavy cast iron. All other pipes are placed in overhead spaces provided for them and are at all times accessible for inspection or repairs.

A suspension ceiling is used to conceal beams and all overhead work. The greater part of the ceiling consists of prism glass in removable sash which can be taken out for cleaning the glass. The remainder of the ceiling is plastered. The sidewalk, forming the roof, is of reinforced concrete, the grade surface studded with prism sidewalk lights for lighting the station.

Marble treads were used for the stairs but they wore rapidly, especially on the men's side, so were replaced with treads of a more serviceable type. The floor is laid with 9 x 9-in impervious red tile with 1/2-in. gray tint tile strips between all pieces. The border is a nine inch gray flint tile and the base is of gray flint tile six inches high. Italian marble is used for all wainscoting, divisions between and fronts of toilets to a height of six feet. The walls above the marble are of white semi-glazed tile in 4-in. squares, with tile molding in the ceiling angle. Mahogany is used for doors and all wood finish.

Lack of space and the restrictions placed upon the construction of the station brought the two stairways close together at the grade level. A large evergreen plant was placed between the stairways and no complaints have been made.

The architect had a nice little problem in the design and construction of this station. The irregular corner was acquired through the widening of Elm Street and the cutting of from twelve to fifteen feet off the fronts of buildings. There was so little left of the corner lot that it was decided to put a comfort station on the piece salvaged. In the agreement between the city and the owner of the adjoining property it was stipulated that nothing was to be built above the sidewalk level that would, in any way, obstruct the view of the neighboring store. This prevented even the erection of a hood over the stairway, so that all rain falling on the stairs is taken away by a floor drain at the bottom. The only thing above ground is the vent shaft.

The station was built jointly by the city and the city Park Board, each paying half the cost.

# JURISDICTIONAL DISPUTES

THE Associated General Contractors of America reports that, together with The American Institute of Architects, The Engineering Council, The National Building Trades Employers Association, and the Building Trades Department of the American Federation of Labor through the National Board for Jurisdictional Awards they have reached a national agreement through a resolution heavily penalizing union workmen who refuse to abide by the decisions of the Board.

The resolution provides that local building trade councils of union labor shall suspend unions and refuse to recognize or support those unions which refuse to abide by decisions of the National Board. It also provides that general contractors and sub-contractors who employ only union labor shall incorporate in their agreements with labor a provision that will secure compliance with all the decisions of the Board. Employment will be refused to members of local unions which do not abide by such decisions and architects and engineers are requested to insert in all their specifications and contracts a clause that such decisions shall be followed.

Of the seventeen international unions that constitute the Building Trades Department of the A. F. of L., sixteen have unqualifiedly endorsed the work of the Board and supported its decisions. The United Brotherhood of Carpenters and Joiners alone, although one of the original organizers of the Board, now refuse to support it. As a result they have been suspended from the Building Trades Department of the American Federation of Labor, and through this resolution are outlawed by every building trade council, and the leading organizations of general contractors, sub-contractors, engineers and architects in the country.

The Members of Jurisdictional Board are: E. J. Russell of St. Louis, Chairman, American Institute of Architects, R. P. Miller of New York Engineering Council of Federated American Engineering Societies, Col. John R. Wiggins of Philadelphia and F. J. C. Dresser of Cleveland both of the Associated General Contractors of America, C. C. Pierson, of Indianapolis Building Trades Employers Association, John J. Hynes, John Coefield, Thomas R. Preece, of the Building Trades Department of the American Federation of Labor, and Wm. J. Spencer, Executive Secretary, American Federation Building, Washington, D. C.

# ELECTRICITY IN THE HOUSE

## II — THE LIVING ROOM

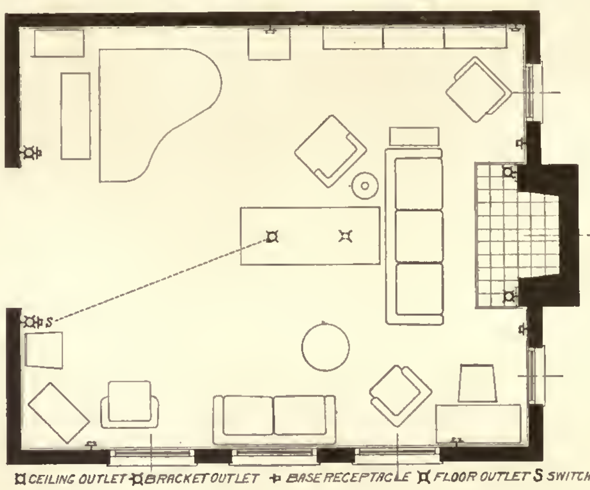
BY M. O. WHITTEN

FOR many people, the best way of learning to swim is to jump in; similarly, the best way to study the wiring of a modern home is to go right ahead and wire it,—on paper.

And the best point at which to make the plunge seems to be the living room, possibly because the very words, "living room" suggest that space not merely as four walls and ceiling, but as a much inhabited place, the center of family activities. The writer believes that the secret of a successful house wiring plan lies in the ability to visualize the usage of the house. If one can know thoroughly what people are going to do in a room, it becomes much easier to plan its electrical facilities.

Also, in selecting the living room as point of entrance into the subject, one is brought face to face with another problem,—that of the scale of living. Now, while among the very wealthy, we still have separate drawing rooms, reception rooms, a library, or music room, and the informal sitting room, the tendency with the ordinary dwelling of the better type has been to combine all or nearly all of these functions in one large living room. This is true of houses well on towards the mansion, although in many instances, the living room is supplemented by an enclosed porch, or entrance hall enlarged into a reception room, or an upper hall is so treated as to provide a small sitting room. Therefore, in selecting a typical house plan for the purpose of the present series of articles, the writer will follow this tendency, and assume a living room which is, as occasion demands, parlor, music room, library and family sitting room. The electric wiring provided for this room has been developed with these various usages in mind, the object being to secure a system sufficiently flexible to answer all the requirements placed upon it.

The plan chosen shows a living room, 14 by 18 feet, with three windows along its southern wall, while at the eastern end is a large fireplace, flanked by two smaller windows. At the western end is the wide entrance from the entrance hall, the one long, unbroken wall being at the north. With this as framework, the following arrangement of furnishing is suggested, not as anything especially original or striking, but merely as that frequently followed by interior decorators in handling rooms of this general style. No particular brief is held for this room plan, the idea being simply to select some logical, reasonable arrangement of furnishing, sufficiently detailed as to bring out electrical requirements.




A living room wired for maximum comfort and convenience. Typical layout to meet demands of modern life

On this assumption, then, in the northwest corner, using some seven or eight feet of the unbroken wall space, is placed the piano, with its bench and music case. Beyond this, the wall is given up to book cases, three or more, depending on the taste and inclinations of the family. Carrying out the library idea in this section of the room is a small table, while in the northeast corner, flanked by a case and a window, a large easy chair placed between the magazine stand and the center table tends to fill out the grouping at that end of the room.

The next division of the room is grouped around the fireplace, before which is located a large, comfortable couch, near one end of which is the magazine stand. In the southeast corner is the desk, well lighted by day from the east window nearby. The position chosen for the center table was selected partly to block off, as it were, the book corner, and at the same time to leave practically all the general southwest part of the room as an unbroken space, desired both for aesthetic reasons, and for availability in entertaining. This is furthered by the small sofa or settee in the middle of the south wall flanked by a small round table. The settee leads down to the southwest corner where an easy chair and the tea-wagon are placed. These locations provide a listening group for the piano, while the position of the tea-wagon at the entrance of the room, suggests its ready shifting for use on the porch or elsewhere in the house.

THIS room arrangement being accepted in principle, as the diplomats say, the next step is to develop the electric wiring plan necessary and desirable. To begin with, the writer recommends a central lighting fixture, supplemented by bracket and portable lamps. Were this room library, music or sitting room only, the central fixture could be dispensed with, but it is rather difficult to imagine any very cheerful social function enacting itself by the dim and soothing light of a few well shaded wall brackets.

Proceeding, then, with the wiring. To the right, as one enters the room, are placed the switches that control the center light and the wall brackets. Lighting or portable lamps, however, can well be left for local action. For general illumination, wall brackets are provided in symmetrical positions, at either side of the hall entrance, and to right and left of the fireplace. A double base-board outlet is also recommended at each of these locations; that to the right of the entrance, will take care of electric equipment for the tea-wagon, and the one at the left, will permit use of a floor lamp for the piano, if desired. The receptacles to the left of the fireplace supply the desk lamp nearby, while the outlets to the right are recommended on general principles; they will permit use of the tea-wagon at that point, provide an outlet for the vacuum cleaner, allow for the location of a fan in hot weather, or supply a lamp or electric candles on the mantel. In other words, this arrangement will secure that flexibility of usage which is the goal of a good wiring system.

IT will be noted that no brackets are allotted to the north of the room, but any lighting required is derived from base-board receptacles, one located just beyond the piano, and one at the further end of the room. On a long, unbroken wall space it is difficult, both for aesthetic and practical reasons, to give brackets a satisfactory placement; if the brackets are located in accord with a furniture plan, a later change of that plan would leave the brackets without any *raison d'etre*. On the whole, the base-board receptacle provision is safer, and more flexible. For this particular room arrangement, one suggests a table lamp as indicated on the plan, and some other suitable lamp ar the further end of the book cases, supplied in its turn by the further receptacle.

The long south wall, broken by windows, is also better left without brackets, while the base-board receptacle near the desk gives the local illumination needed there. This receptacle is balanced by another at the west end of that wall, provided more on the general theory of flexibility, than for any immediate need as indicated by this particular arrangement of furniture. Following this out, it should always be remembered that a double base-board outlet costs practically no more than a single one, and greatly improves the general freedom and variety of usage afforded. A floor outlet under the center table supplies the floor lamp placed at the back of the couch, and also makes easily possible any desired use of electrical appliances on the table.

IT must be understood that this is an inclusive wiring plan, a wiring plan designed to give the greatest comfort and satisfaction in living, rather than to save wiring cost. While the writer will later offer a few suggestions for reducing expense, it may well be asked why should the wiring always be selected as the point at which to economize? When once the house is completed, changes and alterations to the wiring represent a fair degree of expense, and a certain element of inconvenience. Would it not be really more logical to forego some of the many coats of paint usually specified, or content oneself with a trifle less expensive wall covering, or something less palatial in bath room fittings, and in return for such saving, provide the client with a thoroughly livable, modern home? Architects designing homes today all recognize the importance of the domestic employment problem, more especially that phase of it represented by the absence or scarcity of "help," and take this fact into consideration when drawing their plans. It is also a fact that liberal use of electricity and electric appliances has done much and can do still more to temper the east wind to the shorn lamb, and the wise man will build his house accordingly.

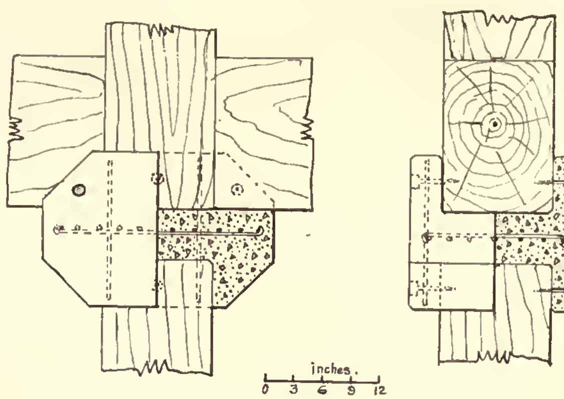
Having made this plea for an inclusive wiring plan, the author will now point out how such a scheme as that suggested, could be modified in the interests of economy, without great loss to the comfort of living. For instance, instead of having two receptacles along the north wall, one at about the central point could be made to do, and additional lighting for the book cases could be derived from the receptacle to the right of the fireplace. Likewise the receptacle at the west end of the south wall could be omitted, making the receptacle to the right of the entrance do double duty. Similarly, the floor outlet under the table could be dispensed with, the floor lamp being relocated, and supplied from the receptacle at the center of the north wall. Whether the loss of flexibility resulting from such a cutting-down is compensated for sufficiently by the money saved is a question which in every case must be left to the client to decide, after the architect has shown the better way.

# REINFORCED CONCRETE CAPS FOR WOODEN POSTS

MR. S. H. INGEBORG of the Bureau of Standards recently patented a reinforced concrete post cap and assigned his patent to the public. For this action he is deserving of much credit. Tests were carried out at the Underwriters' Laboratories, Chicago, to determine the value of these post caps as compared with post caps of metal. Not many years ago timber posts carried girders and beams by means of horizontal "pillow blocks" or corbels, which were strong beams but which reduced the carrying capacity of the posts by the difference between vertical and horizontal compressive strength in the timber used. Our forefathers sometimes used oak pillow blocks in order to effect a balance, when the posts, or columns were of pine or hemlock. The introduction of cast-iron was a decided improvement, for the full strength of the post was preserved. In case of severe fire cast-iron caps were dangerous if struck by water when heated. The use of pressed steel caps is now common for steel has greater strength and costs less per pound than cast-iron.

Failures in "slow-burning" mill construction are hastened by the giving way of metal post caps when heated. The reinforced concrete post cap was evolved to lessen this danger. Tests were made on 12 x 12 timber posts to determine how long they could carry a load in a high temperature fire. Tests were then made on posts with steel post caps after which tests were made with posts having reinforced concrete post caps. The posts with steel post caps failed sooner than posts without caps and the full strength was developed of the posts with reinforced concrete post caps. This amounted to doubling the fire resistance of timber mill construction by comparison with results given with steel caps. Thermo-couples embedded in the interior of each cap recorded the temperature at the middle of the end face of the post where it was in contact with the cap. The maximum temperatures reached were, 195 deg. F. for the concrete and 685 deg. F. for the steel caps.

The design of a reinforced concrete cap will depend upon the loads to be carried, therefore the reinforcement of the caps tested is merely indicated in the accompanying cuts. Vertical rods 1/4-in. in diameter were placed on each side, rods of the same size being used for reinforcement of the bed between the ends of the posts and extending into the corbels. In addition there were horizontal rods in each side attached to the vertical rods and wire mesh attached to the horizontal rods in the bed. No beams were carried in the tests, all the load being vertical and applied by means of a hydraulic jack.




The Ingeborg reinforced concrete post cap for slow-burning mill construction

It is too early to say that reinforced concrete post caps will replace those of cast-iron or steel. Direct shear will be high at the edges of corbels carrying beams and the allowable compressive stress in the best concrete is not equal to the compressive fiber stresses used with timber columns. Either the concrete must be used with a lower factor of safety than is considered wise, or the allowable fiber stresses in direct compression in timber must be reduced. Concrete post caps to be efficient must be made with great care in factories and this will require that they be used near where they are made, as cartage, handling and freight will make them costly when shipped any considerable distance. The material is also liable to be damaged when handled several times.

Concretes using sandstone and limestone aggregates have not given satisfaction when subjected to fire. Good coke and carefully selected cinders should be good but concrete with such aggregates is deficient in strength. Granite or trap rock alone are good enough for concrete intended to be used because of its value in fire. The quality of the sand is of no less importance than the quality of aggregate. That the mixture should be rich cannot be denied. The caps used in the tests mentioned gave good results no doubt because the materials were carefully selected and carefully molded. The same quality of work will be hard to obtain commercially.

Several architects and engineers have suggested the use of concrete to fireproof metal post caps. Waxed paper would be placed within the caps, extending several inches beyond the edges to prevent the contact of wet concrete with the timber posts and beams. Sheets of metal lath to be bent into the space between the caps and the wood and covering the exposed faces. A rich plaster to be applied with trowels to cover the caps to a thickness of not less than one-and-one-half inches extending out over the wood, which is protected by the waxed paper. When the plaster is dry the projecting edges of the paper may be trimmed. This will give all the protection needed by the metal and will guard the greater strength afforded by metal caps as compared with concrete caps. The suggestion has also been made that at all ceiling levels the intersections of beams and posts might be covered with waxed paper over which would be nailed metal lath and over this can be shot Gunite to any desired thickness. The ideas may well be followed out until something really good is found as a substitute for the exposed metal post cap.

### Swimming Tanks and Spectators

THE architect is charged with many sins and one now being discussed is his failure to consider the rights and comfort of spectators at swimming tank meets. The swimming tank originally was a clever device to make bathing a sport and permit enthusiasts to continue swimming indoors during the winter season. For the sake of economy the tank was put in a basement where artificial lighting and poor ventilation often nullified all the benefit given by strenuous exercise in the water.

With the growth of public interest in swimming as a sport rather than as healthful exercise, come suggestions that in the future provision must be made for spectators. The latest criticism is from the sporting writer Fred A. Haynor who said in a recent issue of *The Chicago Daily News*:

Architects may not know it but they are being criticised. It all came out when Charles A. Dean, veteran official of the A. A. U. was discussing conference crowds and conference swimming meets.

"A swimming tank is built in this way," said Mr. Dean. "An architect has to draw plans for a gymnasium. He visits one of the big clubs and studies our antiquated tanks, antiquated as far as accommodating the spectator. As a result it is stuck in some corner down in the basement with absolutely no chance for a crowd to see the games of polo or swimming races in which Chicago is intensely interested.

"A tank should have a roof open to sunlight and air. There is no reason for putting it down in the basement. The Detroit A. C. has one on its fourth floor and the Cleveland A. C. has one on its tenth floor.

"I inquired once as to the extra cost of putting the tank on the roof and was told that the extra foundation and upward beaming would increase the cost by several thousand dollars.

"In addition to having sunlight, a tank should have plenty of head room. The air would be much improved if this were the case with our tanks hereabout. Most of the tanks have low roofs with fancy marble work. You pack a crowd in there and the close air deadens the speed of the swimmers.

"I am in despair when I referee a meet at the local tanks. Take at Northwestern, where hundreds fail to see the swimming meet and half of those who get in can see only half the water. Even there I have seen 500 people turned away because they could not get seats. Yet the Northwestern gymnasium outside is one of the most beautiful structures in the country. But the growing interest in indoor college athletics has not been met by any of the builders. The architects should come for their information to men of experience—men who handled these big meets—and let them present the problems growing out of the development of athletics."

### Paint as a Sound Absorber

TO reduce echo a common expedient is to apply a sound absorbing material to wall surfaces. Recent experiments with paint showed that painting makes a reflecting wall a good absorber.

In order to get at least an approximation of the sound absorbing properties of paint, a series of tests was recently made using a specially constructed metal cylinder three feet long and one foot in diameter, placed horizontally on a wooden base. In the center of the cylinder a watch was suspended. The observer then stood with one ear at the open end of the cylinder, and slowly moved away. The point at which he could no longer hear the tick of the watch was marked. The cylinder was then lined with coatings of paint and the test repeated with each. The results here given are averages of several readings by four observers.

*Greatest Distances from End of the Cylinder at Which Tick of a Watch Can be Heard.*

| | |
|---|---|
| Metal wall | 40 inches. |
| Metal wall with sand finish paint | 19 inches. |
| Metal wall with sponge finish paint | 18 inches. |
| Metal wall with cork finish paint | 14 inches. |

The sand finish was made by spraying sand upon a "tacky" priming coat of paint and applying finishing coats over the sand. For the sponge finish a heavy paste paint containing considerable dryer was applied. This was then "stippled" by means of a sponge pressed lightly against the surface and quickly withdrawn. The cork finish was made by pressing ground cork against a "tacky" priming coat of paint and covering it with finishing coats.

The foregoing was taken from "Paint as an Aid to Proper Acoustic Conditions" by Henry

Gardner and William Dawnie, a lecture delivered in February, 1922 before the International Association of Master Painters and Decorators, Kansas City, Mo. The lecture has been printed in pamphlet form for free distribution by the Educational Bureau of the Paint Manufacturers' Association of the U. S., Washington, D. C.

### Motor Truck Storage Design Data

IN an article on "Live Loads for Motor Truck Storage" in *Engineering News-Record,* February 9, 1922, E. L. Verveer suggests for general use the following live loads per square foot for the *beams* and *girders*: 1-ton trucks, 100 lb.; 1½-ton trucks, 115 lb.; 2-ton trucks, 125 lb.; 2½ and 3-ton trucks, 150, lb.; 3½ and 4-ton trucks, 175 lb.; 5 and 6-ton trucks, 225 lb. For the *floor slab,* these loads should be increased 50 per cent. For storage of trucks of mixed capacities, 125 lb., for 1 to 3-ton trucks and 200 lb. for the others are recommended, these loads also to be increased 50 per cent for the floor slab.

### Aesthetics in Highway Bridge Design

IN the *Quarterly Report,* Jan. 1, 1922, A. R. Hurst, state highway engineer of Wisconsin said; "The matter of æsthetics in highway bridge design has received much more attention of late than ever before and the time is here when the plan of every bridge designed by the state highway commission will receive careful consideration from this point of view. The necessity for good appearance is greater in a permanent structure than in a structure of temporary nature. Permanence ceases to be a virtue where an ugly structure is concerned."

### The Hoover Committees

IN a recent report to President Harding Mr. Hoover reported the appointment of the following committees for the purpose of securing constructive solution to some of the more general problems that cause the blockade on housing.

COMMITTEE ON SIMPLIFICATION OF MUNICIPAL BUILDING RULES:

Ira H. Woolson, Chairman, Consulting Engineer. Nat'l Board of Fire Underwriters, New York City.

Edwin H. Brown, Architect, Minneapolis, Minn. Chairman, Committee on Small Houses, American Institute of Architects.

William K. Hatt, Professor of Civil Engineering, Purdue University, Director, National Research Council.

Rudolph P. Miller, Ex-Superintendent of Buildings, New York City, Chairman, Building Officials Conference.

J. A. Newlin, Forest Products Laboratory, U. S. Dept. of Agriculture.

Ernest J. Russell, Architect, St. Louis, Mo. Chairman, Nat'l Board of Awards for Jurisdictional Disputes in the Building Industry.

Joseph R. Worcester, Consulting Engineer, Boston, Mass.

COMMITTEE ON SIMPLIFICATION OF PLUMBING REQUIREMENTS AND PRACTICE:

George C. Whipple, Chairman, Director, School of Sanitation, Harvard University.

William C. Groeniger, President, American Society of Sanitary Engineering.

William J. Spencer, Secretary-Treasurer of Building Trades Dept., American Federation of Labor.

H. Y. Carson, Research Engineer, American Cast Iron Pipe Company, Birmingham, Ala.

A. L. Webster, Sanitary Engineer, 112 East 40th Street, New York City.

A. E. Hansen, Sanitary Engineer, 2 Rector Street, New York City.

Thomas F. Hanley, Chairman, Standardization Committee, Nat'l Association of Master Plumbers.

COMMITTEE ON CITY ZONING:

Louis A. Moses, Cleveland, Ohio, Representing the Nat'l Association of Real Estate Boards.

J. Horace McFarland, Harrisburg, Pa. Representing the American Civic Association.

Nelson P. Lewis, New York City, Representing the Nat'l Municipal League and the Nat'l City Planning Conference.

Lawrence Veiller, New York City, Representing The Nat'l Housing Association.

Morris Knowles, Pittsburgh, Pa., of the United States Chamber of Commerce.

Edward M. Bassett, New York City, Chairman of the Zoning Committee of New York.

Frederick Law Olmsted, Brookline, Mass. President of the Society of Landscape Architects.

John Ihlder, Washington, D. C., of the United States Chamber of Commerce.

COMMITTEE ON CONSTRUCTION INDUSTRIES:

Ernest T. Trigg, President Nat'l Federation of Construction Industries.

Joseph H. DeFrees, President United States Chamber of Commerce, Washington, D. C.

John Donlin, American Federation of Labor, Washington, D. C.

Alexander M. Linnett, President U. S. League of Building and Loan Associations, Newark, N. J.

Irving B. Hiett, President, Nat'l Real Estate Board, 612 Madison Avenue, Toledo, Ohio.

William Stabler, Comptroller, Metropolitan Life Insurance Company, New York City.

John H. Kirby, Houston, Texas.

Dr. J. T. Duryea, New York City.

Charles Warner, Wilmington, Del.

Richard E. Schmidt, Chicago, Ill.

Gen. R. C. Marshall, Washington, D. C.

C. F. Lang, Cleveland, Ohio.

Daniel Crawford, Jr., Philadelphia, Pa.

William L. Monroe, Pittsburgh, Pa.

# THE AMERICAN SPECIFICATION INSTITUTE

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*Publishers,* The American Architect and The Architectural Review.

## The Annual Winter Conference

FOLLOWING the paper presented by Mr. E. B. Wilson (reported in the previous issue of The American Architect and The Architectural Review) the Chairman introduced Professor Duff A. Abrams, of the Structural Materials Research Laboratory, Lewis Institute, Chicago.

Professor Abrams expressed interest in the purpose of the Winter Conference and stated he was glad to note that the Joint Committee report had been followed so far as the fundamental features of concrete are concerned. He called the attention of the meeting to the fact that the report of the Joint Committee is one of the greatest steps that have been taken to advance the art of concrete construction.

The most important matter that must be dealt with, according to Professor Abrams, is the control of the water content and the slump test method of determining the consistency, so far as the water ratio is involved, is one method that does not introduce very great refinements. The slump test should not be interpreted too strictly; the inspector should not reject a batch of concrete merely because the slump was an inch or two more or less than was required by the specification. The fundamental idea of the slump test is to insure the mixing of concrete of approximately the consistency required in each batch and to prevent variations from soupy concrete to dry concrete in different batches. In too many cases of actual construction work the concrete is mere soup and consequently is of very low strength and resistance.

Recently a gentleman called on the telephone, Professor Abrams said, to report that on one operation tests showed a strength of from six hundred to eight hundred pounds in fourteen days and from ten to eleven hundred pounds in twenty-eight days, the concrete being a one to four mix. Under such circumstances about twice the strengths reported should have been obtained. Answers to questions asked by Professor Abrams indicated that the cement was entirely normal and the aggregates of fairly good quality. But the concrete was "quite wet" and therein lay the cause of the trouble.

With respect to the tables for the proportioning on concrete (these tables accompany the tentative specifications of The American Specification Institute and were prepared by Professor Abrams) attention was directed to the mixtures printed in bold face type, which were intended for use on work where no tests are made and where virtually no control of the concrete mixing existed. Professor Abrams said that the use of these special tables would have a tendency to require the use of more cement than would be necessary if the proper control was exercised and, in consequence, would tend to penalize the mixer somewhat.

Professor Abrams explained that these tables are the result of about six years' work and that approximately one hundred thousand tests had been made to produce data on which the tables could be based.

A spirited discussion of the paper presented by Mr. Wilson, Professor Abrams' talk and the specifications ensued. There seemed to be an agreement that in the matter of peripheral speed of drums, in that type of mixer, specifications might be so strict as seriously to penalize the mixer on the work. It was suggested that the manufacturers' recommendations as to the time of mix and the peripheral speed of the mixer should be considered as machines are designed to produce certain results and it could not accomplish the best work if it was governed entirely by the specifications without consideration of these recommendations.

With respect to the time of mix of each batch, Professor Abrams said: "With reference to this matter of speed rotation of the mixer drum I may say that we made a very serious test three or four years ago along that line, using a rather small mixer, however, but one which I believe gave us results comparable to results to be secured from other mixers.

"In this test we ran the mixer exactly one minute in every case and varied the rate of rotation from eight revolutions per minute up to about thirty revolutions. The manufacturer's rating on this particular mixer was eighteen revolutions per minute, consequently our tests were carried considerably beyond the manufacturer's recommendation.

"We found that eight revolutions per minute gave us somewhat lower strength than the others and thirty revolutions per minute also gave somewhat lower strength. However, as between twelve revolutions and twenty-five revolutions there was very little room for choice. In other words, the mixing action seemed to be largely independent of the number of revolutions so long as the actual time of mixing was the same, so that it seems to me that the actual speed of a mixer, judging from these tests, is not of very great importance.

"The time element seems to be one of the important factors. As to the effect of time of mixing, we found that increasing the time of mixing beyond, say, three-quarters of a minute gave about ten per cent increase in strength each time we doubled that. In other words if we change the time of mixing from three-quarters of a minute to a minute and a half the strength increased about ten per cent. If you increase the time from one minute to two minutes the increase in strength remains about ten per cent.

"I believe that the time element is the better measure because if you put it on the revolution basis you will be penalizing the larger mixers for the reason that they do not operate at as great a number of revolutions per minute as do the smaller ones, and you involve a great deal of other difficulties that could be avoided if it were placed on a purely time basis.

"Of course this matter of mixing action varies according to the class of mixer and the nature of the concrete so it seems best to fix a more or less arbitrary time which will be satisfactory and economical and I believe the minute is about the proper period."

The Acting Executive Secretary read the report of the New York Committee of Contractors on Provisions of the Joint Committee Report as published in the January, 1922 issue of *Concrete* as it was considered that the criticism of the Joint Committee report given therein should be presented to the meeting.

### Nominations for Board of Governors

In accordance with Section 2 of Article VII of the By-Laws the following members were appointed a nominating committee to propose a list of nominees for the Board of Governors:

Mr. Hugh Borland, Chairman, Mr. Franklin H. Coney, Mr. George C. Wright.

This Committee has reported to the Board of Governors the following names as their selection of nominees:

Mr. Ralph W. Yardley, Mr. R. Jarvis Gaudy, Mr. Chester L. Post, Mr. Frank A. Randall, Mr. Gardner C. Coughlen, all of whom are now serving as the Board of Governors.

Section 3 and Section 4 of Article VII of the By-Laws say:

Sec. 3. Any group of thirty (30) members may prepare a list of nominees for the Board of Governors at least thirty (30) days before the first Monday of May of each year.

Sec. 4. All lists of nominees for the Board of Governors shall be in the office of the Executive Secretary thirty (30) days before the first Monday of May of each year and the Executive Secretary shall mail ballots, containing the names of all candidates, to all members not later than ten (10) days thereafter.

APPROACH TO THE ROTUNDA, SHOWING DECORATIONS
BY JOHN SINGER SARGENT IN THE BOSTON
MUSEUM OF FINE ARTS

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

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# THE SARGENT DECORATIONS IN THE BOSTON MUSEUM OF FINE ARTS

BY C. H. BLACKALL, F. A. I. A.

THE decorations by John Singer Sargent have now been before the public in the Boston Museum of Fine Arts for a sufficient time to permit of a deliberate judgment of what they really are, how far they succeed and wherein they are limited. They represent the mature work of an artist who made for himself a brilliant reputation in the beginnings of his work in this line, and whose progress as a decorator has been followed with deepest interest by all who hope for the future of art in America. Especially is his work of value to the architect, who by the very nature of his association, appreciates that decoration is such an important factor of real architecture, and who appreciates also the few cases in which either in the present time or the past, architecture and decoration have been successfully combined. Indeed the opportunities for a decoration of this kind are so rare, that when an artist of Mr. Sargent's caliber undertakes it and is given the free hand which he had here, we look for something which would be criticised and judged by a very different standard from what would be considered in connection with work where the field were more restricted, or the opportunities more circumscribed. These decorations have been described in bulletins and illustrated to a certain extent in several of the nonprofessional periodicals. Much has been published about them, most of it of a laudatory character, and little has been said in questioning the propriety or the success of these decorations, and indeed it seems to be assumed in some circles that it is rank heresy to take any other attitude towards it than that of unquestioning acceptance and reverent, awe-struck admiration just because it is John Sargent's work. But since the questioning attitude is a condition of growth, and because we would wish to see American architecture and decoration attain their best development, we are certainly justified in applying to this work some of the methods and analyses we would apply to any other great work, weighing it for itself without being blinded in our judgment by either the glamor of the man who did it, the past work he has done so well, or the manner in which similar problems were met when the conditions were so different that a choice of solutions was afforded.


A Larger Panel

Regarding Mr. Sargent's ability as a painter, there need be no question. The heights to which he has risen as a draughtsman, as a colorist, a portrait painter and a thinker mark him as one of the great artists of the time, but we can properly consider his work here as a specific decoration of a specific piece of architecture, especially coming as it has after the Public Library in Boston, where his decorations were in a room otherwise of a slight architectural interest, and where the decorations were really the whole thing, the while in the Art Museum a great painter has undertaken to decorate a portion of a highly developed, organic structure where the architecture of the apartment could not be ignored either by himself, or by reference to the architectural forms immediately preceding and leading up to it. It is proper, then, to consider this simply as a decoration of a dome of the Boston Art Museum and as something which must be judged by its fitness for its place rather than of a sample of painting by a great artist.

The decorations are applied to the surface of a dome over a rather small rotunda at the head of a wide, monumental stairway and at the intersection of the axes of the principal floor of the museum. It is a point eminently fitting for decoration. The dome is an ellipse in plan, and was originally heavily caissoned throughout without any structural or decorative treatment. The walls and ceiling were, and still are, all of plaster, the plaster work being painted to match as closely as possible the rows of limestone columns which flank each side of the principal staircase. The floor is of Knoxville marble, so that the whole effect is a monotone of gray buff stone color. The cornices and arches are of plaster and there is no attempt at lining or showing courses, but it is all frankly nothing but plaster work. When Mr. Sargent took up the problem, he very rightly decided that the caissoned ceiling would not be suitable, that no arrangement of panels could properly go with such a surface treatment, and accordingly, under his direction, the whole surface of the dome, and to a certain extent, of the supporting disposition was modified in accordance with his idea of the decorations. The surface now is intersected by round arches with plain archivolts on the axes of the dome and the pendentives, if such term can be applied to the continuous corner surface, are marked only by perfectly plain ribs springing from the cornice to a perfectly plain ring around the base of the skylight which lights from above. This disposition divides the space into eight surfaces. On the four principal surfaces over the arches are arranged large oval frames containing

The Rotunda

paintings. The bases of the pendentive surfaces are occupied by bas-relief groups set in architectural frames. Around the upper surfaces of the pendentives are smaller circular panels crowned by modeled figure work, and between the framed reliefs and the rounds of the pendentives are isolated cameo reliefs applied to the perfectly bare surface. There are no structural lines whatever, the ribs are throughout perfectly plain and with no attempt at decoration whatever. The principal surfaces between the ribs on the axes are treated as units in the sense that the decoration is extended over the whole surface and these surfaces are given a frame and setting of very carefully chosen mouldings, but the appearance of the dome is es-

Relief at base of pendentive

sentially that of a constructive reinforced concrete motif.

As previously stated, the general color of the whole apartment, indeed of the whole building, is of buff Indiana limestone and this color has been adhered to in the dome, lightening up somewhat from the wall color, and carried throughout all the ribs and the surfaces, except in the major panels themselves. The dominant color effect is a very pleasing blue, not a Wedgewood, but suggesting it. This blue is the background of all the painted panels and establishes the color scheme in conjunction with several tones of gold, varying in effect from a pale lemon to a deep red gold. The paintings have in addition a narrow band of deep red against the blue and the frame. Aside from this the gray of the plaster and stone work goes practically everywhere.

The subjects are matters of interest but of no special importance from a decorative standpoint. They are not in the slightest degree connected in theme. They include representations of the Three


Isolated bas-relief in center of pendentive

Arts protected by the heathen deities, of the Nine Muses, and of the Chimera and the Sphinx. Just what relation these would have to the decoration of an art museum is not evident, and perhaps not important. The principal point is the decorative quality of the whole and its coherence in place.

The disposition of the main oval panels is a very happy one, and the spotting of these on the domed surface, together with the strong notes of color of the small pendentive medallions, is one of the fine features of the composition, in that they tie well together and are each proportioned so admirably to fill a very awkward space. The first impression of the dome is a very pleasing one. The effect of the individual groups taken by themselves, and especially when viewed in the detached photographs, is also very agreeable. The introduction of the sculpture gives a variety which is fully justified. It is in the treatment as a whole that a sense of incompleteness, rawness, is most evident. We are told that Mr. Guy Lowell, who is the architect of the Museum, had nothing to do with this work, and that Mr. Sargent called in Mr. Thomas A. Fox as his architectural adviser, but architecturally there is no evidence of any thought being given to it in relation to the rest of the building. It is a different note, while a pleasing one, but it is incomplete. One would wish that there were some recognition by color treatment of the fact that the dome was to be entirely decorated. One may admire the cameo qualities of the paintings, and then wonder why some of this same treatment was not carried down the pendentives to complete the structural sense of applied color which is so absolutely lacking. Again the frames for the beautiful figures at the bases of the pendentives are excellent themselves, but they have the effect of being crowded into the spaces, and being exactly the same color as the background, barring touching up with gold and the slight tone behind the figures, they seem like importations rather than incorporations. And when one considers the different parts in relation to the whole, one is struck by the utter absence of anything like a sense of scale. Apollo and the Muses and the corresponding large panels are one scale, not quite the same. The Three Arts is a different scale, and the Sphinx and the Chimera still another, while the small round pendentive paintings are unlike any of the others in scale. The same is true of the sculpture. It is not in scale with the painting, the different groups are not in scale with themselves, there being in the sculpture at least three different scales, none of them related to the general decorated scheme. Whether this is a fault or a touch of genius may be a matter of opinion. Whether unity is even to be desired in a decoration of this kind is apparently seriously questioned by the artist, but speaking only from the architectural standpoint, one cannot but regret that the architectural hand and restraining factors which go to make up every great decorative work could not have been exercised here. There is too much detached easel work and not enough decoration as such. Mr. Sargent simply has not decorated the dome at all. He has arranged some more or less slightly correlated paintings on a domical surface with no sense of fitness and no constructive feeling, and it is not architecture, nor even decoration of architecture, but painting pure and simple. Even his bas-reliefs are really pictorial, and as for the cameo reliefs in the center of the pendentives, it is a question whether the whole composition would not have gained immensely if they were entirely omitted; but again that is a matter of point of view. But granted that the painting is all its enthusiastic admirers claim for it;—granted it has subjective interest and delicate, beautiful color, all of which is another story, it is not decoration of architecture, but decorative panels, which is very different. It is not decoration of architecture because, first, the architectural forms are absolutely ignored; second, because it in no sense covers the surface but concentrates on arbitrary spots; and third, because the whole thing is subjective rather than objective—a matter of detail, with no sense of mass or unity. Every detail, examined by itself, seems complete, not a part of a scheme, and except for its color, every part is more enjoyable and more appreciated in the photographic reproductions than in place. There simply is no scheme, no dominant thought, no intelligent grouping. Somehow, having in mind Mr. Sargent's personality, this work seems strangely unlike him, or as if he had done it under very unusual and varying moods. The difference between the end of the Public Library, which is simply bursting with ideas and colors, and this dome, which is refined almost to the vanishing point, like a piece of rare Wedgewood, does not seem compatible with Sargent's artistic physique and his past work.

And yet when we say the worst we can about it, criticise it most severely, object most strenuously to it as decoration, we are moved by its intrinsic beauty. It strikes a joyous note in an otherwise rather monotonous interior. It redeems a dull spot at the top of a long flight of stairs. One comes back to it with increasing joy, even though with increasing conviction of its being fine painting rather than fine decoration; and measured by every great work of the past, by the great masters of today, even measured by Sargent himself, in his magnificent beginning on the north end of the Public Library, which is truly at once decoration, painting, fantasy, fancy, imagination and pure art,—measured by all the standards architects and decorators have aspired to for five hundred years, it is beautiful, yes;—interesting, yes;—reproduces well, yes;—affords excellent opportunities for easel enjoyment;—but it is not decoration.

# THE JUSTIFICATION OF THE ARCHITECT IS ARCHITECTURE

BY ERNEST FLAGG

*IN the following article, Mr. Ernest Flagg discusses certain phases of architectural practice and architectural education from his point of view. He makes his points and emphasizes his arguments with a certain degree of logic, but frankly we do not agree with some of his contentions. It is for that reason we are glad to print this article, believing that while from time to time the policy and attitude of* The American Architect *have been very plainly indicated those of our readers who are not completely in accord with our opinions should be afforded an opportunity to present their own arguments, especially when set forth based on experience so long and so active as that of Mr. Flagg.*

The Editors.

IT would be interesting to know what percentage of the building of the country comes under the control of the out-and-out architect and how much is done by the architect-builder and others.

Reckoned by number certainly the great majority of buildings come under the latter class. The builder of that kind of small house which constitutes the major part of new construction, sees no more reason for employing an architect than does the ordinary builder of tenements, factories, etc. The contractor will gladly furnish such drawings as are needed and the owner thinks he gets them free.

Although most buildings, made without the services of the professional architect, may be inexpensive, that is by no means true of all. The small architect-builder is not the only one who is displacing the architect.

Formerly the architect acted as the sole intermediary between his client and the doers of the various kinds of work such as masonry, carpentry, plastering, plumbing, painting, etc.; but now another has appeared in the person of the general contractor who does more or less work himself and farms out the rest. His strong argument is that he can give the owner a fixed price.

At first, in deference to long established custom, the general contractor interfered little with the architect. He thought, and indeed sometimes still thinks, that it may be more to his interest to cooperate with the architect than antagonize him. The general contractor, as has been said, likes to do as much of the work as he can himself and he generally feels quite competent to deal with architecture, even if he does not undertake it.

As architecture, with us, drifts further and further away from the status of a profession towards that of a business, and as the architect relinquishes the functions of the artist for those of a lower order, it becomes increasingly evident to the general contractor that he himself is of the elect, so far as "architecture" is concerned. Is he not better equipped for business and is he not in closer touch with the work than the architect? So sure is he of his position that he often offers to help the latter. He maintains a staff of draughtsmen and can sometimes relieve the architect of a great deal of work.

Both contractor and architect would indignantly deny that there was any thought of bribery in this, but that is certainly what it often amounts to.

St. Luke's Hospital, New York, was my first commission. Soon after its award a prominent contractor called, congratulated me, and said he would like to bid on the work when the plans were ready. In the meantime he offered to place his engineering staff at my disposal in getting out the structural steel drawings. He said this would save me a great deal of money and also benefit my client because he could make a lower bid for work based on his own drawings than otherwise. Finally he assured me that neither I nor the hospital would be under any obligations—a statement which I thought would probably be true as regards the hospital.

The feeling which formerly prompted the general contractor to interfere as little as possible with the architect, seems rapidly wearing off, and more and more openly he advertises both to construct and design.

A few years ago the late Mr. Walter Kerr of the contracting firm of Westinghouse, Church, Kerr & Co., told me of a great building project his concern was about to undertake. At first I thought he intended to consult me as architect, but I was soon undeceived. He said he had a whole loft full of architects in his employ who would attend to that part.

Some time ago I had occasion to visit Mr. Arthur Hoggson of the contracting firm of Hoggson Brothers, on a matter of business and before I left he showed me through his admirably appointed establishment where, among other things, I saw a full fledged architectural department in operation. On the walls were drawings of completed work as much like that of the ordinary American architect as if made with the same rubber stamp.

Not long ago I applied to the Board of Standards and Appeals for permission to carry on architecture in a house of mine on a street restricted against business, that request having been denied by the Building Department. I contended that mine was a profession and that the restriction against business did not apply. One of the Board said, "I should call architecture a business."

And is it not true that most of what is commonly called architecture, in this country, is carried on as a business?

In numbers, as has been said, the vast majority of the buildings of the country are designed by men who make no pretense of understanding the principles of design; while most of those who claim to be architects, in the full meaning of the term, certainly do not always apply them in their work.

A general survey of the present day architecture of the country can hardly be flattering to our *amour propre.*

Do our constructions add to the beauty of nature?

Is it not true, with us, that where man comes beauty generally vanishes from the landscape?

Are the suburbs of our city pleasant to look upon?

Except in the best part of cities, what unadulterated ugliness generally meets the eye. In New York, for instance, walk at random at either side of the better part and what sordid, hopeless lack of beauty does one find. What an environment in which to live! Why should people care to exist if condemned to such surroundings! One who is not utterly callous to the finer feelings must be depressed and disheartened by what he sees. Or if he confines his steps to the better parts of the town what jarring discords meet him. What a hodge-podge is presented for his admiration. What triumphal commercialism; what disregard of beauty; what monumental greed; what lies, in design and construction, face him at every turn. Buildings which violate the fundamental laws of good design over and over again, many of them constructed at enormous cost by architects who stand high in public esteem.

The fundamental laws of good taste in design are little taught in this country and even among supposedly educated people it is rare indeed to find one who can give an intelligent analysis of the qualities of a design, while others who pretend to know the rules of art do not include common sense among them.

To many it may seem a grossly exaggerated statement to say, that with comparatively few bright exceptions, architecture is not practiced in this country. What passes for such is not architecture, as that term has been understood ever since man first began to take pride in construction, up to about one hundred years ago, but something else.

For a hundred years architecture has been overwhelmed by a wave of archæology. The great flood of illustrations which then set in has completely changed the methods of building design.

Formerly the designer was inspired by what he saw about him and worked only in a style which both he and the craftsmen, who worked with him, understood. The skilled mechanic knew the fashion in building just as the seamstress knows the fashion in dress, and needed only general directions from the master designer. It was not necessary for him to draw out, in full size, every detail. The workmen needed no such assistance. In some mediæval church one may find an indefinite number of capitals, bosses and other ornamental features all different, but all in the style of the time, each one the work of the individual, skilled mechanic to whom its making was entrusted. The master builder had simply to exercise a general supervision. Or to come nearer home and our own times—what exquisite bits of detail does one find in many a humble colonial construction done by some housewright or carpenter with no other assistance, in design, than that acquired through years of practice in the style of the time. But how can the mechanic of today be expected to be familiar with all the fashions of former times with which the modern architect decks out his work or disguises his construction?

The truth is that what passes here for architecture is a sort of archæological-architectural compound, neither architecture nor archæology though outwardly wearing the semblance of both.

Architecture is not constructed design and archæology takes account of more than the mere surface appearance of ancient buildings and monuments.

Architecture, in the historic meaning of the word, is beautified construction but what has construction to do with much of our "architecture" except to hold it up.

If we analyze the design of almost any one of our most popular buildings, what do we find? Not beautified construction but disguised construction. What meets the eye is constructed design, a sham. Most things about it are gross attempts at deception. Walls are not real walls; columns are not real columns and do not carry what they appear to carry. We see structural members which seem to support while themselves being supported: materials which are not what they pretend to be: features and motives which have no more meaning, so far as the internal arrangement of the building or its construction are concerned, than have the painted scenes on the stage of a theatre. When to all this is added an incongruous style of architecture evolved from some former method of construction with which ours has nothing to do, the thing simply amounts to a monumental humbug which, though it may pass as good architecture now, will sooner or later be condemned.

Except in a few bright spots, our national style is an architectural jumble, a heterogeneous mixture of abandoned fashions and false construction which would be comic were it not so tragic. Romanesque, Georgian, Colonial, French of all periods, Italian, Dutch, Renaissance and everything else, so far as outward semblance is concerned, carried out with modern engineering methods in defiance of reason or common sense.

We have been a hundred years building up this fabric, of which most Americans are very proud; but some day the truth will dawn on them and they will ask themselves why have all these old fashions and false methods; why not substitute therefor those simple laws of good taste which produced the beautiful things we now copy and adopt? Why have the pictured representation without the spirit, the husk without the kernel, the forms without the reasons for them? Can good art come of false methods? Can it be at variance with common sense? Can construction be divorced from design and the result be architecture? Is what we have so good that it should be continued?

If the change is to be made it should start from the foundation. It should begin in the schools. The pupil should be taught that good art must be based on common sense. That to be right a thing must be reasonable. He should know that every enduring masterpiece of architecture was strictly modern, in design and construction, when built and that the best copy or adaptation is of little value.

When one surveys our modern schools of architecture he finds that the plant is considered good in proportion as it abounds in the very things which have been most injurious to modern architecture, that is to say, in countless books, illustrations and photographs of buildings and styles of former times which have bred in the modern designer the desire to copy rather than invent.

Archæology is most useful and interesting if properly used, but destructive of art as we use it in our buildings and schools of architectural design.

Under the guise of architecture, archæology receives first place and, in one way or another, occupies most of the student's time and attention. When he graduates he is supposed to be competent to make good counterfeits of former styles and successfully to disguise or camouflage the modern method of construction so that it will not be recognized for what it is. Of the true principles of design he knows little and cares less.

What then would be a proper curriculum?

If the writer were to suggest he would say revert to those methods which in all past time have produced artists and enduring works of art.

The justification of the architect is architecture.

If the architect is not an artist what is he? If he is to act as a business man then he does not receive the proper training and cannot compete successfully with him who does. Already he has lost half the construction of the country and will fare worse if he does not return to his legitimate functions.

If it is admitted that architecture should be a fine art; that the architect should be first of all an artist; that present methods of teaching and practice have not produced satisfactory results; then the proper course in instruction should be apparent.

The way to make artists is perfectly well known and it is simply necessary to abandon present methods of teaching which do not make them, and revert to those which do.

The human form as it approaches perfection is the criterion of design and construction. It is the most beautiful object in nature and the most perfectly constructed object in nature. The study of its beauties has in all ages produced artists and the more intensive the study the higher the standard of art.

This then is the key to art. A knowledge of the beauties and refinements of the human form produces beauty and refinement in all branches of design. One has simply to consult the history of art to find this truth overwhelmingly demonstrated. Among the ancient Greeks; at the time of the Renaissance and at every other great art epoch, the enthusiastic study of the beauties of the human form was the most characteristic manifestation. Men who held that key could turn their hands to any branch of art whether of architecture, painting or sculpture with equal success.

This truth is so well known that it seems extraordinary that educators do not profit by it.

If the student is to become an architect in the true meaning of the term, that is to say an artist, then his chief concern should be with art, and how can he do better than draw inspiration from the fountain head of art?

No matter what else may be taught the major part of the student's time should be spent in drawing, modeling, studying and having expounded to him the beauties of the human form and their relationship to all branches of design and construction. That is the way artists have been produced in the past and it is the way to produce them for the future.

But it should always be borne in mind that although the human form may be the most beautiful object in nature, it may also, when misshapen, become one of the most revolting objects in nature, and between those extremes there is endless variety of ugliness: Art of the sort here discussed has to do with beauty only and the object of the student should be to learn art rather than anatomy, therefore the quality of the model is of the utmost importance.

Some time ago I was shown the work of students in a life class attached to a school of architecture. The professor said the students could not see the use of it, and as I looked at their work, I agreed with them. If the drawings resembled the models, there certainly was no use in it, for how can beauty be learned from ugliness or inspiration drawn from things devoid of it?

It has been asked, how can beauty be had in the small house if the owner cannot afford or will not pay a competent person to design it?

It seems to the writer that one way would be to change convention. The conventional small house is ugly. If the ordinary builder can be shown that it would be more profitable for him to adopt a different type and if that type was good looking a great step in progress would have been made. This the writer has tried to do in his book "Small Houses."

The chief trouble with the ordinary small house of today is that it has ugly proportions. It is too high for its base. In the work above referred to it is demonstrated that much may be saved in cost and gained in beauty by reducing heights, by certain methods therein described and illustrated. When this truth is realized perhaps the conventional type of small house will change for the better.

Still another way to help the process would be to improve the general standard of taste. This is apparently a formidable undertaking, but chiefly so because those in authority do not realize how easily it might be done if the right methods were used; nor how great would be the benefits.

If one tenth of the time spent in the schools in teaching things of little value to the pupils was spent in expounding the fundamental principles of design or laws of beauty, public taste would rapidly improve and with it improvement and increase in value in all products of labor.

In no other way can wealth be so easily created as in applying to all products of labor, dependent on design, the principles of good taste which result in beauty. No one will deny that beauty increases value and beauty may often be had at less cost than ugliness if one knows the rules which produce it.

We make a mystery of art, but there is really nothing mysterious about it. The true principles of design are so simple that a child may understand them. They are easy to learn, easy to apply and should be taught with the alphabet. If applied to design, the result will automatically be good.

The main principles of design as applied to construction are comparatively few and can quickly be mastered by any one of intelligence who will set himself to it. If the chief points as explained in the writer's book "Small Houses" above referred to, are grasped, he will at least know what is right and what is wrong and having that knowledge is nine points in ten.

If public taste were a little more elevated, vast numbers of people who now feel that anything spent in obtaining beauty is money thrown away would be willing to pay the competent designer and as beauty begets beauty, just as ugliness begets ugliness, conditions would rapidly improve. If the value of beauty were understood, improvement in the surroundings of buildings would also improve and the present abomination of ugliness which one sees here so often, in the suburbs of cities, would become as rare as in Europe.

The writer is well aware that his views will not meet general approbation. With public taste in the condition indicated by our architecture, it would be strange indeed if they did; but some will recognize the truth and he has the most abiding faith that this leaven, no matter how small, will, in time, pervade and elevate the whole mass.

# DESIGNING SMALL STONE BRIDGES

BY GILMORE D. CLARKE

*Member American Society of Landscape Architects*

LITTLE is to be found in books relative to the architectural design of stone bridges adapted for use in naturalistic parks and parkways. Most small highway bridges in this country are designed with only a utilitarian idea in mind; seldom does the architect lend a hand in the design of these structures, for the engineer assumes that art is not a consideration. As a result, we have the ugly concrete bridges which adorn our highways. W. Shaw Sparrow in his "Book of Bridges" says, "Railway bridges have been built in obedience to a brace of conventional arguments. It has been argued, first, that because traffic and trade are the main considerations, therefore art is not a matter to be considered; next, that because boards of directors have to please their shareholders, therefore a most strenuous economy must be advertised in a very evident manner, even although its results blot fine landscapes with the shame of uninspired craftsmanship." This is as true of highways as well as of railroads. Why is it not possible to make all of our state highways more like parkways by the use of art in highway structures?

What charm most European highway bridges possess; they were inspired by craftsmen and what a joy it is to study them. Stone bridges might easily surplant our concrete structures, or at least the worst of them, by facing the concrete arches with stone or by covering the flat lintel type with a wooden beam or log and the wing walls with stone. Probably this will never be done, leaving our only hope in the proper planning for the future. I take no issue with the designers of modern viaducts of concrete. Many possess beauty of line, of mass and even of detail,

West Elevation of a Bridge Over the Bronx River at Hartsdale
Gilmore D. Clarke, Landscape Architect

but of course lack the beauty of color and texture of the native stone.

It is intended here to discuss the problem of the architectural design of small stone bridges, such as are used in a well designed naturalistic park or parkway. Obviously, concrete does not lend itself for use as well as the native stone. One must not be led to believe, however, that the use of concrete is taboo in all landscape design, for parks and parkways. Parks and park drives near the ocean, where native stone is not available, are places where concrete, in carefully designed structures, may be used.

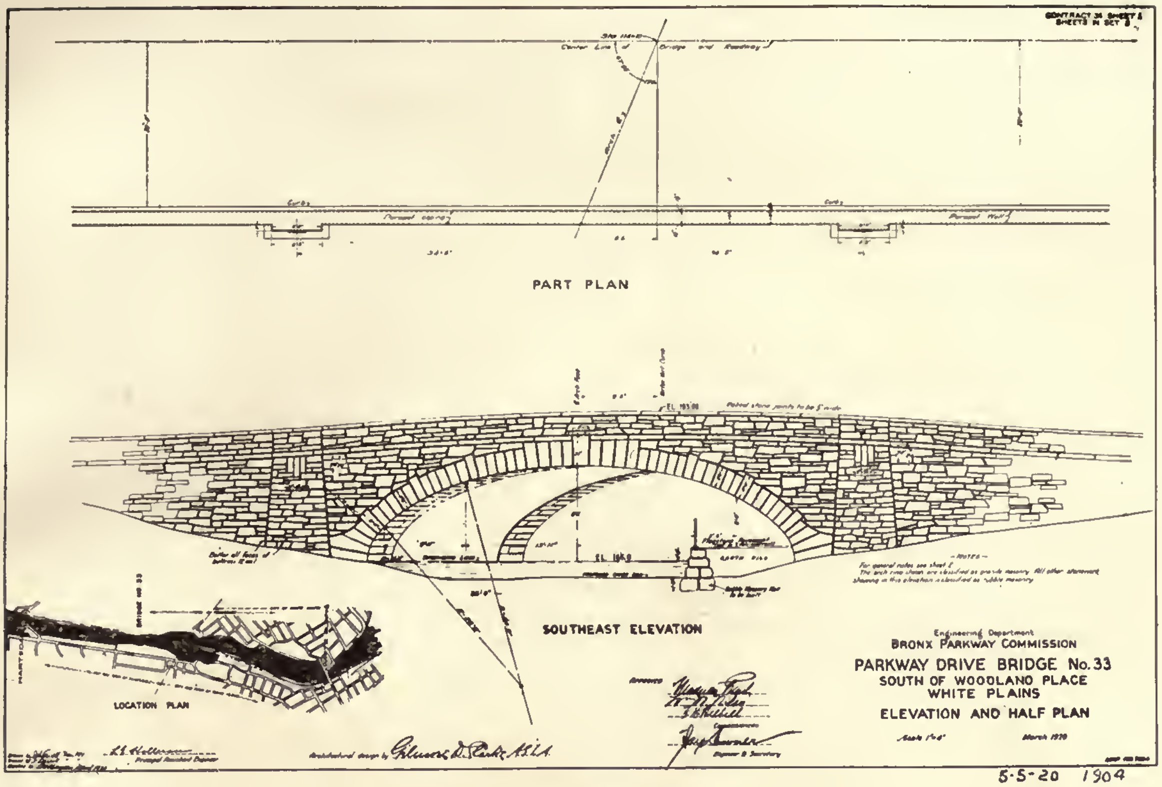
The possibilities for architectural treatment for the small stone bridge are somewhat limited. The close association of the structure with trees, land and water, prohibits the use of ornate design. Structures should be designed to become an integral part of the picture, a part of the natural surroundings, rather than being designed as a picture in itself. The designer must rely upon the line of parapet wall and arch for good proportion and beauty of outline. Long wing walls are monotonous unless broken with vertical lines of buttresses, which cast shadows to make an otherwise flat surface more interesting, and further to add a feeling of strength.

Many European bridges of the last century, particularly those of a single span, possess a decided camber. These are not well suited to automobile traffic, but in order to bring the charm of these old structures into our designs, we should where possible, retain a slight camber. Bridges may be made to appear to have camber by designing the parapet walls with a vertical curve. The appearance of the camber is then ever present even though the road profile may be flat. Camber on park bridges is more warranted than on the highway, and a long flat verticle curve in the road over a bridge gives one a pleasant sensation when driving, a feeling that a bridge is the reason for it. Small structures, those of a span of less than thirty feet, would be better if the drive over them maintained its natural gradient.

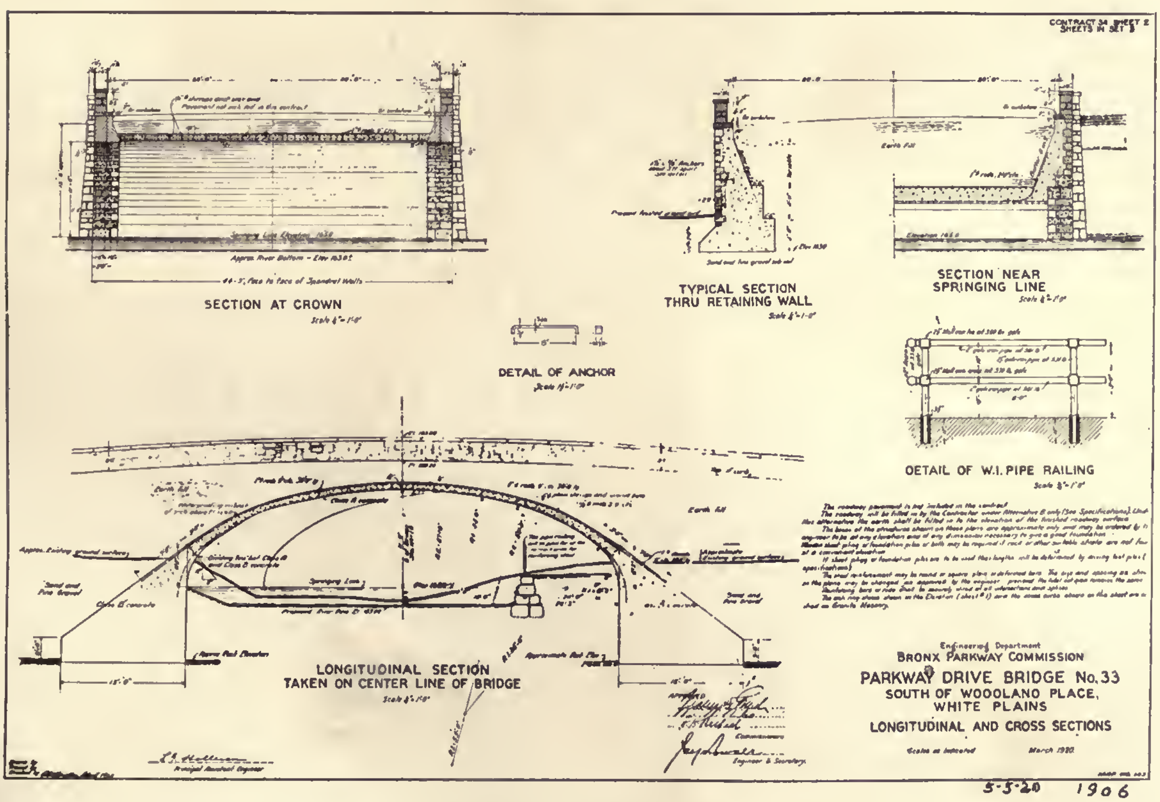

Sketch for a Proposed Bridge Over the Bronx River at White Plains
Gilmore D. Clarke, Landscape Architect

The design of the arch must, of course, meet the need of each particular problem. The elliptical arch, to my mind, is better adapted for use in small bridges than is the segmental arch. Where there is sufficient height above the springing line, a three or five centered arch may well be used. It possesses a more graceful line, causes the structure to appear lighter, for it allows a greater view through the arch. One has no alternative in cases where the span is long and relatively low; here in order to have a sufficiently strong arch the single centered or segmental arch must be used.

The detail of the stone work is a matter for the designer to have carried out under his own personal direction. So much depends upon color, texture, and proper jointing of the stone, that the resultant finished product depends upon good workmanship. Native stone is recommended, and weathered native stone is still more valuable. When weathered stone is used the finished work presents a feeling of age and the bridge blends with its surroundings and sooner becomes a harmonized part of nature's picture.




Gilmore D. Clarke, Landscape Architect




Gilmore D. Clarke, Landscape Architect

The bridges illustrated here give an idea of a few possibilities of bridge design for park purposes. It seems as though we should give more thought to the design of these structures, for bridges remain monuments of the ages. At this time when new parks, reservations, parkways and highways are being proposed there is an increasing demand for artistic bridges. Why should we not add a touch of the artistic to our highway bridges; why not add charm to our country highways by the addition of structures fitting to the surroundings, structures in tune with nature, rather than adopt the hideous concrete designs of the engineer, who seldom knows art?

The bridge designer must cause his work to develop in a manner that will leave his finished product a part of nature herself; bridges must be in close harmony with nature in color, in texture, in line, and in feeling. An artist who can design a bridge with these principles in mind cannot help but leave a work of art as a monument to his genius.


Sketch of a Proposed Bridge Over the Bronx River at White Plains
Gilmore D. Clarke, Landscape Architect

# ·EDITORIAL·COMMENT·

"BEAUTY," SAID MR. BURNHAM to the citizens of Chicago, "has always paid better than any other commodity and always will." He referred to Pericles as a political genius who knew how to perpetuate the prosperity of a city by enhancing its beauty. The *raison d'etre* of the profession of architecture lies in the plain statement that beauty pays. Were clients not in search of beauty allied to utility our cities would be sorry looking places filled with structures designed and erected by men who place utility and cheese paring economy above all else. Since clients do want buildings pleasing in appearance they employ architects; and architects after all is said are artists.

An artist, a real artist, is one who is master of the technique of his art and he who starts out to be a painter without knowing his materials and the effects possible to obtain with them, may paint all his life and dying be soon forgotten. He who begins life with aspirations to become a sculptor will end as a common stone cutter if he concentrates on the technique of stone cutting and neglects the technique of the art. If his creation does not compel men to halt and dream he is no sculptor.

So it is with the architect whose dreams drawn with meticulous care on paper and executed by skilled artizans are exposed to rays of pitiless publicity. If he knows the possibilities of all the materials entering into the structure, above all into the façade, and uses this knowledge wisely his future is secure. The technique of the art of the architect has changed little with the passing years. There has crept in, however, an increase in the demands of clients, and without clients even the best artists cannot live. Present day clients demand along with beauty every convenience and utility the fullness of modern life affords and the architect, the master builder, never more of a master builder than he is today, cannot hope to justify his position as a member of society unless he adds to his ability as an artist the skill of the engineer and the acumen of the business man.

So long as the artist gives evidence of ability to handle the multitudinous and multifarious details of modern building he is secure. His client, however, strictly limits the exercise of personal judgment to things essentially artistic; for materials, processes and equipment economic in kind and by nature he rightly insists upon decisions based upon easily enforceable standards. What does it benefit a man if he pays for beauty in design yet obtains a building containing defects which interfere with the earning of a proper return on the investment? An answer to this question goes far towards a solution of the problem of settling how a young man should be trained for the practice of architecture.

* * *

IT IS REGRETTABLE that disasters seem to be required to point lessons. During erection the steel work of the American Theatre in Brooklyn fell, causing seven deaths. Four years after the completion of the Knickerbocker Theatre in Washington, the roof fell, causing 98 deaths. Investigations resulting in a number of indictments which will be followed by trials, showed that in both cases the cause was the same; changes made in the design of the roof framing by the builders after the plans of the architect had been approved by the authorities. Perhaps the architects from the nature of their contracts with the owners were powerless to prevent the changes from going into effect. They were not, however, powerless to protect themselves by filing protests and disclaimers of responsibility with their clients; and also with the municipal authorities who are charged with the duty of enforcing the building laws.

Contractors are too prone to make changes after signing contracts. Architects are too complacent in their acquiescence in this practice. Nearly all reported accidents due to defective design or construction have occurred because of the substitution by the contractor of something which increases his profit, the while it disturbs the confidence of the client in his architect; in fact in all architects. The specifications may not contain the words "or equal" but every departure from the terms of the original contract shows the existence of the lack of confidence in his own ability that is implied whenever an architect descends to their use. Mutual confidence is the essence of all contracts and if clients are to have confidence in architects the latter must display confidence in themselves and their work. Firmness is a virtue, a proof of strength based on ability and lack of firmness has caused the ruin of many reputations.

* * *

OWN YOUR OWN HOME expositions seem to be out of place in the spring. It takes time to have plans fixed up to suit the owners, their families, relatives and friends, to obtain bids, let contracts, and, finally, to obtain materials. This requires months and labor has an uncomfortable habit of demanding higher pay early in the summer and then making itself scarce when it is most in demand.

These expositions belong to the fall months.

Contractors would like to arrange their work for the next year and a June bride should really move into her new house soon after the wedding. To wait until spring to present in alluring manner the felicities of home owning is a manifestation of procrastination, the great curse of humanity.

Fall planting and winter cultivation worked wonders in agriculture and the implantation in the fall of a desire to own a home, followed by sustained and judicious cultivation during the winter months of the instinct thus aroused, should produce a goodly crop of contracts early in the spring. Chicago reported the end of her exposition this week and during April the people of New York will be invited to leave their aggregations of cubicles and try the joys of living in detached houses.

* * *

THE LOSS OF TIME for labor in construction industries averages for all the trades about twenty-five per cent. Nearly all lost time is in the winter months when paralysis seizes building operations. Mr. Herbert L. Towle, of Philadelphia, is doing good work in making a study of why construction work is generally halted during the winter months, in the hope of being able to help change age-long habits.

Habit alone seems to be the reason for brisk and dull seasons in building construction. All year construction will be an accomplished fact when plans are made to keep on working regardless of temperature. The construction of manufacturing plants is not halted when winter comes and in every city work on the erection of commercial buildings keeps on within warmed enclosures because the loss of revenue during construction is counted as part of the cost. The warming of enclosures, and at times of materials, adds slightly to the cost, but appears to be offset by increased energy in the workmen who work with more vigor not only to keep warm but to keep their jobs. With proof from many places that good work can be done in winter it is plain that habit is an important factor in seasonal work in the construction industry. An analogy may be drawn from the conduct of war. In the Civil War all armies went into winter quarters and summer was the fighting season. In the World War one tremendous battle went on continuously, day and night, through all the seasons of the year. It was no longer "Thirty days of marching and resting with one day of fighting," as a famous tactitian wrote a half century ago. It is taken for granted by all soldiers that there will be no halt in operations in future wars and some of the larger contracting firms now say that "nor winter nor summer, rain nor sun, day nor night" will prevent the completion on time of work they undertake.

Unsettled costs aid habit because costs in general are based on seasonal conditions. For many contractors there is an element of gambling in figuring on work to be done in the winter time. It is necessary now for labor to fix rates of pay to cut down the twenty-five per cent. loss of time to ten or fifteen per cent.; contractors to cut down somewhat on profit to reduce overhead; manufacturers to make special prices on materials during the winter months; railways to reduce rates on construction materials. Costs will thus be stabilized and prospective builders may be led to feel they are approaching a bargain counter. When all the year building becomes a habit costs will be self-regulatory.

With experience and skill the "cold weather differential" in New England ranges from three per cent. to five per cent. of which about one-half is said to be labor cost added by cold weather. When each of the individuals contributes enough to bring costs a trifle below summer costs and owners are convinced that winter work will be of equally good quality, the battle will be won and a long step forward in the problem of unemployment will have been taken.

Co-operation between the interests involved can best be secured through architects. Owners should be urged to look upon every month as a good planning month and not to delay the release of plans until late summer with the idea of letting contracts in the spring. The movement for all year construction has received an impetus which cannot be wholly checked. The architect must now aid the builder who is willing to work every month in the year if he is given the chance.

APARTMENT HOUSE, NO. 635 PARK AVENUE, NEW YORK

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DETAIL OF PRINCIPAL ENTRANCE
APARTMENT HOUSE, NO. 635 PARK AVENUE, NEW YORK
J. E. R. CARPENTER, ARCHITECT

THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW
VOL. CXXI, NO. 2390 MARCH 29, 1922

APARTMENT HOUSE, NO. 550 PARK AVENUE, NEW YORK
J. E. R. CARPENTER, ARCHITECT

THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW

VOL. CXXI, NO. 2390 MARCH 29, 1922


DETAIL OF PRINCIPAL ENTRANCE

APARTMENT HOUSE, NO. 550 PARK AVENUE, NEW YORK

J. E. R CARPENTER, ARCHITECT

254[5]

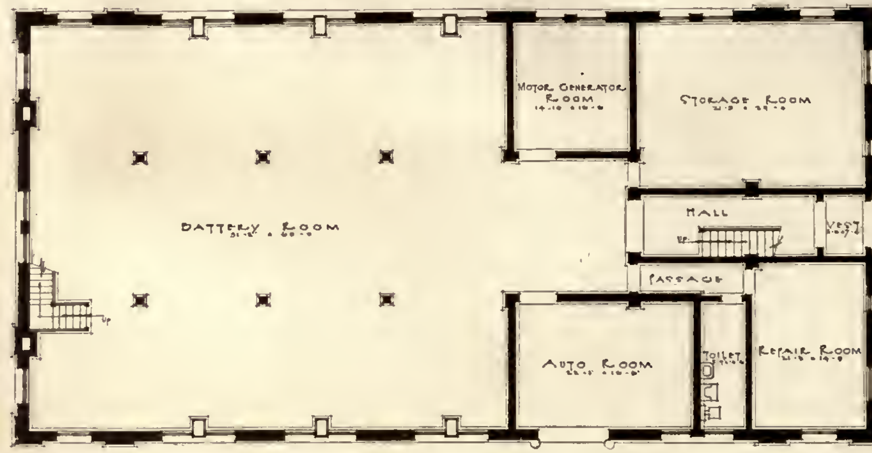


APARTMENT HOUSE, NO. 640 PARK AVENUE, NEW YORK

J. E. R. CARPENTER, ARCHITECT

(*See page 265 for typical floor plan*)

DETAIL OF PRINCIPAL ENTRANCE
APARTMENT HOUSE, NO. 640 PARK AVENUE, NEW YORK
J. E. R. CARPENTER, ARCHITECT





CENTRAL FIRE ALARM STATION, DETROIT, MICH.

DONALDSON & MEIER,

ARCHITECTS


STORE BUILDING, WESTVILLE, CONN.
BROWN & VON BEREN, ARCHITECTS

(*See page 266, for first and second floor plons*)

2549

254 10



AT TOP, GENERAL VIEW; BELOW, MAIN BANKING ROOM
BANK BUILDING FOR HINCKS BROS. & CO., BRIDGEPORT, CONN.
WALTER JOHN SKINNER, ARCHITECT
*(See page 267 for plans)*


DETAIL OF ENTRANCE
BANK BUILDING FOR HINCKS BROS. & CO., BRIDGEPORT, CONN.
WALTER JOHN SKINNER, ARCHITECT

MANTEL IN MAIN OFFICE

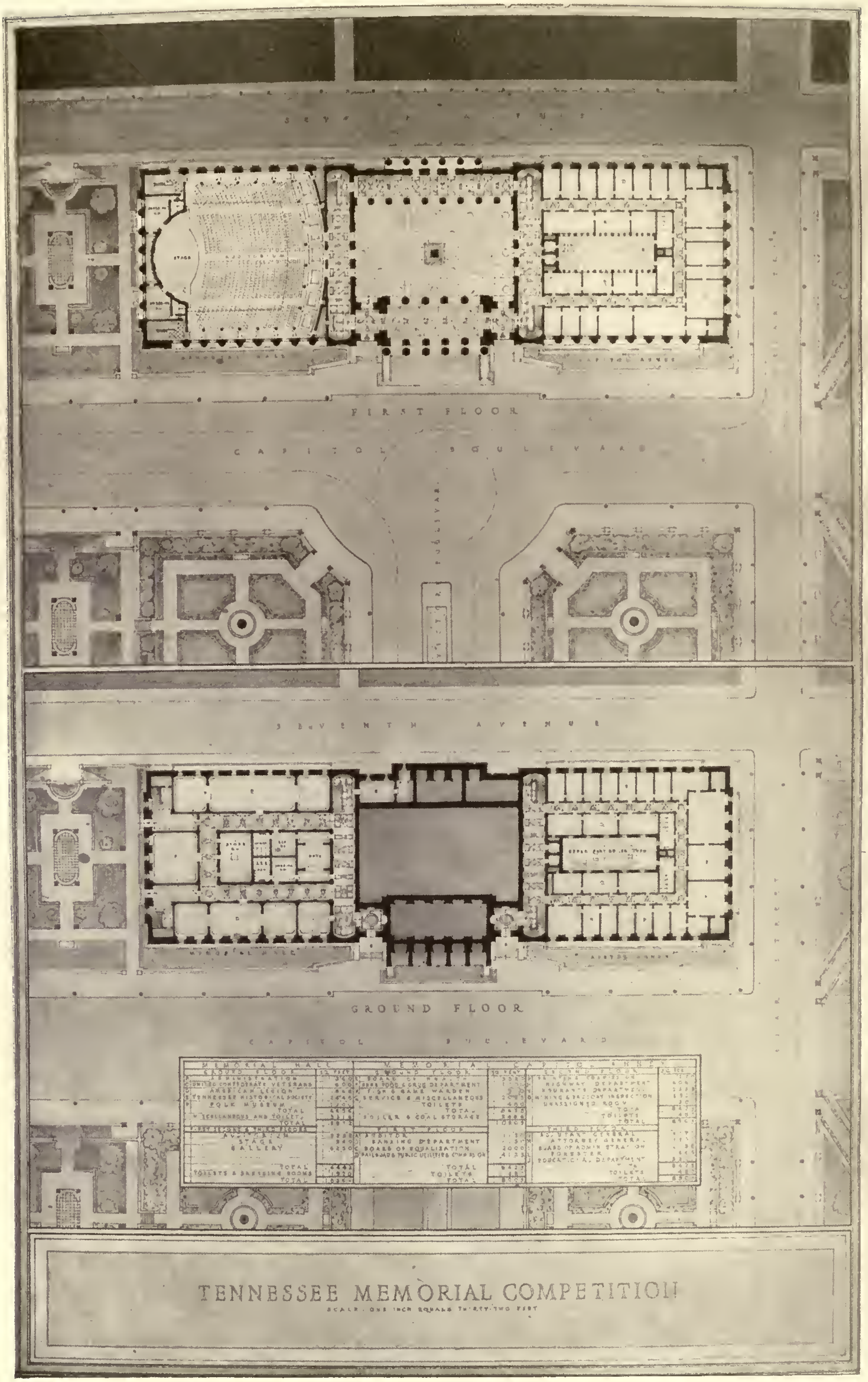
BANKING ROOM, LOOKING TOWARDS OFFICES

BANK BUILDING FOR HINCKS BROS. & CO., BRIDGEPORT, CONN.

WALTER JOHN SKINNER, ARCHITECT

2541/2

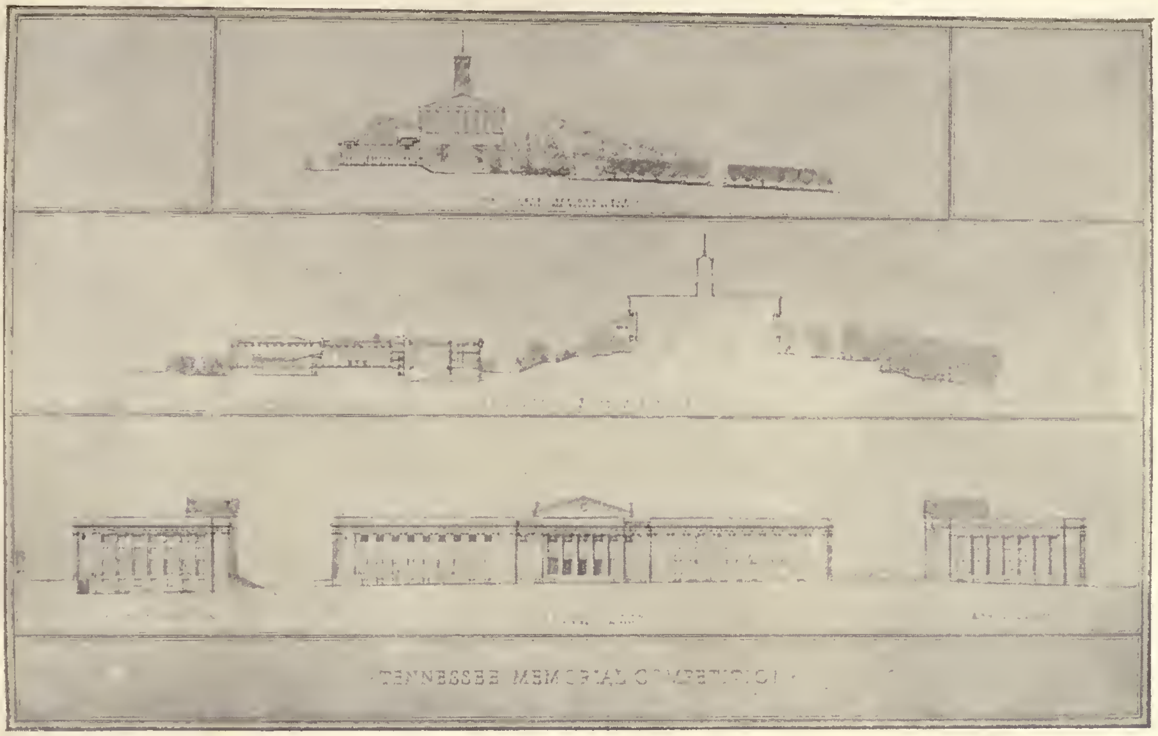

PRIZE WINNING DESIGN
TENNESSEE MEMORIAL COMPETITION
McKIM, MEAD & WHITE, ARCHITECTS

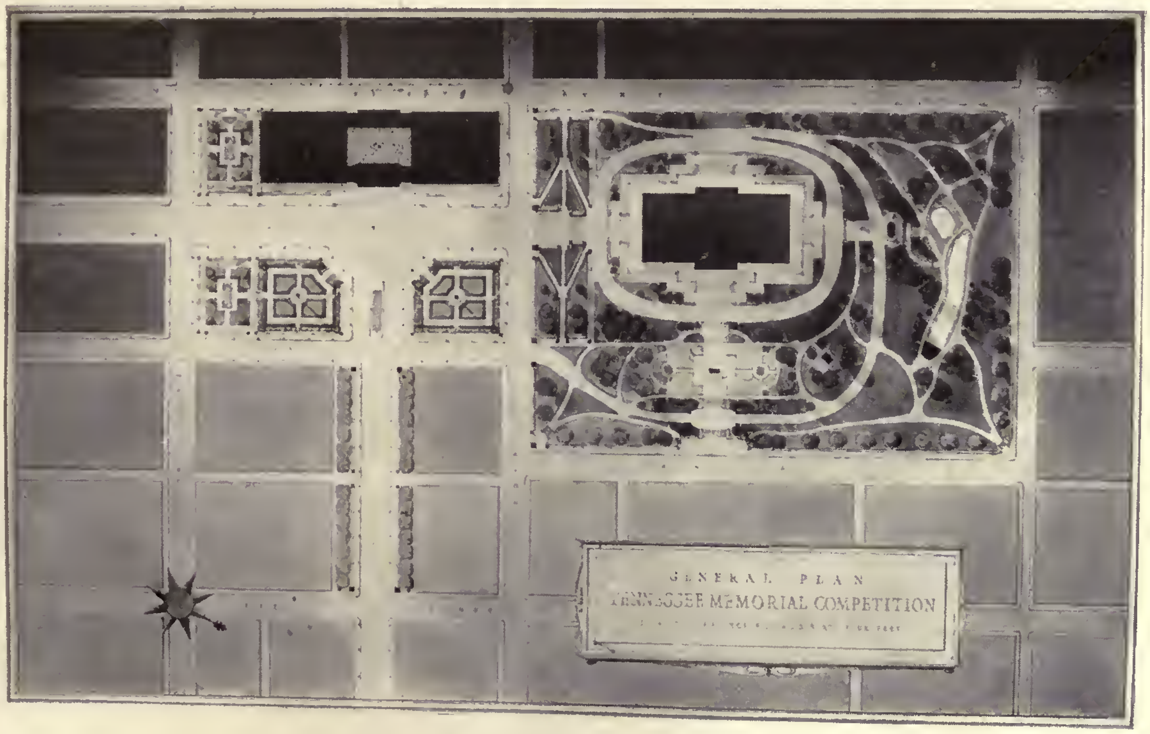



PRIZE WINNING DESIGN

TENNESSEE MEMORIAL COMPETITION

McKIM, MEAD & WHITE, ARCHITECTS





PRIZE WINNING DESIGN

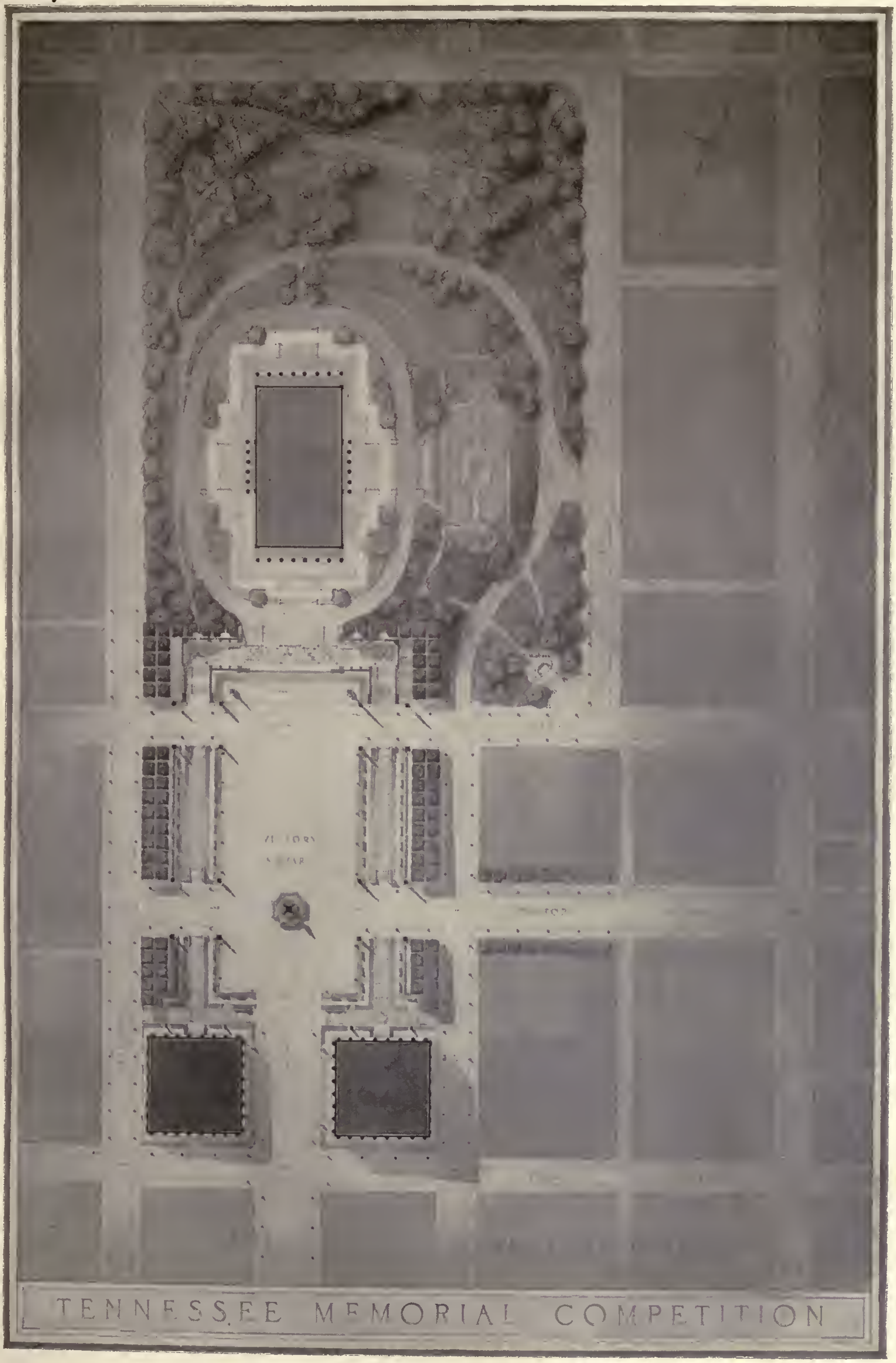
TENNESSEE MEMORIAL COMPETITION

McKIM, MEAD & WHITE, ARCHITECTS


2ND MENTION PLACED

TENNESSEE MEMORIAL COMPETITION

DONN BARBER, ARCHITECT

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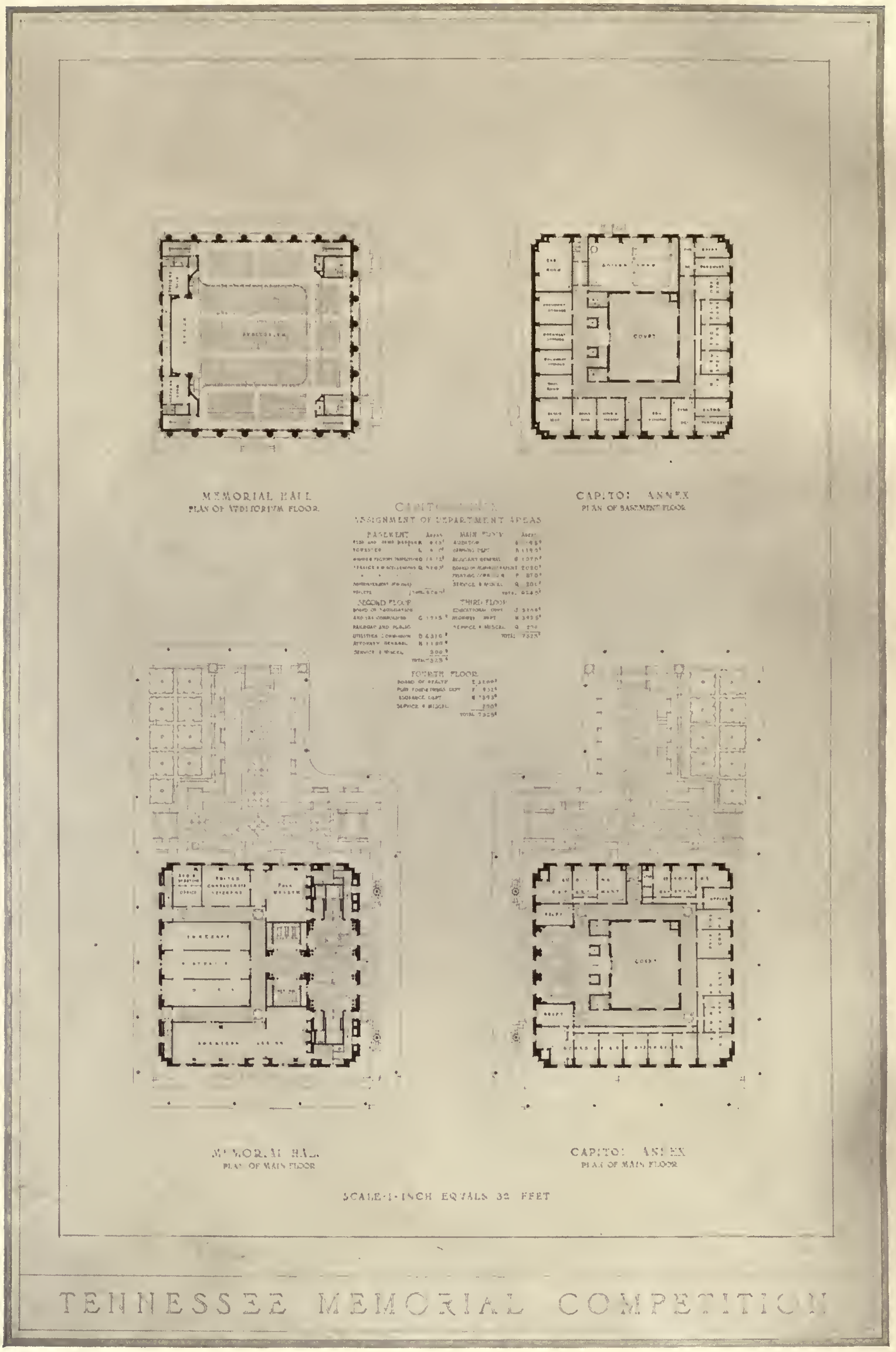
TENNESSEE MEMORIAL COMPETITION
DONN BARBER, ARCHITECT



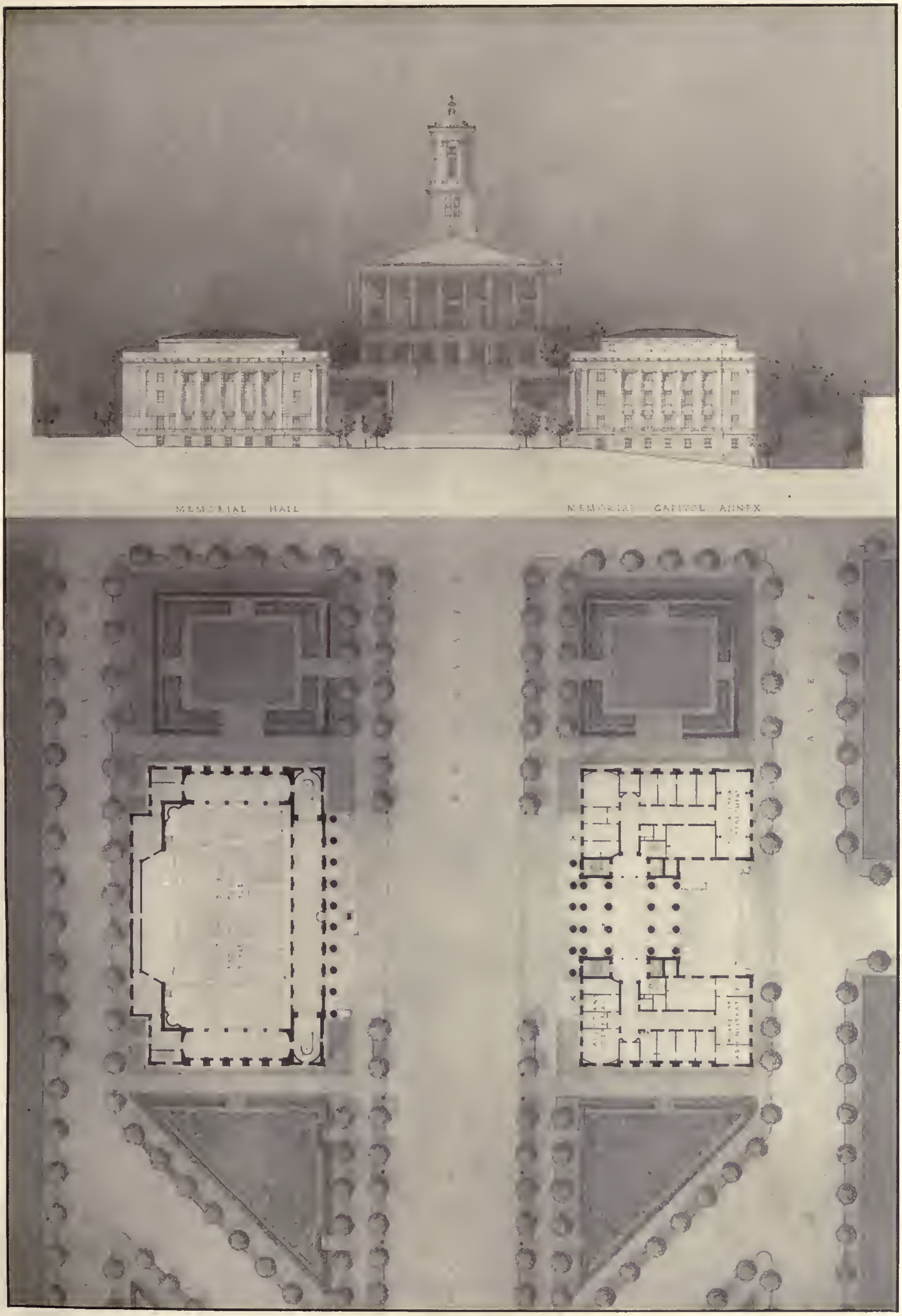

2ND MENTION PLACED

TENNESSEE MEMORIAL COMPETITION

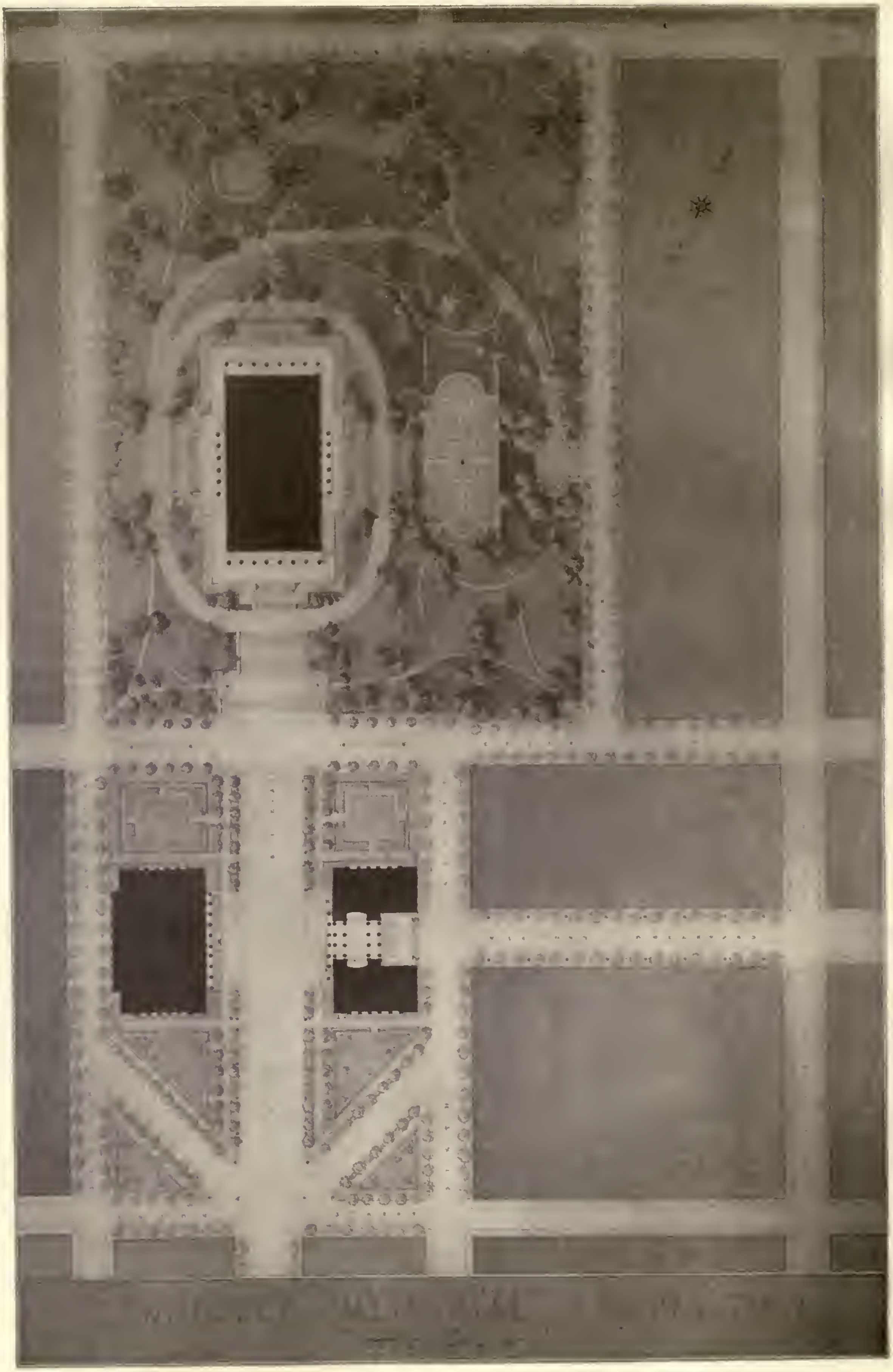
DONN BARBER, ARCHITECT

3RD MENTION PLACED
TENNESSEE MEMORIAL COMPETITION
ARNOLD W. BRUNNER, ARCHITECT

3RD MENTION PLACED
TENNESSEE MEMORIAL COMPETITION
ARNOLD W. BRUNNER, ARCHITECT




3RD MENTION PLACED
TENNESSEE MEMORIAL COMPETITION
ARNOLD W. BRUNNER, ARCHITECT



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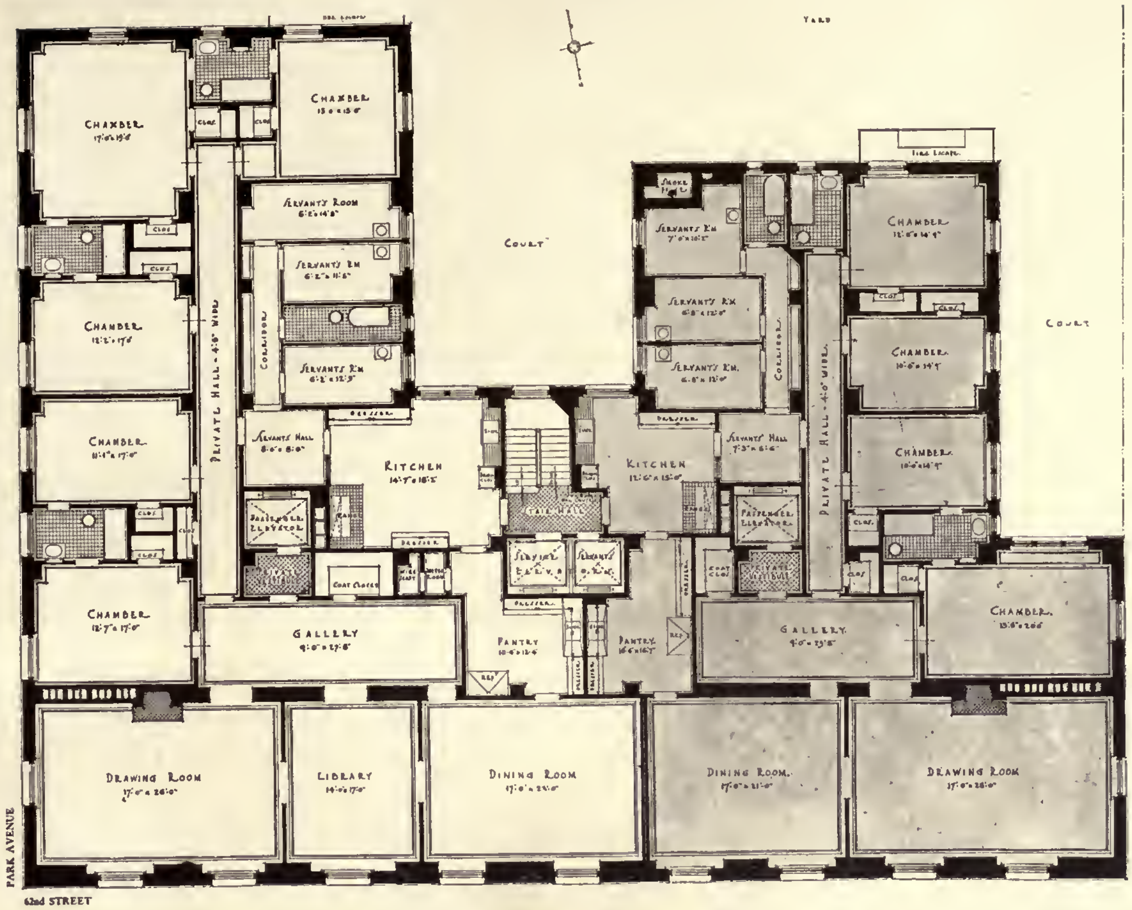
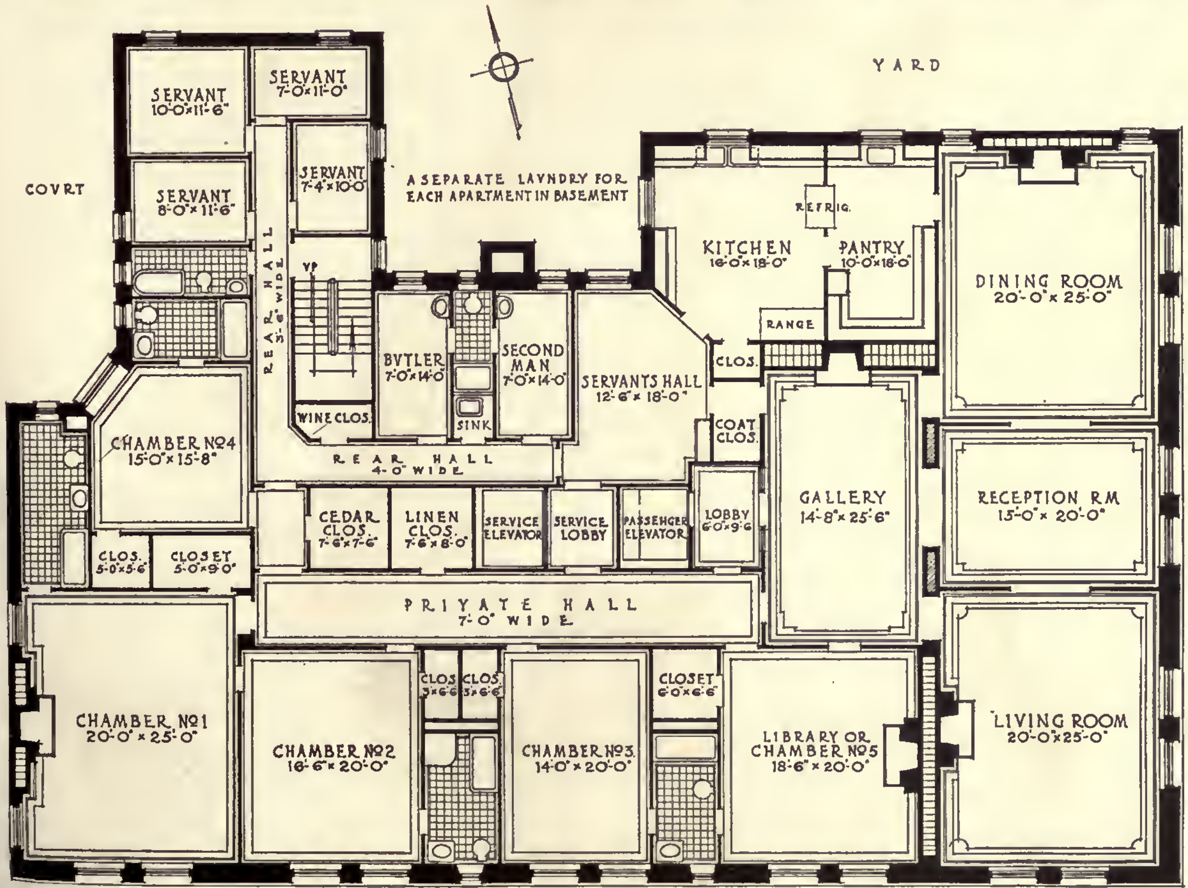
TENNESSEE MEMORIAL COMPETITION
ARNOLD W. BRUNNER, ARCHITECT

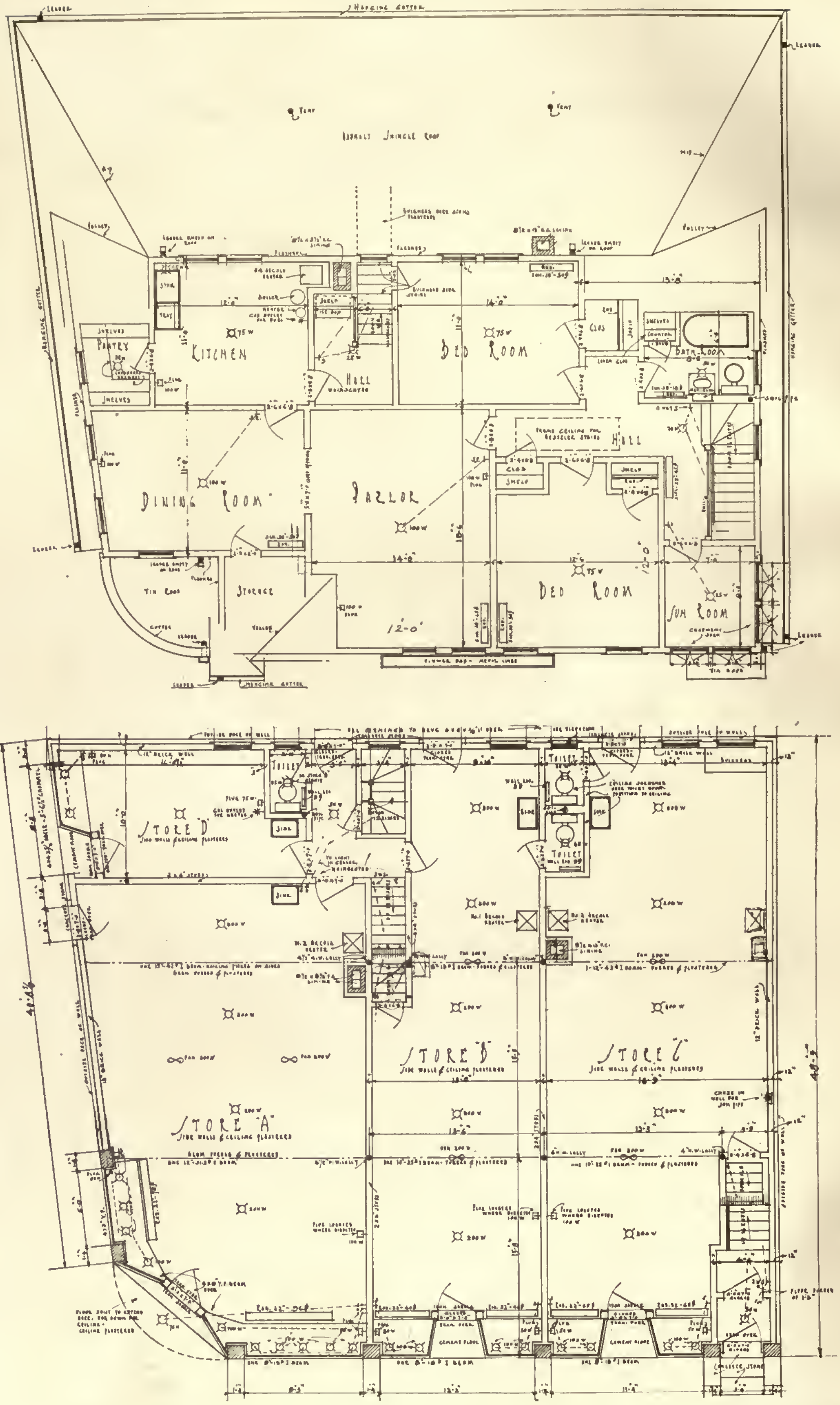



AT TOP, TYPICAL FLOOR PLAN, 550 PARK AVENUE; BELOW, TYPICAL FLOOR PLAN, 640 PARK AVENUE

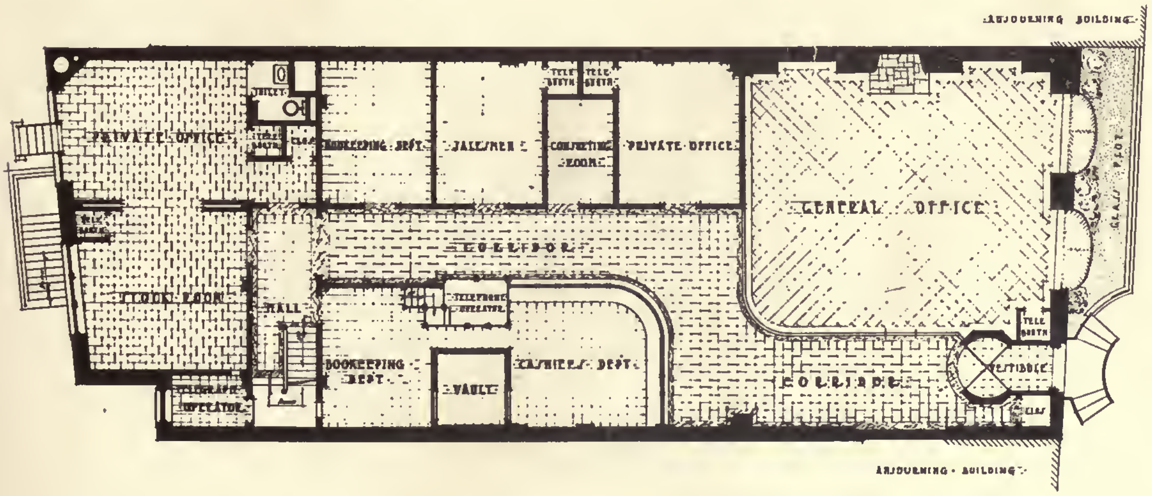
TWO APARTMENT HOUSES IN NEW YORK, J. E. R. CARPENTER, ARCHITECT

*(For exterior views see Plate Section)*




FIRST AND SECOND FLOOR PLANS
STORE BUILDING, WESTVILLE, CONN.
BROWN & VON BEREN, ARCHITECTS
*(For exterior views see Plate Section)*

TRANSVERSE SECTION




BANKING ROOM PLAN

BANK BUILDING FOR HINCKS BROS. & CO., BRIDGEPORT, CONN.

WALTER JOHN SKINNER, ARCHITECT

*(For exterior views see Plate Section)*

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

*JOURNAL of the Royal Institute of British Architects, January.* The ordinary run of book reviews are poor things at the best; they are given mostly to fulsome praise or violent condemnation, and are always apparently written with the presupposition that everyone has read the book. Usually few have read it, and no one else wants to after reading the review. But in this number of the Journal A. W. S. Cross, Vice President R. I. B. A. has written a review of Sir Reginald Blomfield's "History of French Architecture, 1661 to 1774," in which he frankly presupposes that no one has read the book; and, instead of dismissing it with a few words of criticism, he proceeds to give a very careful digest of what the book contains, with extracts from the text and with copious illustrations, and he makes it so interesting that everyone who has read his review will actually buy the book, or at least will want to. There is quite a detailed account of what is called the farcical competition for the completion of the Louvre, the commencement of the work by Le Vau, the visit of Bernini and the manipulations of Charles Perrault to secure the commission for his brother the doctor; all very interesting and well told. There is also a timely letter from Theodore Fyfe, F.R.I.B.A. on the proposed restoration of the Parthenon and the proposition advanced in the *Times* to restore the Elgin marbles to their former position, a ridiculous proposition which couldn't be carried out and shouldn't be attempted.

Our British brethren evidently take a great deal of interest in the Journal, as is shown by the numerous controversial letters which are published, and *mirabile dictu,* the whole affair is distinctly architectural and thereby a decided contrast to the pallid publication emanating from the Octagon.

From "The Architects' Journal," London

Projet for a Triumphal Arch to General Foch

*The Architects' Journal, London, February* 8. Our usual conception of an Englishman is a solid substantial person, conservative, sure and not easily carried off his feet by the whim of the moment. And when such sure-footed individuals do happen to get carried off their feet there is no half-way business about it; the thing is done with a thoroughness that is appalling. Just how sure-footed HdeC, who contributed an article on the Art of S. Noakowski, ever was, is open to question, but there can be no question that he has been caught in the undertow of Bolshevistic Modernism and is well beyond the life lines. We have never heard of S. Noakowski before, but he is alluded to in the text as Professor Noakowski and is apparently from Poland, and it may be that the horrors of that devastated country and the uncertainty of the solution of the Upper Silesian question have wrecked an intellect none too strong at best. We reproduce a little thing of his which he hopes will be erected in Warsaw as a tribute to Marshal Foch. "Covered" says H de C "with a profusion of detail it is yet ruthlessly simple. You can feel its weight on your mind." We do. "Even the letters in the word FOCH discover a sort of architectural simplicity which accentuates the riot of ornament breaking like foam on the crest of the arch;" and again "Hardly ever before has one seen on paper, or in a building for that matter, so keen a conception of the fundamentals in architecture." It seems that not only has HdeC lost his footing but he has dragged down with him the conservative editors of *The Architects' Journal.* We are quite accustomed to that sort of thing here in some so-called Art Magazines which fall over themselves in their eagerness to publish pictures apparently made by a feeble minded child of six, and to devote scores of pages in explaining the hidden message, and the singing notes, and so on, but it is discouraging to find that sort of rot creeping into the architectural journals.

As a welcome palliative there is also in this issue a very clever and amusing but entirely wrong-sided letter from Lord Knutsford on the proposed demolition of the city churches in London. It is a pity that space will not allow the reproduction of this letter and the editorial comment on it, as it has to do with a matter of great interest to architects here as well as in England. The churches of Wren and his followers are too precious a heritage for London to destroy lightly. We have had an example of that sort of thing here in the destruction of St. John's, Varick Street.

From the *Building News and Engineering Journal of London, February* 10, comes the announcement of the award of the Gold Medal of the Royal Institute of British Architects to Mr. Thomas Hastings of New York. This distinguished honor will be appreciated not only as a personal tribute but as a recognition of the profession at large.

*Journal of the American Institute of Architects, February.* Under the heading Shadows and Straws, the Editor commenting on the report of the Sub-Committee on the Form of Memorial to Soldiers and Sailors to be erected by the City of Boston, writes of what he terms the tremendous difficulty of memorializing anything or anybody in this age, and says "Of course the plain truth is that the only real memorials are those which lie in the hearts of men, and so far as modern times go it is difficult to believe that any message can be carried far in this direction by any of the arts. It is a pathetic conclusion, etc." It is a pathetic conclusion; pathetic in its utter hopelessness; pathetic in its lack of faith in the world as it now exists; pathetic in its lack of confidence in the men of today, and in the ability of some to produce that which will stir in others the feelings of patriotism and devotion. It is the old pathetic story that has been said so often in every age, pessimistic criticism of the present and shrill-voiced fear for the future. Against the proposal to erect a memorial to Washington there were many such voices raised in protest and in discouragement, and yet who will deny the beauty and the significance of that simple shaft? The Boston Committee did well to insist that their memorial should not be a utilitarian project, and there can be no doubt of their success.

The Journal publishes a series of pencil sketches by Louis C. Rosenberg, some of which are excellent; and there are the usual articles on Social Reconstruction, on the Guilds and some Sociological Implications regarding an Industrial Suburb, all rather dreary and unrelated to architecture. Among the letters to the Editor there is one by F. L. Ackerman in which he refers to a review of the Journal in a recent issue of this magazine, and which being written in the late Owen Tudor style is a little difficult to comprehend. A goodly portion of the letter consists of a quotation from an address of President Harding on the Production and Distribution of Farm Products. The little group of earnest thinkers is at least consistent in its inconsistency. If it is quite the right thing to devote an architectural magazine to the expression of socialistic views, why not devote a letter of criticism of things architectural, to the discussion of facts relating to the Production and Distribution of Farm Products? The little group quite approves of Mr. Harding, and are really very nice about it, although they acknowledge "they would have been more precise in the choice of words." A copy of this letter, engrossed or illuminated and sent to the White House, would be a delicate compliment and would throw a little ray of sunshine into the cloudy affairs of State. Mr. Ackerman also seems disturbed by the use of the term "pessimistic socialism" and wonders what it means; not objecting apparently to the socialism but to the pessimistic. The editorial already quoted might serve as an example of what was meant, and also the following sentence from a second editorial in the present issue, which at least cannot be termed enthusiastically optimistic—"Is there not here a lesson that really must be learned by a Democracy, which after all can do what it wills and which very likely cannot survive unless it wills to do better than it has done."

*The Architectural Record, February.* Leon V. Solon continues his article on Polychromy and deduces that "the presence of color upon any sustaining item of an exterior elevation tends to depreciate its appearance of structure and strength" and that the Greeks obeying this rule confined their color to the supported, decorative and applied portions of their buildings. There is always a temptation to try to discover definite formulas for things that cannot be reduced to formulas. Attempts have been made to reduce poetry to formulas. There are formulas for composition in music, in painting, in architecture and the Lord knows what. Mr. Hambidge has shown conclusively, to himself at least, that Greek temples were designed by a rope, and Greek vases were carefully drawn on something or other in direct elevation before being turned. Mr. Solon's formula is deduced from the fact that the Greeks painted certain members and did not paint others, and that this, therefore, must have been the result of logical analysis. On this point we cannot agree with

Mr. Solon. To our way of thinking the Greeks used color because it was an inheritance and because it was suitable to their climate and in conformity with their customs and chiefly because they liked it. All primitive races do. There can be no question of the wooden origin of their temple architecture, and with the traditional form they inherited the traditional color; and as the Greek entablature is an echo of the wooden prototype, so the color is an echo of the original earthen color daubed on the wood. If the Greek architect thought it would improve his temple to paint the columns pink with yellow spots he would have painted them pink with yellow spots, and never thought for a minute whether they were supporting members or not. He did not paint them because they did not need it; the shadows of the flutes were quite enough. He did paint the caps occasionally and surely these are as much supporting members as the shafts. It was natural enough to decorate the antifixes and acroteria, and the painting of the triglyphs gave richness to the frieze. Also it was considered the right thing; they always did it in the past; it was a convention, just as all Doric architecture was conventional. There may have been some religious significance attached to it. Now from an architectural point of view the use of color does not necessarily have a weakening effect on structural members. It is quite a customary thing to make the shafts of even large orders in colored granite or marble, and this certainly does not detract from their apparent strength. The Egyptians covered their columns with painted ornament and certainly the Egyptian column is not weak. No, the Greek polychromy was not worked out on such a system, or on any system except that of beauty and of convention, and this convention was generally adhered to because all Doric architecture was substantially the same; and the coloring was as uniform as the architecture. That the Greeks were right in adhering to this convention can be appreciated by an inspection of the Lincoln Memorial. Here is a large Doric order, treated freely, it is true, but comparable to the Greek temple in that it is not merely a part of a building; it is the building. If you stand in the peristyle and look up at the great expanse of white marble on the walls, the columns and on the coffered ceiling, you cannot help being convinced that the effect would have been finer had color been used. This feeling is increased when you go within the cella. The materials are rich and the scheme monumental but the effect is cold, almost unfinished. Until he had carefully studied the Lincoln Memorial, this reviewer was always sceptical as to the appropriateness of polychromy to classic work, and while he is not prepared to advocate it here to the extent the Greeks did it, he is convinced that more richness in color would generally be an improvement.

From "The Architectural Record"

Wing of the Driggs House, Waterbury, Conn.
Murphy & Dana, Architects

It gives us pleasure to reproduce from the Record a very charming corner of a wing of a house by Murphy and Dana. Frank Chouteau Brown continues his apartment house articles, and we notice on one plan that there is what is called an Orangerie adjoining a little turret or bay, in which is not a stair but a shower bath.

Lawrence Veiller asks "Are Great Cities a Menace?" and apparently thinks they are, and points to the Garden City as a way out, and shows how the wasted town of Welwyn can be and is to be made over into a beautiful modern town such as Letchworth. The photographs we herewith reproduce clearly show the great improvement.

The *February* number of *Architecture* has profuse illustrations of the Reconstruction of No. 1, Broadway, by Walter B. Chambers. This building was illustrated and commented on in the October 12, 1921, issue of this magazine and is a very skillful remodeling of an old building to new purposes—particularly as it was done without disturbing the tenants. The Booking Office is cleverly handled, and the inlaying of the conventional compass in colored marbles in the floor makes a motive that is decorative and appropriate to an office for the International Mercantile Marine.

Leslie W. Devereaux seems to consider that the "Condition of Modern Architecture" is similar to that of Rome, and that there is an individual tendency in modern design and quotes extensively from Viollet-le-Duc and Mr. Van Brunt's essay on the Discourses on Architecture by the eminent Frenchman, and arrives at the conclusion that construction is divorced from art, and architecture is a mere envelope, etc. It would seem from the article that Mr. Devereaux has a false impression of Roman architecture. The Roman was a practical man and a scientific builder it was true, but he was also a highly trained architect, and in his knowledge of architecture much further developed than the Greek. He carried the art of planning to an extent never dreamed of by those who had gone before and seldom equalled by those who have come after. There was an element of grandeur in all that he did and a breadth of feeling and an appreciation of composition that was remarkable; and his architecture was entirely logical. He knew how to build vaults for the support of his buildings and he knew how to design them so that they would have a monumental effect. His architecture was not wire lath and plaster hung from iron beams that had no relation to vaulting below. His vaults were real; the coffers were not only a decoration but part of the construction, and the ornament afterward applied was entirely incidental. The interiors were impressive without any decoration at all as we can easily judge from their ruins. With the Romans, therefore, art or rather architecture, was not divorced from construction; it was construction. There has been a lot of unintelligent criticism of the Romans because they used the orders as applied decoration. Of course they did; so did the Greeks; so did every nation who used orders. For an order is nothing but the artistic development of a point of support. The peristyle of a Greek Temple was not a structural necessity; it was an ornament, and it has been many times pointed out the order in its perfection is not a logical expression of anything in particular; it is a beautiful convention in stone of an original in wood. If we should ever start an application of pure logic to architecture there would be little architecture left.

And just as the Roman architect made use of construction and fitted his design to the construction and the construction to his design, so we suppose the modern architect should do with his steel frame buildings. The trouble is he usually does not know enough about construction to do it. He accepts the steel frame as an accomplished fact and covers it with a veneer. The new zoning law will prove a great help, and has already. The steel frame will be laid out by the architect and not by the engineer. What Mr. Devereaux has to say about the growth of an individual instead of a national or chronological style is probably correct. The development for the last fifty years has been largely individual and will probably become more so.

From "The Architectural Record"

Welwyn as It is

From" The Architectural Record"

As Welwyn may become

*The Architectural Forum, February.* Costen Fitzgibbon has a rather apologetic article on Baroque, Justice and Common Sense, which is interesting and well illustrated, and there are some measured drawings of Italian Iron Work by F. Nelson Breed, which are worth preserving.

Spokane is determined to be proud of her architecture and has appointed a jury to prepare a list of the most notable examples of architecture in that city, which has been done, and the findings are published in this number of the Forum. Our sympathy goes out to the jury. The Hutton Settlement House by Whitehouse and Price is good but we do not imagine visitors will be attracted to Spokane by the rest of the exhibit except perhaps to wonder why an architect should build for himself in this country a Swiss chalet, complete even to the stones on the roof. Under the heading of Decoration and Furniture there is an article on English Georgian Domestic Precedent which is well illustrated and there is a continuation of C. Stanley Taylor's article on Professional Charges.

*The Architectural Review, London, February,* has as a frontispiece, a colored reproduction of a spirited sketch by William Walcot and there is a very interesting article on Rye in Sussex, a quaint old seaport, now a seaport no longer, as the ungrateful ocean has receded some three miles and left it stranded in a marsh. The old houses that are illustrated might easily have been the originals of those clever drawings of Will Owen which illustrate the tales of W. W. Jacobs; and one can easily imagine the streets peopled with the characters he so vividly portrays. There is a short record of Saxon Survivals in the Smaller English Churches, and a sympathetic article on the work of the sculptor Antoine Louis Barye.

*The Architect and Engineer, San Francisco, February,* publishes the drawings submitted in a competition for St. John's Church, Los Angeles. To judge from the program the vestry were quite uncertain as to just what they wanted, but they say in large type that they are more concerned with the acoustics than with the style of architecture, adding however, that as the Mission style has been appropriated largely by the Roman Catholic Church of Lower California, they wish something that would suggest an Episcopal Church to the stranger as he passes. And with that idea doubtless in mind, they selected the scheme presented by Pierpont and Walter S. Davis, done in North Italian Romanesque, a style which everyone knows was never used by the Catholics. Perhaps it was the acoustics that influenced the jury. Allison and Allison have a rather interesting Gothic scheme but all in all the premiated design is probably the best, although one might wish that the transepts were lower and the roof or dome at the crossing was more prominent. The plot plan is cleverly arranged and the general effect should be excellent. It would seem from the drawings published that a large scale rendered detail was called for. This is nonsense in any competition, and tends to put a premium on draftsmanship. Not every office is equipped to produce such a drawing, and the temptation is to elaborate it unduly, and such a large drawing well rendered carries an unfair weight with any jury, particularly a jury largely composed of laymen.

Gate House, Eaton Hall, near Chester, England

*(From a Photograph by Robert M. Blackall)*

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## WHY BUILDINGS FAIL TO STAND

### A Review of Recent Building Failures and the Lessons they Teach

A GENERATION ago some buildings in a large eastern city fell with such fatal consequences that it was thought for several years that Buddensieck, the name of the builder, was to be a permanent addition to the English language to express shoddy construction, just as Colonel Boycott gave a name to express passive resistance.

Years passed and the name of Buddensieck was forgotten but pulling the wool over the eyes of building department officials continues to be a popular game with a certain class of men engaged in the building business. About four months ago there was a collapse of steel work in the roof of a theater building under construction in Brooklyn, N. Y., and seven men were killed. In the investigation that commenced very soon after the accident a judge was reported to have expressed great surprise that the plan examiner in the building department received a salary of less than $2,000 per year. "A man occupying a position of responsibility such as yours," he is reported to have said, "should have a salary of not less than $10,000 a year." All the blame was of course put on the man who had to examine the plans in order to see that the designer had not violated common engineering principles.

During the investigation which ended with charges of manslaughter against four men the newspapers from day to day reported interesting developments in the case. Not the least interesting was that the owner, who was doing the work himself without employing a contractor, actually had no permit for the work. The inspectors, according to newspaper reports, seem to think it nothing out of the way to discover buildings going up without permits and taking charge from that time. The reports indicate further that the owner submitted plans for the steel work to the examiner and they were rejected. These rejected plans, with some very slight changes, seem to have been put into a structural shop and were built. The examiner was apparently a hard man to satisfy but finally he approved of some plans, not knowing that the steel was already fabricated and partly erected. These facts seem to show that the underpaid man did all that could be expected of him. Had he alone been responsible there would have been no accident.

Investigation showed that the architect was employed merely to prepare the plans, the owners relying upon the city inspector to see that the work was done in a proper manner. The inspector was an "experienced building mechanic" without sufficient knowledge of steel work to know that things were not right. If he did possess such knowledge the accident could not have happened. The papers contained amusing stories of how the foreman of the steel workers shoved some loose pieces of steel under the end of a column in order to make it long enough to reach the truss it was to support, these pieces of steel being grouted in, as much to conceal the poor job as to level up the bearing under the column base. The lesson in this incident seems to be that plan examiners should be permitted to go out occasionally and assist the inspectors. It would seem to indicate also that inspectors and policemen who permit buildings to be erected before permits are issued are not good public servants. It would indicate that building department officials who are in the habit of granting temporary, or provisional, permits so contractors may proceed while plans and detail drawings are being made, should be retired permanently to private life. It would indicate also that architects, contractors, inspectors, policemen on the beat during the time buildings are going up, as well as the heads of building departments and their divisional heads, should be held strictly responsible to the public and to the families of victims, for all accidents that occur which may be traced to carelessness, if not to incompetency or dishonesty. Under the present unsystematic methods of handling such affairs the owner alone suffers. It is possible in the majority of cases to show that pressure from owners lies back of building accidents, but if the officials and the technically trained men were held equally responsible because of their supposed better knowledge, it would be impossible for owners to take chances.

The dust of the Brooklyn disaster was still clouding the air when the roof of the Knickerbocker Theater in Washington, D. C., collapsed with the loss of 98 lives. That it occurred on the night of a heavy snow storm is now generally believed to be largely coincident, for a failure was bound to happen some time. The snow load on the night of the disaster could not have exceeded an average of 15 lb. per sq. ft. and it is barely possible that this additional load may have been the proverbial last straw. The live load required for roofs in that city is 25 lb. per sq. ft., which means of course that a breaking load would be more than 100 lb. per sq. ft.

Reports received on the architect and engineer prove that they could have received licenses to practice their respective professions, had such licenses been required in the District of Columbia. The steel designers and detailers in the employ of the contractor were also competent and possessed of sufficient experience to have warranted them in being licensed. The most significant statement in the public press is that the steel framework for the roof was in place before the designers in the employ of the steel contractor were able to have their design and details approved by the plan examiners in the building department. If this is true it shows that the roof was not erected according to approved plans.

Fig. 1. Plan of auditorium of the Knickerbocker Theater, Washington, D. C.

The architect employed an engineer to design the roof framing; the plans, which called for plate girders and deep beams, were approved and the contract was let. The successful bidder for the steel work claimed it was going to delay him considerably to follow the plans of the engineer so he asked for, and obtained from the architect, permission to substitute trusses. The statement is made that the architect permitted the change subject to the approval of the new plans by the building department and that he did not check them himself nor ask any engineer to check them. Public reports further indicate that the first plans submitted for the change were rejected because of several shortcomings and more than one set of drawings found their way to the office of the plan examiner before final approval was given. The truth of the many statements printed will be brought out in the trials which will follow the indictment of individuals connected with the work.

The building was in use for about four years. This alone seems to prove that the accident was caused by an overload of snow. The most plausible explanation is that faulty details caused a progressive giving way which was not apparent because it was in the upper chords of the trusses and therefore no cracks appeared in the ceiling. Last summer, four years after the building was erected, the balcony was extended about 18 in. in order to permit the putting in of two additional rows of seats. It is reported that the steel supports of the balcony were not reinforced when this extension was added. The interior of the theater was then redecorated and if any cracks were seen they were not reported by the decorators. Investigators reported that one of the columns had a covering of mortar much thicker at one end than at the other and that this thickness was on one side. If this is true it would indicate that the column was not vertical and there are not wanting men who say that the plasterers told friends that the column was not plumb and they made it appear plumb by means of plaster applied where it would be most effective in concealing the faulty steel erection.

The Washington Star printed in the issue of February 6, 1922, an article by Mr. T. L. Condron of Chicago, who made an examination of the building. Mr. Condron stated that the investigation showed him conclusively that "accepted principles and practices of engineering" are not unsound, but that the neglect of the most elementary practices and principles led to the disaster. In another part of his article he said, "This theater is a startling example of how interior decoration and exterior beauty concealed faulty construction and gave a false sense of safety and security to thousands of patrons." He made no reference to the fact that this disaster gave an excuse to politicians to put many hundreds of needy supporters to work as inspectors to examine theaters now in use in many American cities. Similar examinations, with the class of men employed in the majority of cases, would not have revealed the dangers that existed in the building that failed and it was a sheer waste of public funds to make such farcical examinations to ease the public terror then existing. That many theaters were closed temporarily as the result of even such pretenses of technical examinations shows what a bad state of affairs must exist today in many buildings used for public assemblage.

Mr. Condron said the roof slab was strong enough to carry two feet of snow, thus effectually disposing of stories printed in some quarters with the intention of discrediting reinforced concrete. The cuts here presented are copied from those made by Mr. Condron to illustrate his report. Fig. 1 shows the general arrangement of the framing, the double lines representing trusses and the single lines the beams supported on the top chords to carry the roof slab. A suspended ceiling was attached to the bottom chords of the trusses. The north end of Truss No. 11 rested on the curved wall and the south end rested on Col. 2. The first item to criticize is the fact that Col. 2 ended at the ceiling level about six or seven feet below the roof and it was not stayed to the west.

Col. 3 extended to the roof and at the level of the ceiling a 10 in. I beam was put in to tie Col. 2 and Col. 3 together. It is stated that this tie was not a part of the original design. The three roof girders meeting at a point vertically over Col. 2 rested on a small vertical strut not connected rigidly at the base. This strut did not rest on the column but rested on the end of Truss No. 11 which was carried on the column. Fig. 2 shows these details and it is well to call attention to the fact that all connections in the field were made with bolts instead of rivets. Bolt connections may be safely used in many places but they should not have been used where they were in the roof under criticism. The vertical strut was connected to the truss by two bolts.

The connections at the ends of B-41 are examples of how such work should not be done. At Col. 3 the end of B-41 rested on a 12 in. channel which was not fastened to the column. When the shock came the beam pulled it over as indicated by the dotted lines. The west end of B-41 was connected by means of a bent plate which was bolted to a 10 in. channel attached to the insecurely fastened vertical strut above mentioned. The 10 in. strut from Col. 3 to Col. 2 was held in place by two bolts which attached a bent plate to the lower flange of the main truss.

No cap plate was used on top of Col. 2. On the underside of the truss resting on this column a groove had been worn. This was taken as indicating that deflections and temperature changes had actually caused measurable movement with corresponding wear at this point, where the reaction amounted to nearly 75 tons. The other end of the truss rested on a short section of beam to which it was not attached. The wonder is not that the truss finally slipped off but it is more wonderful that the roof stood more than four years.

Defects in the detailing claimed to have been found by other engineers showed that the upper joints at the ends of the trusses, and especially in the main truss, were not stiffened by cover plates extending over the joints, so that the gusset plates had to carry all the side thrust delivered to these joints. This would cause a gradual giving way which would affect only the roof members until the time arrived when an added "kick" would push the main truss off the wall seat and cause a collapse. This evidently happened, for all ac-

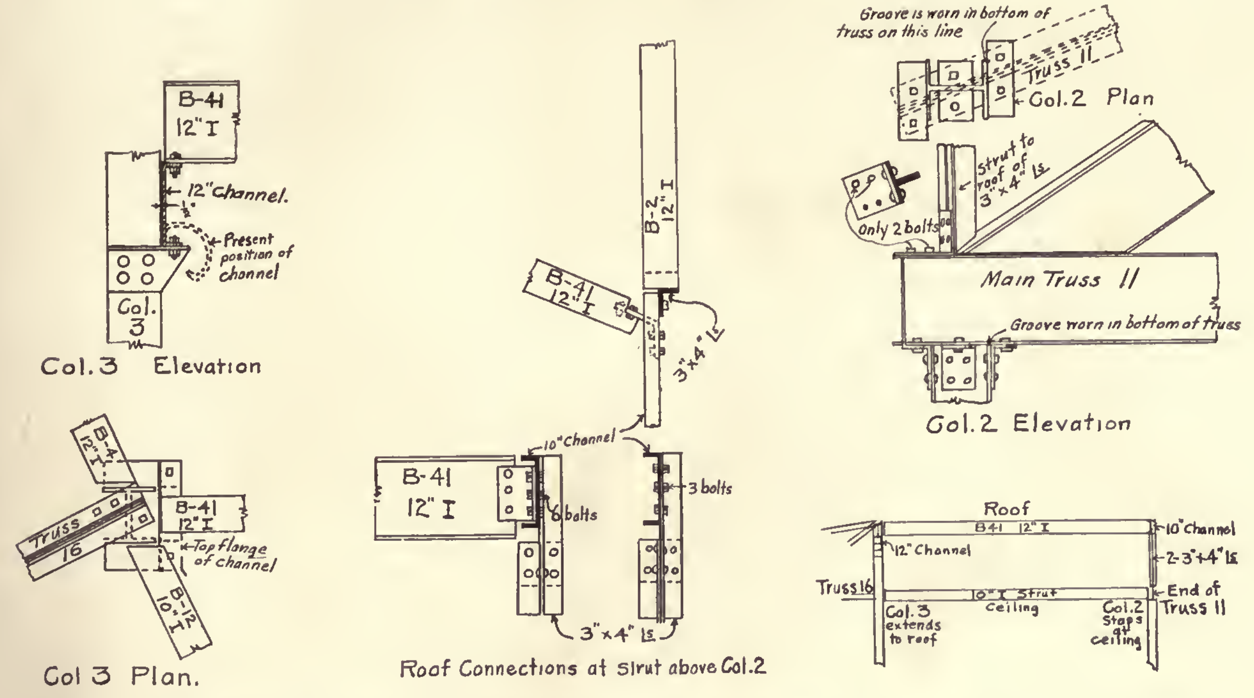



Fig. 2. Sketches showing some details which may have been the cause of the collapse of the roof of the Knickerbocker Theater

counts seem to agree that the first notice of the roof falling was when the end of the main truss dropped off the wall. The end of the truss should have been bolted to the wall or, better, have been supported on a wall column.

Mr. Condron criticized the bolting of truss No. 11 to the top of Col. 2 as it caused large bending stresses in this column, due to the deflection in the truss. Beam B-41 was overloaded yet it was poorly connected. Had this beam failed through overload it would have buckled sidewise, pulling the top of the channel on which one end rested, over until it collapsed. This would have caused B-41 to pull the vertical strut over Col. 2 towards the east. The 10 in. ceiling strut between Col. 2 and Col. 3 would restrain Col. 2 from falling in that direction, with the result that it would be carried south and slightly east, as was the case. This would instantly pull the main girder off its wall support.

The north end of the main truss was pulled off its bearing on the top of a twenty-inch I beam, that simply rested upon the wall, without tipping the beam over, which indicates a very sudden action. As this truss fell it did not scrape down the inner face of the wall, but cleared it entirely, showing that the movement was not toward the north, nor even straight downward, but toward the south. None of the beams or trusses were bolted to their wall bearings, from which they readily moved when the collapse began and the unstable condition of the two slender columns, Nos. 2 and 3, offered no resistance to the first crippling force, which Mr. Condron believes developed in the beam B-41. If the failure started by beam B-41 giving way then the heavy snow-fall caused the roof to fall.

The lessons from such failures are old lessons. An old Scotch chief draftsman had a habit of saying to his assistants, "Make it eye-sweet," and no job left his office until it had carefully been looked over to see that it looked right. It is a good plan to follow in all work. Merely bolting or riveting steel sections together is not sufficient; the proportioning of parts is all important. Connections must be rigid; beams and girders must be stayed so they cannot bend to one side or to the other. Columns must not be too slender and when trusses rest on the ends of columns the proper design is determined by the degree of fixity at top and bottom. Look the drawings over carefully and when in doubt make some computations. Take no chances. Tie the work together, or so design the joints, that they will resist forces from every reasonably conceivable quarter. Do not permit the steel contractor to substitute anything without the signed approval of the original designer, after he has had time to make a full check of the computations and drawings. Place no reliance on the ability of the average municipal inspectors and, above all, do not allow work to proceed until the building permit is issued after approval of drawings by the plan examiners. A copy of the building permit together with a stamped set of approved drawings should be kept on the job. Common sense is the most valuable asset a man can have and if the dictates of common sense are followed there will be no accidents.

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# ELECTRICITY IN THE HOUSE

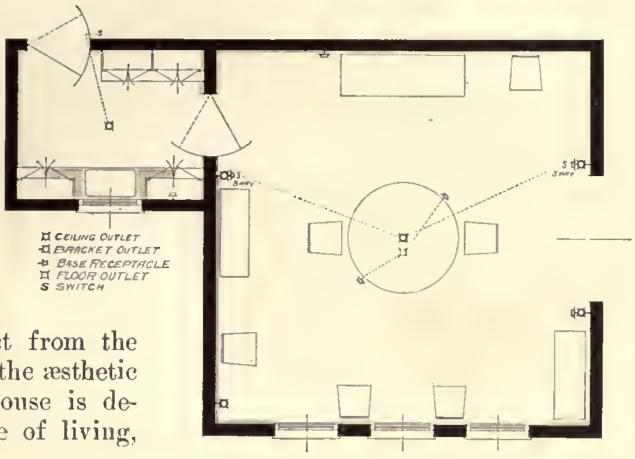
## III—THE DINING ROOM

BY M. O. WHITTEN

QUITE a few years ago, when living was in some ways less complex than at present, the writer can recall an applicant for position of cook, who demanded what was then considered a very high figure for her services. This, she explained, was because, in addition to her culinary ability, she was particularly skillful in carving, and expected to exercise that skill in her employer's behalf, "for I've found," said she, "that the more they pay, the less they'll do."

In the thought, if not the words of the late lamented Captain Cuttle, the point of this anecdote lies in the application of it, which in this case, is to the subject of electric wiring for the dining room, and the inadvisability of letting the wiring plan be too much affected by what may be only the passing fad of the moment. Thus, the tendency at present in the fashionable dining room, is to assume that wherever possible, carving and serving be relegated to the kitchen, and that accordingly, lighting need be provided only for the purposes of graceful conversation.

Thus, not so very long ago, the writer was shown the plans of a dwelling in a building designed to be the latest word in the modern, high-priced apartment. The large dining room was illuminated only by two double candle brackets, for, as was explained, "people of that class have only candles on their tables, and everything is done in the kitchen." Shortly after that, the writer happened to learn that a certain lady of ample means, living in this apartment, had betaken herself to a cooking school, to prepare herself for emergencies, because of the scarcity, uncertainty, and unreliability of cooks. As waitresses are also known to be subject to similar aberrations of temperament, the writer cannot help wondering if the owner of that same apartment would not be better pleased with a dining room adequately wired, so that confronted with a domestic emergency, she might be in a better position to meet it.




A dining room and pantry wired to minimize the discomforts of a home without servants

This brings us directly to the question of dining room lighting. Shall the architect conform literally to the present vogue of candle-lighting, or shall he view the subject from the practical as well as from the æsthetic standpoint? Where a house is designed for a liberal scale of living, the writer believes that a fairly satisfactory compromise can be arrived at, by omitting any central lighting fixture, but providing the necessary wiring, in case one should be wanted later on. This could be done very inconspicuously by having the needed small opening neatly capped over; or, better still, the small break in the plastering could be filled in, so that when the ceiling had been kalsomined, there would be no visible trace whatsoever of the wiring beneath, which, however, could be easily reached if occasion required it. Thus, should the family fortune fail, or a change of ownership ensue, or even, should fashion shift, it would be possible to install a central fixture with very little trouble and expense.

In selecting a dining room for the purpose of illustrating its proper electric wiring, the writer has been guided more by actual realities of household service at present, than by one's theories of the kind of household staff that would be maintained by a family in comfortable circumstances. In many ways, the designing of houses has been modified to meet present day living conditions, and it seems much better to admit it, and to furnish a wiring layout planned to supplement the shortage in the domestic labor market.

The dining room thus chosen as fairly typical of the modern, well-built house, is 15 feet square, and is lighted by ample window space on the south side. On the east is the broad entrance into the hall, and on the west, the door leading into the butler's pantry and kitchen. The north wall is unbroken. The furniture arrangement is conventional, with the table in the center, the sideboard in the middle of the north wall, the serving table placed against the west wall, and somewhat balanced by the china cabinet at the southern end of the east wall. Chairs are conveniently disposed.

It is assumed that the master of the house here does his own carving, and that he is assisted in so doing by adequate lighting, furnished by some desirable type of central lighting fixture; general illumination, however, is supplied by wall brackets placed on either side of the main entrance, and on the opposite west wall. Switches controlling the brackets are located at the right of the hall opening, while the switch for the central fixture is placed on the right of the door from the butler's pantry. Either the brackets or the central fixture should be controlled by a three-way switch, so that a person passing through the dining room in either direction can make a light on entering, and put out the light on leaving the room.

Convenience outlets are noted at several points; that to the left of the serving table suggests the use of a percolator, egg-boiler, toaster, or similar device at the serving table, at the hands of some deft servitor. The receptacle indicated at the left of the sideboard would permit the addition of electric candles to the general lighting scheme, and also provides a possible location for an electric radiator in cool weather. Vacuum cleaning can be conducted from this point also, or from the receptacle to the left of the hall opening; from this latter point of vantage, the cleaner could be operated in the entrance hall, and dining room.

Most certainly an electric floor outlet should be provided under the table; it may here be said that it is generally possible to bring the wire through an "invisible" seam in the rug, which usually can be split for an inch to facilitate the passage of the wire. But where this is not possible, a tiny aperture can probably be made by forcing apart the warp and woof of the rug with a pointed embroidery bodkin, thus avoiding any cutting of the threads. The writer also heartily recommends either the judicious wiring of the dining room table, or some other arrangement to make easy the plugging in of electric table appliances at one or more points; two table outlets are frequently advantageous. If the theoretical family could remain forever assured of the services of a waitress or butler, these outlets might be dispensed with in favor of side cooking at the serving table. Or, were the house built designedly for self-service, or for operation with a minimum of hired assistance, the receptacle near the serving table could be omitted, leaving the table outlets to provide for table cookery.

The plan also shows a butler's pantry or shelved passageway between the dining room and the kitchen, for which the electric requirements are very simple. Adequate lighting should be afforded by a single fixture, placed near the ceiling to avoid shadows, and switched from the kitchen. One receptacle is provided for the silver buffer, toaster, or for use of an electric platewarmer.

Many house plans drawn nowadays bear mute witness to the scarcity of "domestic employees" by calling for an additional "breakfast room," "kitchen nook," or "breakfast corner." The name may vary a little, with the location of the room, or the amount of space involved, but the fact remains the same; architects are frequently asked to provide some small informal dining place, where the mistress of the house can readily and quickly serve a small, informal meal. There is no need of especially depicting such a room here, since the same principle of electric wiring holds good for this, as for the larger dining room. Lighting will be very simple, and will be supplied either from a small central fixture, or a wall bracket, depending on the position chosen for the "nook." But in the very nature of the case, ample receptacle facilities should be reckoned on, as self-service will evidently prevail here, and table cookery will be at a premium. It may well be that a leaved tea-wagon will take the place of the larger dining table, in which case it would probably be advisable to have the tea-wagon wired for the purpose.

### Fee due Architect for Extra Cost

UNDER date of February 27, 1922, the United States Supreme Court handed down a decision in favor of Eames and Young, architects of St. Louis, upholding a decision in the Court of Claims from which the United States had appealed.

Eames and Young made the plans for a custom house at San Francisco and supervised its construction. The contract provided that the fee of the architects was to be computed at the rate of five per cent. upon "the actual cost of the work executed from the drawings and specifications, as shown upon the books of the Supervising Architect's office, by the net amounts of contracts awarded and proposals accepted for additions and deductions."

There was a delay of three years due to the San Francisco earthquake and fire with an increase in the cost of labor and materials. Congress awarded the contractor the sum of $101,907.66 as an extra payment to cover the increased cost. The claim of the architects for five per cent on this amount was denied. The Government contended that the amount awarded to the contractor in addition to his original contract price was a gratuity and could not properly be treated as part of the cost of construction contemplated in the contract.

Mr. Eames died and Mr. Cook, his executor, joining with the surviving partner, Mr. Young, brought suit in the Court of Claims, obtaining a judgment for $5,085.33, which may now be collected.

### Court of Appeals Sustains Zeolite Water Softener Patent

THE U. S. Circuit Court of Appeals, Second Circuit, N. Y., rendered an opinion on February 14, 1922, affirming a decision previously handed down by the Federal Court at Buffalo, N. Y., that sustained a patent owned by The Permutit Company, covering zeolite water softeners. According to this decision all zeolite water softeners on the market not manufactured by them, are an infringement of this patent.

Zeolite is a generic name of a group of hydrated double silicates in which the principal bases are aluminum and calcium or sodium. Among anhydrous silicates they are closely allied to the feldspars.

### Individual Liability for Preventable Fires

THE Massachusetts legislature, says *The N. F. P. A. News Letter,* is now considering a bill to fix the cost of extinguishing fires upon persons disregarding fire prevention orders. The Chicago City Council is considering a similar measure in the form of a city ordinance. Cleveland and Cincinnati already have such an ordinance.

Fire losses are increasing so greatly in the United States as to excite apprehension. Much of this is due to the item of "Moral hazard," the name given by insurance adjusters to the habit some people have of regarding a fire insurance policy as a cash reserve which may be drawn upon when times are hard. Some fires occur because tenants notoriously are less careful than owners, and an increase in the number of home owners will reduce this class of fires. Of still another class of fires a recent bulletin of the National Lumber Manufacturers' Association has the following to say:

Looking back over the years the degree of carelessness of the occupants of buildings seems to have increased in proportion to the added degree of fire protection. A residence built of materials that will not readily burn increases the occupant's negligence and general carelessness.

In this connection, the opinion of one whose daily contact with the fire problem in a mid-western city should be interesting. Daniel F. Shire, Chief of the Fire Department at the Rock Island Arsenal, Rock Island, Ill., in a statement which appeared in the March, 1922, issue of *"Fire and Water Engineering"* said:

"The only persons who can prevent loss by fire are the owners and occupants of the premises—upon them rests the responsibility of loss in nearly every fire."

The high esteem in which wood as a building material is held by those who have a thorough knowledge of the conditions, is shown in another statement by Mr. Shire in the same magazine. He says: "Fire-proof construction means nothing to you if it is not safe construction. I would rather go up against good safe mill construction than the so-called fire-proof building any time, and so would you."

In many countries the cost of extinguishing fires is put upon the persons found to be responsible, following a searching inquiry into the cause. The damages paid cover the cost of the investigation as well as cost of police protection during and after the fire, the amount of water consumed and the time required of public employees because of the fire. In addition all sufferers by the fire are entitled to collect damages from the culpable individuals, who are also from that time regarded with suspicion by landlords and insurance companies. The relatively small per capita fire loss in Europe, compared with that in the United States, is believed to be due more to such laws properly enforced than to better construction of buildings, for no proof has yet been adduced to show that the average house in Europe is superior in construction details, or materials, to the average house in America.

## The 660-Watt Rule

A HEARING open to all parties interested will be held in the assembly rooms of the Chicago Board of Fire Underwriters, Insurance Exchange Building, Chicago, Ill., beginning at 10 A. M., Tuesday, April 18, 1922 to discuss the 660-watt rule. It is the present plan to arrange for a second public hearing, probably in New York City, on or about May 15, 1922.

The 660-watt rule is largely a relic of past conditions, when carbon lamps, consuming approximately 50 watts for 16 candles, were used and when branch circuits were limited to six amperes, equivalent to 660 watts at 110 volts. Fuses in branch circuits may now be ten amperes for 125 volts or less, and six amperes for 250 volts, permitting in effect 1250 watts on a 125-volt circuit, or 1500 watts on a 250-volt circuit.

With the great increase in the number and variety of attachments, such as electric washers, sweepers, irons, heaters, large lamps, etc., there has come a pressure for permitting a larger wattage on branch circuits. These devices frequently are connected on the same circuit with lights and, drawing five or six amperes apiece when the lights are on, often exceed fuse ratings and blow the fuses. The result is that wires, pennies or other devices are resorted to to bridge the fuse gap and the circuit is often-times worse off than if higher fusing were permitted.

The Chicago meeting here mentioned will be in charge of Mr. A. Penn Denton, 17th and Oak Sts., Kansas City, Mo., and Mr. A. R. Small, 207 East Ohio St., Chicago, Ill., members of the Standing Committees on Devices and Materials and on Wiring Systems and Standards of the Electrical Committee of the National Fire Protection Association.

It is hoped that readers of THE AMERICAN ARCHITECT, all of whom are interested in this important question, will express their views regarding the proposal to change Rule 23 d and related rules of the National Electric Code covering limitations upon maximum loads of branch circuits. The Committee wishes to receive written communications from those interested who cannot attend the meeting.

## Notes on Materials of Construction

THE National Lime Association, Washington, D. C., brings out this month two more bulletins in the educational series, known as Lime Briefs.

Lime Brief 251 is said to be the first publication of its kind undertaking to summarize completely all of the uses of lime, and to present that summary on a functional basis, grouping together under various headings the uses that depend on the same chemical function.

The publication covers the agricultural, chemical, and construction fields, and is well enough written to interest the general reader. Included in the brief is a comprehensive chart giving a bird's-eye view of the entire subject.

Lime Brief 265 presents an outline of the fundamentals in the textile industry with particular attention to the processes involving the use of lime.

The Structural Materials Research Laboratory, Lewis Institute, Chicago, Ill., has issued Bulletin No. 10, entitled "Wear Tests of Concrete." This bulletin is a reprint of a paper by Professor D. A. Abrams which was originally published in the *Proceedings* of the American Society for Testing Materials, Vol. 21, 1921. The discussions which appear in the *Proceedings* have been omitted; a summary has been added which was omitted in the original publication.

Professor Abrams concludes that the wearing resistance of concrete is determined largely by the *quality of concrete* rather than by the type of aggregate. Good concrete can be produced from aggregates which are generally considered inferior, if other factors are taken into account. In general the factors which gave concrete of high strength also gave tough concrete. These factors are: plenty of cement, exactly enough water, grading to secure large proportion of coarse aggregates, long mixing, curing under favorable conditions.

### Wind Velocity and Radiation Losses

AT the Annual Meeting of the American Society of Heating and Ventilating Engineers, held in New York City, January 24-26, 1922, an interesting paper was read by Mr. W. L. Fleisher on "The Effect of Wind Velocity on Radiation Losses and Inleakage."

He stated that the Standardization Committee of the Heating and Piping Contractors' National Association had accepted the b.t.u. transmission factors obtained by the late John R. Allen, for radiators and pipes and now are trying to obtain proper factors for varying wind velocities. These factors will determine two things now practically guessed at in all determinations of radiation losses; first, inleakage or air changes, and secondly, exposure coefficients. The committee members decided that both are factors of what may be termed a "wind variable." "Probably everyone," said the speaker, "allows a factor of safety for different exposures, such as 30 per cent. additional for a north exposure added to wall and glass of that exposure, down to 5 per cent. for southern exposures or sometimes no additional amount at all. These factors, the product of experience, are very crude and take care of inleakage as well as transmission. As far as inleakage or air change is concerned, we say for this room one-half an air change, for that, one air change and for that other, two air changes, depending on the number of windows, doors, flues, corridors, elevators, stairways, etc., influencing the inleakage of the particular room in question. I am afraid we shall always have to add a factor of safety, even if the problem is thoroughly worked out in a research laboratory because the factor of care of installation and of the materials of construction is in the hands of the workman on the job, a factor that can never be determined in a laboratory. Still we have already gotten to the point where we can say inleakage is a factor of the lineal foot of window crack, the type of window and the wind velocity. We also can say that the $K$ of radiation is a factor of wind velocity as well as temperature, and by temperature, I mean both dry and wet bulb."

The deductions of Mr. Whitten from observations made at Harvard Medical College in 1910 were published in 1912. In 1915 Messrs. Whitten and March modified the previous deductions but not enough to affect the main data.

In 1916 Messrs. Voorhees and Jones tested the inleakage through window cracks under varying wind pressures and established the fact that it varies with the wind pressure or velocity. The research laboratory has carried on tests to determine inleakage, which show it to be a direct factor of wind velocity. These tests will be continued for some time to obtain usable factors.

Mr. Fleisher described some independent tests in his own laboratory and concluded that nature has been very kind to the heating engineer by tempering the wind to the temperature. In other words, while it is now known that wind velocity is as important as temperature, the wind velocity as a rule decreases as the temperature falls. In his computations he found that as the temperature fell to what he called the danger point, the additional computations required for the assumed wind velocity at that temperature about balanced the difference between the minimum assumed temperature and the actual temperature with the assumed wind velocity. Danger of insufficient radiation was obviated by the usual factors of safety employed, a somewhat unsatisfactory condition of affairs which will be remedied as data accumulate.

# THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago, Ill.



*The American Architect and The Architectural Review has gratuitously set apart this section for use by The American Specification Institute.*

*The Editors and Publishers assume no responsibility for any statements made, or opinions expressed.*

*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review.

### Spring Conference

The Spring Conference will be held in Chicago on the evening of April 21. The subject of this Conference will be Painting—For Structural Steel, Wood and Plaster.

A number of the members have sent in inquiries or comments respecting specifications for paint and varnish finishes and, in view of the general impression that many complications may easily arise in the preparation of specifications for, and the execution of, paint and varnish finishes it is believed some progress may be made toward the formulation of a bulletin covering this subject.

The speakers of the evening will be a painting contractor and an engineer who has made a study of steel protective paints. No representatives of manufacturers or dealers will be permitted to attend as it is felt that with such men present the discussions may follow channels of thought that would only tend to confuse the audience. This does not mean that producers of paint and varnish materials will not be called on to lend their assistance toward the preparation of specifications at a later date. Their assistance will, on the other hand, be of the greatest value at the proper time. The meeting, then, will be more of an experience meeting of those who specify and use these materials.

Members who cannot attend are requested to send in short papers expressing their views on all phases of this most important subject, such as choice and specification of materials, preparation of surfaces, number of coats and the mechanical composition of specifications so that it may be understandable.

### Advisory Committee

The Chairman, Mr. R. Jarvis Gaudy, announces that he has formulated a series of suggestions that will be sent to members of the Advisory Committee at intervals. There is involved in the problem of formulation of a policy for the Advisory Committee activities the matter of assistance that can be rendered in the organization of district activities, although this work does not properly come within the activities of the Advisory Committee.

Mr. William Rice Pearsall, Advisory Committee member in New York City, has, with the assistance of Mr. Louis O. Rohland, Mr. Ralph B. Higgins and Mr. Walter Bradnee Kirby, arranged for a meeting to be held in New York City on the evening of April 6 at the Yale Club.

Mr. Pearsall has sent the following letter to members resident in New York State and New Jersey:

"There is an effort being made to establish periodical meetings of the architects and engineers or their representatives, who are members of The American Specification Institute, for the purpose of exchanging information and comparing experiences which will be beneficial to all concerned in improving the writing of specifications.

"We should, as members in New York City, be able materially to assist each other by bringing together our experiences and methods of work which we have found to be most successful.

"The first of such meetings will be held on

Thursday, April 6, 1922, and is to be strictly informal. The subject which has now been suggested by two or three of us who got together last week is as follows:

General Methods of Writing Specifications

A. The best method of sub-division of various trades

B. The best method of sub-division for the letting of contracts

C. The best method of arranging the subject matter in each heading

"It is hoped that you will find it convenient to be present, and that you will come prepared with helpful suggestions, based on your office practice. It is not intended that prepared statements are necessary, but we would like each one to give his experience on this subject briefly with a view to everyone being able to take away from the meeting something definite that will be of service to him in his work.

"We will meet in the Lounge of the Yale Club up to 6:30 o'clock when we will adjourn to the main dining room on the twentieth floor for dinner and later adjourn to a private room for the discussion of the evening."

It is hoped that all members of the New York district will find it possible to attend this meeting to lend their assistance to the important work that will be under discussion.

Similar meetings will be held in other cities in the near future, the dates now being in process of determination.

Attention of members is directed to two errors in the list of Advisory Committee districts appearing in the February 15 issue. The state of Alabama should have been included in District No. 10 and not in District No. 4 and under District No. 4 West Virginia was intended, instead of Western Virginia.

The Advisory Committee membership is as follows: R. Jarvis Gaudy, Chairman, 140 So. Dearborn Street, Chicago; Frank Irving Cooper, District No. 1, 172 Tremont Street, Boston, Mass.; William Rice Pearsall, District No. 2, 527 Fifth Avenue, New York City; Seymour H. Knight, District No. 3, 1611 Chestnut Street, Philadelphia, Pa.; T. E. Billquist, District No. 4, 323 Fourth Avenue, Pittsburgh, Pa.; C. A. Graether, District No. 5, Washington Arcade, Detroit, Mich.; George C. Wright, District No. 6, 2007 Peoples Gas Building, Chicago; L. O. Kirk, District No. 7, 1200 Second Avenue, South, Minneapolis, Minn.; William F. Wischmeyer, District 8, Chemical Building, St. Louis, Mo.; John Galen Howard, District No. 9, First National Bank Building, San Francisco, Cal.; Harry B. Wheelock, District No. 10, Steiner Bank Bldg., Birmingham, Ala.; J. R. W. Ambrose, District No. 11, Toronto Terminals Railway Co., Toronto, Can.

There is being mailed to each member a list of all members of the Advisory Committee, a list of states comprising the various districts and a list of members in the district of which each member is a resident.

### New Members

The following new members have been elected: Walter Bradnee Kirby, Architect, New York City; Jack A. Scanlon, Engineer, Evanston, Illinois; J. Binford Walford, Architect, Richmond, Va.; Mackenzie Waters, Architect, Toronto, Canada.

Lodge House, Eaton Hall, Chester, England
*(From a photograph by Robert M. Blackall)*

# CORRESPONDENCE

### The Quantity Survey

The Editors, The American Architect:

REFERRING to the communication from Cass Gilbert published in the issue of March 15:

It is not my purpose to discuss competition for architectural commissions or to say what fees would be just and proportionate to service rendered. But surely the service promised will be an important factor in deciding either the choice of an architect or the amount of his fee. Today architects do not collect a uniform rate of fee for services and they never will so long as building owners exercise common business sense in appraising values and in buying service.

Service is the keynote. Does quantity survey give good service to the building owner, to the architect and to the contractor? That is the only question that is vital. The question of the surveyor's fee is irrelevant, and how it is to be paid a mere detail. Every reader of this magazine knows that building owners now pay indirectly many times more for work done by builders in taking off quantities than quantity surveys would cost.

Common business sense tells building owners that the protective features of quantity survey for bidders should draw closer bids and that anyway accurately prepared quantities will be enough lower to pay for themselves. They like the idea of seeing the bill of goods they must buy. It is more like regular business. It gives a proper trading basis. When they are enlightened concerning the indirect tax that contractors would otherwise collect for quantity work, but which the quantity survey system makes unnecessary, they wonder why architects and contractors have tolerated the old loose speculative methods so long.

Mr. Gilbert suggests that if the building owner wants quantity survey, let him promote it. I ask the readers if that is compatible with "the professional ethics so much to be desired." A building owner is entitled to the best advice and counsel his architect can give towards securing a good building at minimum expense. If quantity survey helps in that direction, an architect, it seems to me, would be bound by "professional ethics" to tell his client so.

However, I am not asking the recommendation of quantity survey merely to avoid a breach of the "Code of Ethics." I do ask it on the grounds of better service, which appeals to the business instinct as well as to the professional.

Mr. Gilbert states that "The Quantity Survey has not been a success in England." From the tenor of Mr. Gilbert's article as a whole I can only interpret this statement as meaning that to his mind quantity survey has been a failure in England because it has not increased architectural fees. The statement is certainly contradictory to the general verdict of those perfectly familiar with the facts. Quantity survey is held in the highest esteem in England and is used on practically all important work.

Mr. Gilbert speaks of added responsibilities through quantity survey and evidently fears controversies and litigations arising therefrom.

An architect assumes no responsibility for the quantity survey he uses in accordance with "Basis of Contract B." (See Joint Committee Report.) (Please note that we do not recommend making the survey part of the contract, although that is commonly done in England. When that is done an architect might easily feel responsible for the survey and be blamed by his client perhaps, though unjustly, if during construction errors in the survey were discovered, which required additional payment to adjust.) He guarantees it accurate only for bidding purposes. He does this to establish a required uniform basis for bids. The surveyor does not guarantee the survey because there is no satisfactory way in which he can do so. Before signing a contract the successful bidder may check the survey, and if he proves errors to exist in it, is permitted to adjust his bid correspondingly. Then the regular Lump Sum Contract for the erection and completion of the building in accordance with the drawings and specifications is made. The survey does not become a contract document and therefore cannot be a cause for controversy or litigation. On the contrary, the preparation of a survey by disclosing whatever ambiguous or contradictory items may have gotten into the drawings and specifications, forestalls claims for extras and allowances arising from such causes. Furthermore, by issuing the best survey procurable, one presumably strictly accurate, an architect does protect bidders against the all too easy quantity mistakes which can be made in rushing out bids. He protects them against misinterpretation of the design and against erroneous calculation of quantities. That is only fair play toward bidders. Thus quantity survey offers the means to give such protection against serious loss which every fair-minded architect must desire for contractors.

Quantity survey must properly be initiated by the architect. First, because without the co-operation of the architect it is impossible to make an accurate survey. Second, because the architect should control all matters relating to the execution of his design. Third, because even if a building owner felt favorably inclined toward quantity survey, he would leave the decision with his architect. Fourth, any architect who makes a whole-hearted recommendation for a quantity survey will seldom fail to get one. Fifth, Contractors cannot work the survey plan because they cannot guarantee the quantities accurate for bidding purposes, and hence the protective and economic features of it are defeated.

Wm. Graves Smith, Pres.,
The Quantity Survey Co., Inc.

### The "or equal" Clause

The Editors, The American Architect:

WE take pleasure in noting your editorial, commencing on Page 139 of the February 15 issue of The American Architect, in which you set forth the desirability of a straight specification freed of "or equal" clauses, and wish to commend you for the stand that you have invariably taken on this subject. Architects only have themselves to blame for the frequent disappointments, which are the result of that "or equal" clause.

This is a particularly vexing question to Associations and Organizations who are endeavoring to develop standards of quality and practice. The "or equal" clause frequently permits an inferior product, or a product not up to the established standard, to slip in at a cut price and it therefore does not protect the owner, but simply gives the contractor an opportunity to peddle and substitute for the kind or quality which the architect intended to have used.

The unfortunate part of this is the architects so seldom blame themselves when the results are not satisfactory, but complain to the agency which is responsible for the article recommended and accepted as the basis of standard in the writing of specifications.

H. S. Brightly, Service Engineer,
Indiana Limestone Quarrymen's Association.

### Tennessee Memorial Competition

WE publish in this issue of The American Architect the three premiated designs for the competition for a War Memorial to be constructed in Nashville, Tenn.

In the program it was suggested that "the memorial be so treated as to form with the Capitol as nearly as possible a single composition." Accordingly, we think that the drawings that we present will be of special interest to our readers, particularly to members of the American Institute of Architects, who will no doubt recall the Convention that was held in Nashville some years ago. The Capitol Building then attracted much attention and the suggested treatment of these additional buildings is evidently the beginning of a great program for Nashville's future official center.

So that these drawings may be clearly understood we quote further from the program: "The authorities have united to establish a memorial in the form of two buildings, a park and a boulevard," and further "Toward the latter, on the axis of the Capitol, extends Capitol Boulevard, now furnishing a short approach from Church Street, one of the City's principal thoroughfares, but expected eventually to extend southward to Broad Street, the other chief highway of the City's center. Upon either side of Capitol Boulevard the commission have acquired properties which with the boulevard and surrounding streets, create a plaza of about 460 by 600 feet, forming a forecourt to the Capitol. These properties, save as dedicated to a new street named below, will be known as 'Victory Square'."

### Damp Linen Fire Hose

COMPLAINTS frequently reach the National Fire Protection Association that unlined linen hose has been seriously injured by mildew and rotting of the fibres. Investigation of several recent incidents of this sort has revealed the fact that on delivery of the hose and before installation it had been subjected to a hydraulic pressure test, and not thoroughly and completely dried out. Damp linen hose will rot. A leaky valve on the stand pipe may pass enough water to rot the hose at the coupling. Linen hose should not be wet unless it can be completely dried in every part.

### Fire Prevention Lessons in Schools

THE Fire Prevention Committee of the Philadelphia Chamber of Commerce reports an arrangement with the Superintendent of the Department of Public Instruction of the State of Pennsylvania, to introduce the study of fire prevention in the public schools throughout that state. The syllabus, which is to include accident prevention, is now being prepared for the opening of the schools in September.

### St. Martin's-in-the-Fields

THE most conspicuous church in London, St. Martin's-in-the-Fields, will not have celebrated its bicentenary in vain if the numerous notices of the event that have appeared in the lay press succeed in whetting the public appetite for information about buildings. Many Londoners will have conveyed to them now for the first time the information that James Gibbs was the name of the architect; that a bust of him by Rysbrach stands just inside the church; that King George I was its first churchwarden (apparently the only king who ever assumed that office); that Francis Bacon, Charles II, and Hampden were christened there; that Nell Gwynne, Fairfax, Roubiliac, Rose the gardener who laid out St. James's Park, and Thomas Chippendale, are among the celebrities buried there.

# BOOK NOTES

### The New Kidder*

WITH the seventeenth edition, Kidder's Architects' and Builders' Pocket-Book has been styled Handbook, which shows that even publishers may develop a sense of the fitness of things. Changes have been made throughout the book and there have been added, Chapter XXX, on Specifications for the Steelwork of Buildings by Robins Fleming, of the American Bridge Co., and Chapter XXXI, on Domical and Vaulted Structures, by Edward F. Ries. Mr. Rudolph P. Miller, until recently Superintendent of Buildings, Borough of Manhattan, New York City, has re-written Chapter XXIII, on Fireproofing of Buildings and Chapter XXIV, on Reinforced Concrete Construction. Mr. Louis A. Harding has re-written the sections on Heating and Ventilation, and Chimney Construction.

The popularity of Kidder as a text and working manual is bound to endure as long as the Editor-in-Chief, Prof. Thomas Nolan, continues to demonstrate his ability to understand how to meet the needs of men who have use for a handbook of building construction. It is today indispensable in the office of every architect and architectural engineer.

**The Architects' and Builders' Handbook. By the late Frank E. Kidder, C.E., Ph.D.; Compiled by a staff of specialists and Thomas Nolan, M.S., A.M., Editor-in-Chief. 17th edition, enlarged. XXIV + 1907 pp. Ill. 4¼ x 7 ins. Flexible binding. New York, John Wiley and Sons, Inc. Price* $7.00.

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### Professor Hamlin's History of Architecture*

THIS work, since first published in 1895, has gone through three editions and fifteen reprintings. Each edition has been carefully revised and brought down to date of latest facts as affecting, particularly since the great war, the history of architecture all over the world. While primarily written to meet the needs of the college student, the author has happily so arranged the discussion of his various topics, divested his writing of the ultra-technical phraseology of the text book, that the general reader may take up this volume and read it through with both pleasure and profit. The treatment and description of architecture from its earliest periods down to the present day become a very large undertaking.

In putting together a work of this nature, the writer therof, knowing all his facts, will proceed almost exactly as will the landscape painter who thoroughly knows the phase of nature he sets down on his canvas. In both cases, a thorough knowledge of all the facts enables the author or painter competently to omit those that are not necessary to the exact presentation of his subject.

In fact, elimination will require as much, if not more, skill than the presentation with every detail present. Prof. Hamlin had necessarily, in producing a volume of this limited size, on a topic so large, to exercise a scholarly method of elimination. This faculty he has shown he possesses to an unusual degree. We have a history of architecture in which no essential is missing and in which no non-essential mars the accuracy of authorship.

**A text book of the History of Architecture, by A. D. F. Hamlin, Professor of the History of Architecture at Columbia University. Full cloth, 477 pp. Price* $2.50. *New York, Longmans, Green & Co.*

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### Seeing is Deceiving*

MR. LUCKIESH begins his latest book with the trenchant sentence "Seeing is deceiving" and, what is more, proves it to be true. According to this interesting writer misleading perceptions may be divided into illusions and hallucinations. Error in judgment is responsible for the "illusion" that two lines appear to be of equal length when they are not. If something is seen which does not exist, the imagination is responsible for the "hallucination," for the essential facts are supplied by the imagination. The author in the introductory chapter differentiates between misleading perceptions and, eliminating those created by the imagination, fills 250 pages with examples of errors in judgment, their causes, effects and how they may usefully be used. Errors in judgment may cleverly be utilized strongly to affect the imagination. Illusions may produce hallucinations.

During the late war the appearance of camouflaged ships caused much comment. Early attempts apparently were directed towards creating vessels which would disappear from view in the expanse of sea. Spars, however, cannot be concealed, nor can smokestacks and upper works. Mr. Luckeish tells how the camouflaging of ships reached the point where broad stripes of pronounced colors superseded irregular splashes, the object being the production of geometrical optical illusions which made it impossible for periscope observers in submarines to determine the course of a vessel. He tells how camouflage was applied to submarines and even to aeroplanes.

Camouflage, however, occupies but small space; far more is given to lighting, painting and decoration and also architecture. Devotees of the graph-

**Visual Illusions, Their Causes, Characteristics and Applications. By M. Luckiesh. 252 pp. 100 illustrations 6x9 in. Cloth. New York, D. Van Nostrand Co.,* $3.00.

ic arts cannot fail to be helped by this entertaining book. It contains no mathematics and the avoidance of technical terms and pedantry makes it interesting to all readers who love what is curious and stimulatingly speculative.

### The History of Architecture*

THE late Prof. Banister Fletcher, F. R. I. B. A., and his son wrote a history of architecture which went through five editions, the first of which appeared in 1896 and the fifth in 1905. Promises of a sixth edition led to six reprintings of the fifth edition at intervals, the last being in 1920. The sixth edition is now on the market, written by the son who says in the Preface "........I have now entirely rewritten and recast the book from cover to cover. I have not relied solely on other authorities, and my descriptions are largely the result of personal observation of the world's greatest monuments from ancient Troy to modern Chicago."

The book is a veritable encyclopediac history and describes and discusses the historical styles, those of ancient and modern Europe and modern America; as well as the non-historical styles, Asiatic and Saracenic. The author uses a comparative and analytical method throughout, each period being divided into five sections as follows: 1. Influences: Geographical, Geological, Climatic, Religious, Social, Historical. 2. Architectural Character. 3. Examples. 4. Comparative Analysis: Plan, Walls, Openings, Roofs, Columns, Moldings, Ornaments. 5. Reference Books.

The type is ordinary newspaper size and, while easy to read, gives one a forbidding impression at first glance. The style is pleasing in spite of the meticulous care to preserve the encyclopediac value of the work. A glossary, in smaller type, fills 9 pages and the Index fills 60 pages. The author quotes Morgan, "Architecture is the printing press of all ages, and gives a history of the state of society in which it was erected," and this idea he keeps to the front in his work.

It is by no means a book one would expect to finish at a sitting; nor would one count on reading it from cover to cover except under urge. As a work to dip into from time to time and to refer to for dates and facts it is satisfactory. For the use of the student of architecture it may be strongly recommended.

* *A History of Architecture on the Comparative Method, for Students, Craftsmen, and Amateurs. By Sir Banister Fletcher, Architect, F.R.I.B.A., F.S.I., F.R.G.S., F.R.S.I., etc. Sixth Edition, Rewritten and Enlarged, with* 3,500 *illustrations.* 932+*XXXIV pp. Ill.* 6x9 *in. Cloth. New York. Charles Scribner's Sons.* $12.00.

### The Design of Steel Mill Buildings*

THE first edition of this work appeared in 1903, the second in 1906, and the third in 1912. The author states that the present and fourth edition has been re-written and much new material added. Of the 410 cuts more than half have not appeared in previous editions and practically all of the old cuts have been re-drawn. The scope of the book has been enlarged by the addition of a discussion of the calculation of the stresses in statically indeterminate trusses and frames, several problems in framed structures and detailed designs of a crane girder, a roof truss, and a steel frame mill building. A complete specification for steel frame mill buildings is given in an appendix.

It is a satisfying work for any man to read who is interested in steel design. A copy should be owned by every structural designer, for it is complete and up-to-date.

* *The Design of Steel Mill Buildings and the Calculation of Stresses in Framed Structures. By Milo S. Ketchum, C.E., Director of the Department of Civil Engineering and Professor of Civil Engineering, University of Pennsylvania, etc. Fourth edition, Re-written.* 632+*XVIII pp.* 401 *ill. Flexible binding.* 6x9 *in. New York, McGraw-Hill Book Company, Inc.* $6.00.

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OLD ALCAZAR GARDEN, CORDOBA, SPAIN

AN ANTIQUE MOORISH TOWER OVERTOPPING THE WALLS OF THE ALCAZAR, WHERE KING FERDINAND AND QUEEN ISABELLA LIVED. A GLIMPSE OF THE WATER TERRACE IS SEEN IN THE FOREGROUND

*(See "Gardens—Old and New" by Francis Howard)*

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, APRIL 12, 1922 NUMBER 2391


# SPANISH GARDENS—OLD AND NEW

BY FRANCIS HOWARD, Garden Architect

Illustrated by photographs by the Author

*THE reason Francis Howard is so well qualified to speak of Spain and its gardens is that in a land of traditions and among those whose traditions are sacred, he has entered the preeincts, generally shut to the outside world, through the road of respect for the past and love for the present of all that makes Spain great in history, literature and art. Thus he became welcome in those private gardens of the Spanish Grandees and made the unusual photographic studies, a few of which are shown in this article. Mr. Howard's love for the past is not a mere prejudice but is the basic principle on which is founded his success as a designer of beautiful gardens.*

*The following is from an address recently delivered by Mr. Howard before the American Institute of Architects on the subject of Spanish Gardens, and we think it particularly apt just now on account of the wide-spread interest in this subject and the practical applicability of this character of garden design to the surroundings of our city homes, where ugliness has installed itself, especially during the rapid city growth of the past fifty years.*

THE EDITORS.

View in a Private Garden at Seville, Spain, showing ancient Roman column of granite surmounted by marble statue of great antiquity, with flower beds laid out around it, a small water channel of tile in the pavement, and interesting wall treatment

TUCKED away behind the walls of sleepy old Cordoba, and within walking distance of that most noble monument of the Tenth Century, the Mosque of the Moors with its eight hundred marble columns, is a private garden surrounding the Villa of a Spanish Grandee, the Marquis de Vianna. Stepping out from the beautiful patio that occupies the center of the building, one enters the charming court to the right. For here is dancing sunlight and moving shadows on old gray walls over which grape vines twine. The walk by the wall is of two sizes of light red tile, laid in a geometric pattern and leads to a pretty wooden gate of spindles painted blue. At the left of this is a path of gray gravel, a setting for a few orange trees growing in rectangular beds bordered by clipped boxwood hedges. If you wish to see some real examples of boxwood hedges you may look into the next court, paved with bricks, and enjoy four immense types of this evergreen clipped in spherical shape, ten feet in diameter and three hundred years old; their small leaves shimmering against the white stucco of the

Villa, from the wall of which opens a casement window onto a truly Spanish balcony. It is astonishing that this little court is not overcrowded by these immense plants. The graceful arches of trimmed cypress, which connect these ancient boxwood hedges make one of those rarely beautiful settings which only time and skill can create. Underneath this extraordinary arbor is a simple old fountain containing a quaint, stone figure and surrounded by potted plants. Down the path that ficient barrier in case of need. This garden is one of the best illustrations of the family life and thoughtfulness of the Spanish people. Their dignity of manner is not an affectation, and their gardens, although dignified, are not affected but are a logical growth from year to year and from century to century of a civilization which has its roots in Rome, and which has survived all the shocks of the Moor and the Goth during a period of over two thousand years.

**Private Garden of the Marquis de Vianna, Cordoba, Spain**

**Note the wall pierced with arches, dividing the flower garden from the vegetable garden**

leads away from this arbor, the eye is carried and sees, in pleasing perspective, the simple wall of the Villa ending in the graceful old tower of a nearby church.

What an unusual way it is to raise vegetables and fruit in beds radiating from a center and surrounded by clipped hedges, and what a sense of architectural fitness there is in the wall with its wide arches and tiled coping, which separates this part of the garden from the next division. The Villa is always seen as a part of the picture and its walls and roof make the whole thing domestic and intimate. Like every garden in Spain, simple iron grilles and gates are used under the arches, allowing the sunshine and air to pass freely through them, but forming a suf-

### A Neglected Garden—Cordoba

JUST outside the city, along the banks of the Guadilaquivar, lies a garden over which the hand of time has passed, leaving behind it moss and decay but leaving also an atmosphere of peaceful repose that is very beautiful. Walking through the high gate and down the broad steps we enter an almost forgotten world and find ourselves actually wandering along the paths where walked many a famous cavalier of the Fifteenth Century, including Christopher Columbus who, for four years often talked and pleaded here with Queen Isabella, trying his best to persuade her to aid him in his wild project of crossing the untried seas toward the unknown West. The sturdy walls,

View in the Private Garden of the Marquis de Vianna, Cordoba, Spain, Showing an old Fountain under Cedar Arches Forming a Circle around the Center of a paved Court with fine Boxwoods at Corners steps and water basins of this garden stand as they did in that day, a little more worn and ragged, but still graciously welcoming the lover of beauty who seeks it in secluded nooks like this, under the walls of the old Alcazar of Cordoba.

The dominant walls of the great Moorish tower pile up at one corner of the garden and are reflected in the still waters of the pool. Old vines and their white flowers drape themselves over the iron railing of the stairway, and on the well-proportioned and stuccoed posts are terra cotta pots of graceful outline containing small boxwood plants. A greenhouse is on the upper terrace, over which hang the moving branches of eucalyptus trees.

What fine arches of bent saplings the Spanish gardeners make each year, and how delicately the leaves of the climbing rose are outlined against the sky. One feels the invitation to walk under the fragrant arch, up the easy steps, and on to the water basins. There are three terraces in this garden. It is not flat like others in Cordoba, so the water is stored as we have seen in the basins on the upper terrace and distributed from there all through the lower ones where grow the usual vegetables and the inevitable orange trees with ornamental but bitter fruit.

View in Garden of the Provincial Museum at Cordoba, Spain, Showing Fountain and antique Statue of Bacchus in the Foreground

The illustration of the large stone fountain, (about ten feet in diameter), gives a good idea of the type of garden ornament so appropriate to the quiet effect of this spot. This fountain is octagonal in form and has a high basin, about three feet, for its lower part with a plain upper bowl from which the water constantly drips to fill the water jugs of the neighbors, when they gather every morning and evening throughout the year. It was raining gently when these pictures were taken but my assistant assured me they would come out better than if it were too sunny, and he, being a native of Cordoba ought to know, so I left it to him.

### Garden of the Provincial Museum—Cordoba

If one wants to enjoy a combination of historic architecture, with touches of archæology, and an appropriate garden setting, go into the small court of the Provincial Museum in Cordoba just off the "Plaza del Petro" near where Sancho Panza is said to have bought his horse, and look at the arrangement and proportion of the enclosure. Arches of Moorish type of brick of varied texture fill one side of the court yard, while most of the other wall surfaces are stuccoed. The space is rectangular in plan but the four sides of it vary in the height of their walls and are enriched by inlays of blue and yellow tiled panels, wrought iron grilles in front of windows, and a loggia above. This court is a gem as an example of city

View in the Garden of the Marquis de la Vega, Toledo, Spain

Patio and Marble Fountain with Star-shaped Water Basin in the Garden of Senor de Cepero, Seville, Spain

Garden of the Marquis de Toledo, Toledo, Spain
A true Spanish garden, correct in color, form and the setting of its architecture

garden planning because it is limited in every way and does not depend on rapidly fading flowers for its permanent scheme of color. The central fountain is of the true, simplest form of Spanish stone font and is graceful though so sturdy and severe. There is a tile border around its octagonal lower basin and four paths radiate from it to the corners of the place. In the spaces thus formed are planted evergreen hedges about two feet high and within these little enclosures are put ornamental trees that can be renewed from time to time. The beautiful statue of Bacchus shown near the fountain is of Greek marble of the First or Second Century, and was dug up beneath this very pavement.

### Garden of Senor de Cepero—Seville

THERE are many lovely gardens in carefree Seville and one of the most charming private ones is that of Senor de Cepero the patio of whose house is shown in the illustrations. Its simplicity appeals to one wearied by the false aspirations of Madrid and Barcelona towards architectural heights. Here is the Moorish arch on well proportioned Renaissance marble columns while a vigorously designed marble fountain adorns the center, and is sunk into the eight pointed star-shaped basin in the middle of the paved court. An edging of blue, yellow, and white tile follows around the border of the basin while plants and boxwood trees in terra cotta pots rest the eye in this quiet place. At times a blue sail cloth is drawn across from the upper stories making an ideal retreat.

### A Private Garden of Seville

THIS is an ideal combination of architecture and gardening as limited by the uncompromising walls and spaces of a city home. At the right there is a water tank, built of cement and bordered with colored tile, from which the plants are refreshed. Most of the ground space is covered with colored gravel but in the portions left over, low evergreens are planted around flower beds to frame them in and keep them from straggling. Water is led through narrow tiled canals from the tank to various parts of the garden, which after all is only a courtyard; vines climb on the walls, and arched trellises divide this from the next "room" of the garden, and a low ledge, inlaid with tile, all in color, forms a sort of bench or seat. The column with its Roman fragment mounted on it, is a beautiful note connecting the present with the past as well as giving a needed accent at this point. Then the pierced terra cotta balustrade along the top of the dividing wall beyond has great value structurally, decoratively, and historically, with its refined Gothic detail. The roof tile again that cover the adjacent buildings make a pleasing frame for the picture against the sky and cause one to be thankful that in this little garden, as in so many others, the Spaniards have omitted nothing which would delight the eye, yet there is no crowding, but always the noble and simple sense of proportion with its respect for great traditions.

### Garden of the Marquis de la Vega—Toledo

LOOKING out, through the door, across the porch that stands between the old fashioned kitchen and the garden of this picturesque house of the Sixteenth Century, I could but exclaim to my companion, "this might well be the setting of a house at home!" I meant that the garden setting as shown appealed to me as being quite practical for application to our own homes in America. Here, for example, are brick walls covered by climbing ivy, with flowering plants in pots sitting nonchalantly on the edge of a brick cistern from which the water is taken to wet down the garden. To be sure the columns of the veranda are stone, but we will come to that, and the beautiful grille over the window is wrought iron, which we also can make. The only thing we don't seem to understand yet is the simplicity of contour and the broad wall spaces, giving a chance for the shadows to make patterns on the bricks.

The intimate interior of the patio of another house in Toledo shows a treatment truly Spanish but more luxurious than the other. This is a garden secluded from the world and only open to the sky. The ground is paved with tiled walks of light red with yellow and blue inserts of glazed pieces, the flower beds are raised about three inches above the walks, and the plan centers around the octagonal low tiled basin of the star-shaped fountain of marble. How simple are all the fundamental contours here, but how varied are the suggestions of historic ornament which occur, for example, in the Gothic fragment of balustrade, the Moorish lattice on the upper balcony, the balcony itself with its renaissance balusters of wood surmounting graceful curved roof tile. Then the stone columns, above and below their Gothic feeling, and, on the wall the Arms of the family built in so they will outlive the varying revolutions and eccentricities of man. Over all this climb roses in Spring, and lilies grow in the water of the pool. In all our vast California and our many Southern cities and towns I do not recall a single courtyard that yields to us the poetic beauty of this modest home in the time worn and high walled city of Toledo.

# ARCHITECTURAL EDUCATION

## PART III—TRAVEL AND STUDY ABROAD

BY C. H. BLACKALL, F. A. I. A.

PRESIDENT ELIOT once characterized foreign travel and study as "that foolish beginning and most excellent sequel to education." It was not so very long ago that there seemed to be a feeling that a young man could not go to Europe too soon, and that if he could but get into the Ecole des Beaux Arts early in his architectural training, his future was assured, but that was in the days when our own schools were in their beginnings and the time has long gone by when the Ecole des Beaux Arts is a necessary factor in our educational system. There is now a very general reluctance on the part of our architects and our educators to advise a term of study in the Ecole des Beaux Arts. The conviction has crystallized that foreign travel and study should properly be the final factor in education, post-graduate in its nature, the last step before the take-off into the abyss of architectural practice. It sounds reasonable to say that we should send our young men abroad early in life, even before they are twenty-five, and that in that plastic age they will imbibe the spirit of Europe and its art treasures, but the truth of such statement is by no means accepted. It, to be sure, depends a great deal upon the man himself rather than his age, but except in a few rare cases of undoubted talent, a man will profit most by acquiring his culture after his foundation has been laid in schooling and practice. Culture in this sense is not innate or acquired in the school, but is built up on long, thoughtful experience and observation, and culture in the finishing sense is what Europe, with its past, can give us if we are ready to take it.

There are two attitudes which conduce a great deal to success in foreign study. Boston has been defined as a state of mind, architecture as a mood made permanent; and it is a state of mind and a fixed mood, or attitude towards life and its problems that is really necessary before one can even begin to profit by what Europe offers so freely to the elect. There must be a cordial acceptance of what is there to be found, not a critical attitude which would select what pleases and throw out what fails to conform to a standard, no view of Europe through colored glasses made in America, and no comparing of results with what has been in Sheboygan or Boston, but rather a frank recognition of the fact that certain great works of art and architecture have endured for centuries, that those works have survived by a process of elimination and represent now the best that past ages have bequeathed to us. It is, therefore, up to us not to say whether they are good or bad by relation to any cis-Atlantic standards, but to find out just what they are, how they were conceived and developed; and if we cannot appreciate them, or measure them up, it is our fault and not the fault of the monuments. In a sense, the attitude should be to avoid mere practical subjects, assuming that the student has had already a good American foundation, has built on it the superstructure of discriminating application, and that he does not go to Europe to know what he should do, or how to do it, but rather to develop individuality and æsthetic character. That is the first attitude, and the next is much like it. The young man should feel that he is in Europe to study in the very best and most complete sense, not as a tourist to see the sights, or live the life abroad, not to collect documents as such, surely not for social diversion, but for just one thing—to soak up like a sponge all the fine flavor of Europe and to study it, weigh it and appropriate it until he knows just why it is what it is. With these two attitudes, an open mind and a determination to do nothing but study, the young man is pretty sure to get what he goes for.

But there are several things he must not do. One is do not stay there too long. The length of time a man can profitably remain abroad is partly a matter of temperament, but in most cases it is a fortunate thing that limitations of money prevent a man from staying as long as he would like to. Indeed the man who retains the most fresh and inspiring memories of Europe will be the one who cannot afford to waste any moments, and leaves when he feels the wealth of Europe is just opening before him. I have known of young men who have stayed so long that when they returned to this country they were out of touch with our wants and our aims, were architectural prigs and required a severe dose of Americana to take the taste out of their mouths. Two years is a long time. Three years is altogether too much, and observation of many boys who have gone abroad convinces me that one year intelligently applied is about as much as any one man can make his own.

Another thing, do not take a camera. When a young man starts his preparation for abroad, the first thing he thinks of is a camera, and he goes there, snaps right and left, takes possibly very many excellent photographs, but the trouble about a camera is it makes things too easy and substitutes a mechanical act for the digging quality of personal sketching. And the man who uses a camera, rarely sketches. I have known some architects who had the nerve absolutely to refuse to take a camera, or even buy a photograph, and they admit that the value to them of being forced to note their impressions with their pencil in sketch form was one of the greatest factors in their successful study abroad.

Another point—never form entangling alliances. They are very easy to get into abroad. A good fellow is not necessarily a proper architectural travelling companion. Social amenities feed the hungry and often homesick boy, but they can be carried too far and often are, and the young man cannot be too jealous of his time. There is so much to see, so much to do, so much to profit by that he can ill afford to share his opportunities as he goes along with those who do not give quite as much as they take, and this applies also to the architectural schools and academies abroad. Excellent as they are, well intentioned as they all are, they are danger spots for the man who wants to get the best out of Europe.

But there are plenty of things he can and will do. He should know the people in the sense of appreciating the connection between popular emotional life and the corresponding representation in national architecture. That does not mean social diversion, but it means an intelligent study in place of the forces which find representation in architecture. Certainly he should always sketch. Drawing is the language of architecture, and a man cannot get too much of it, provided, however, that he thinks a great deal more than he sketches. And in order to offset the natural tendency to haste and superficiality, the student should draw out a few things very carefully and render them thoroughly, and this drawing and rendering should not be done at home after his return, or during some winter sojourn in one of the large cities, but should be done on the spot, beside the very monument which he is studying so he can transfer onto paper not an impression, but the exact spirit of the monument he has selected. A great deal of this kind of work is not desirable. It takes too much time and interferes with general study, but a little of it is indispensable, and most of our students who go abroad on their own initiative fail to grasp the value of just such kind of work and inevitably come back with a host of sketches but no thoughtful, measured work.

Above all things, too, the student should not let himself be hurried. There are unlimited opportunities in Europe, but he cannot grasp them all. At the most he could hope to catch only the spirit of what he finds and to study a few things well, but if he goes at his work and his study with a sense that he is driven or hurried, that he has no time to pause, to ponder and to sift, his mind in a very few months, even in weeks, will become a blur and he will have to stop and catch up with himself in order to feel that he is doing anything worth while. A man must think a great deal more than he draws or travels, and he should think, too, partly with the help of other eyes. When he is in Rome he should study it with the Letarouilly as a text book; when in France, no better aid could be found than to compare Henry Adams with the glorious French Gothic. I remember very well the advice that a very talented English architect gave to one of the earlier American travelling scholars, telling him not to bother about sketches or envois, or practical considerations, but to sit down in front of Notre Dame, for instance, look at it, study it, admire it, open his soul to it, perhaps go to another equally good monument and absorb its spirit, and then write back to the committee in Boston that he had been looking at a lot of buildings and had not made any drawings. The advice was excellent for that man. It might not be the thing for another one, but the chances are that most men who go abroad will gain more by contemplation and absorption than by mere hard work.

The details of what a man shall do, or shall not do cannot be analyzed or specified so as to be capable of general application to everyone, for the prime object of European study and travel is the development of the artistic character of the individual. It must never be forgotten that foreign travel is not fundamental, but psychological, and of all the arts, certainly architecture is the one which has the most vivid, and at the same time most intangible soul.

Now as to travelling scholarships. Shall a man consider that they offer the very last word in his architectural education? Again it is a case of the individual, but generally speaking, any man who can win one of the real architectural scholarships which sends him abroad not to vegetate, not to waste his time on unnecessary drawings, but really to study, can call himself singularly fortunate and by all means he should try, for even if he fails, the very trying is a pretty good preparation for independent travel. The advantages of a scholarship are partly in the name and reputation which come to the man in its association with others who have gone before and who will come after, but chiefly as compared with the independent scholar in the fact that it offers certain definite restraints and incites to a definite and continuous program. Of course, a man may merely wander over Europe, follow his sweet fancy and come back with a mind immensely enriched; but if that same man will go with a definite program both as to time, and place, and subject, and will loyally submit himself to the guidance and the friendly discipline of those who are striving to make him find his best expression, he will profit far more and that gain will be more lasting than if he were all by himself. The architectural scholarships are not only fine in their influence on the men who hold them, but they are constantly building up the standards for the hundreds of boys who go abroad every year alone.

A course of study and travel abroad is a complement to preparation for practice, provided that study and travel are truly educational and really develop personality, but it cannot be said that such a course of study is necessary, or that a man cannot be an architect without it. It is simply a capping stone and crowning feature of an architectural course. We are so busy here all the time that we need a constant stream of imaginative enthusiasm for pure architecture to be injected into our daily grind of work. We would not have that daily grind any less, but we want to bring to it all the romance and beauty that has endured from the past and put these factors at our service in the real problems that America is working out so thoroughly today. The real object of foreign travel is to teach the young men to think a great deal more than they draw, to dream dreams that are full of architectural wealth, to cultivate an æsthetic imagination which will be an improvement upon our own and to enable them to come back to this country not charged with photographs, with many pencil sketches, with laboriously rendered drawings, but surcharged with at least an understanding of the divine afflatus which is the necessary endowment of a great architect, filled to the brim with the idealized enthusiasm which can be so stimulated by those great works of the past, and conscious that the inheritance of the ages is not limited to France or Italy, but that it can be made our own right here today in these, our United States of America.

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# HOW AN ENGLISH ARCHITECT VIEWS AMERICAN ARCHITECTURE

MR. WILLIAM PATTERSON, F. R. I. B. A., in a letter referring to an article on American Architecture, printed in the *Journal of the R. I. B. A.*, and reprinted in a previous issue of THE AMERICAN ARCHITECT, states:—

Living near New York for over two years, may I add to Mr. H. Austen Hall's extremely interesting and instructive article? "American architects are more successful in the handling of the larger problems of design than we in England," says Mr. Hall. He is right. Of this there is no question.

Compare the Pennsylvania Railway Station and Boston Public Library (McKim, Mead and White) with several recent buildings within a short distance of Charing Cross. The comparison is very unfavorable to the work in London. Especially is this the case in regard to the detail. The station mentioned is an ideal conception of what a railway terminal ought to be. The Morgan Library is certainly a "gem," as Mr. Hall says, being perhaps the most perfect example in delicacy of detail of its kind, resembling the atmosphere of Chopin in a more solid form. The great care bestowed on the detail of many of the more notable public and semi-public buildings in this country is most marked. A careful note of these facts is well worth recording. I was particularly struck, when visiting the Boston Public Library, with the entasis on the columns of the arcade in the quadrangle. The proportions were perfect. Often with little or no ornament, and with great simplicity of detail, massive and imposing effects are produced in a manner almost unknown in England. Although the "loft" building or "skyscraper" may not create much feeling of restfulness or repose, the way in which many of these have been handled is very skilful, and one cannot help admiring the ingenuity and inventive faculties exercised in overcoming difficulties in their design and execution. Lord and Taylor's Store, Fifth Avenue, is a fine example of what a "department" store can be. What Mr. Hall says is again very true. Because a building is of large scale there is no reason why the detail should be coarse and unrefined. The detail of the stonework on the two lower floors of this building with balcony above would well repay a visit to New York to anyone who contemplates the erection of a large structure of a similar nature in London or elsewhere. Many of the banks would astonish most Britishers who have never seen an American banking institution—examples, again, of designs beautiful in detail and proportion. A notable addition to the Gothic style of architecture is to be found in New Haven, an old-fashioned university town.

The new Memorial Quadrangle at Yale University is a charming building, characterized by great skill in the handling of the stonework which is most effective. It is a fine example of modern Gothic. Generally speaking, however, not very much enthusiasm can be aroused for Gothic work in the United States compared to English work of a similar nature. Of modern buildings in London the Roman Catholic Cathedral, Westminster, can worthily take its place with any building in America. Allow me again to endorse Mr. Hall's remarks when he refers to the "old Colonial style," in the development of which there is room for much scope, as evinced by numerous fine houses by Mr. Platt and others. The Southern Colonial style is especially charming, and numerous fine old examples still exist which can be adapted to the designs of the modern American house with delightful effect. Regarding domestic work, Mr. Hall again says that "England has long been supreme." Yes. The best types of modern domestic architecture in England still hold a unique position. There is a peculiar charm and fascination about the houses of Old England never surpassed in any country. The Englishman still holds the field in domestic architecture.



Two Designs for Playing Cards by Edith M. Magonigle, President, National Association Women Painters and Sculptors, exhibited at the recent exhibition of the Architectural League of New York

# ·EDITORIAL·COMMENT·

AT ONE TIME OR ANOTHER, THE AMERICAN ARCHITECT has felt it a duty to refer to misleading statements in the daily press and journals in fields other than architecture. This journal has always expressed regret that such conservation of the rights and dignities of the profession of architecture should apparently be only through the unofficial press. Forty-six years ago, at its inception, THE AMERICAN ARCHITECT, then the only architectural publication in this country, declared its purpose to uphold the honor of the profession. This it has since invariably done, and so it will always continue to do. But there was reason to assume when the Institute decided to take up technical journalism that its purpose was identical as to the dignities of the profession with the course pursued by THE AMERICAN ARCHITECT, and the editors of that journal naturally believed they would have a responsive and closely working ally.

On each occasion when there have been widely disseminated statements derogatory to architects and the true interpretation of their professional activities, THE AMERICAN ARCHITECT has waited for some action on the part of the *Journal.* It cannot recall a single instance when these aspersions have received official notice.

*Engineering News-Record,* in its issue of March 30, prints the following editorial under the title, "Architectural Responsibility." It states:

> Ultimately a single brain and conscience, the personality of one man, stands back of any structure and guarantees its safety. The architect is that man in the case of buildings. Does he, in fact, assume and fully discharge this responsibility, or is it merely a matter of form? That is the outstanding query resulting from the Knickerbocker disaster, and it is squarely up to the architectural profession to answer it. If the architect's creative responsibility, and the associated guarantee of adequate construction, is a mere historic form, without substance, it is time that the facts were known to all the world and time that other means to guard public safety be provided. If the responsibility is still to be regarded as real, it is time that steps were taken to make it real. The point at issue is a condition such as found in the Knickerbocker case—and such conditions, it must be admitted, are far from uncommon—where the architect gives careful attention to the externals, the appearance of his structure, but depends for the vital matter of making the structure safe upon an interested party, namely, a sub-contractor, without even an attempt to check the result. If the responsibility for the safety of a building may be thus divided and farmed out, what is left of the personal and competent answerability of the architect for his structure? What is left of the architect? The practices and laws requiring buildings to be planned by architects, and all plans to be duly accredited by his signature, have been regarded by the public as an assurance of safety. It is no assurance of any kind, however, unless the architect definitely assumes the responsibility implied, and shapes his practice so that his guarantee is real and not a sham.

Do architects fully assume and discharge their responsibilities, or are their services rendered as a matter of form?

An unusual opportunity is at hand for the American Institute of Architects, as the highest architectural authority, to state exactly its attitude towards the entire profession.

* * *

ARCHITECTS WHO ARE ABLE during seasonal periods to visit resorts in search of recuperation, rest, or the always fascinating golf, will have become impressed with the inartistic tendency of the architectural development of popular resorts. While there may not be as much opportunity for unfavorable criticism of the various towns along our Atlantic seaboard, where the tourist flocks because of its picturesque and quaint allurements, popular towns in the South are not as fortunate in their development.

Towns with a normal population of approximately ten thousand, grow at the season's opening to four times that number, and as quickly at the season's close dwindle to their "native" population. The demand for housing, more generally of bungalow types, becomes at one time enormous and at another the towns take on scenes of desolation.

The structures erected are by no stretch of imagination, architectural. Men from every state of the Union, allured by the attractiveness of climatic conditions, seek to build a house where during certain periods each year they may live with their families. In most cases these men ignore the local architect, and bring with them plans from which they build a house. The result may be easily imagined. The man from Chicago builds a house purely middle Western in character, while the man next door, who "knows nothing about architecture, but knows what he likes," gets his builder "back home" to "fix him up a set of plans." Across the street, a certain "studio dweller" from New York, whose ideas of living are based on Greenwich Village lines, constructs a house, the delight of his cubist friends and the demoralization of the neighborhood. Meanwhile, as these resort towns grow, the transient population keeps on building and continues to ignore the traditions of the neighborhood or the conditions of climate.

The results of this irresponsibility are everywhere apparent. Locations that attract by reasons of climate or picturesqueness, soon become so unattractive by reason of their lack of coherent architectural development as to repel the best types of men and women who seek a residence for definite periods.

The remedy for these conditions lies wholly in the hands of those who are responsible for the town government. The present attitude seems to be based on a desire to attract those with money to spend, ignoring proper supervision as to how it should be spent. It is, of course, to be noted that town governments are composed of all-the-year-round residents. Their zeal to promote the town's growth, outruns their knowledge as to how it should best develop. When too late they learn that civic development does not depend so much on the amount of money spent or invested, as it does on the manner of its disbursement.

What these resort towns need to encourage is some organization along lines of local municipal art societies. Where the transient resident, who desires to build, may submit his plans for criticism or advice, or where he may be able to select a design, created with special reference to the artistic upbuilding of the neighborhood of its location.

The simple suggestion as to the necessity for some procedure of this sort should be sufficient. Those who are really earnestly desirous of effecting a necessary reform should be able to work out its details.

As a suggestion, it might be well to direct attention to the work of the Housing Board during the war. A group of competent architects spent three years in research and in the planning of communities for locations all over the grand divisions of the United States. The comprehensive reports of these well directed activities were published by the Government in a ridiculously limited edition, at once exhausted. These reports should be reprinted, made available and placed at the disposal of every community. Their use in the development of the class of resort towns to which we are referring would be of the greatest value.

THE EDITOR OF *The Architect*, of London, devotes considerable space in a recent issue to a discussion of the underlying reasons for nightmare. "We may possibly," he states, "put down many imaginative results to indigestion inadvertently or intentionally produced." It is logically deduced from that premise, that designs evidently created by a disordered mind, often called "nightmares," are the logical result of indigestion. It is admitted that the work of architects is often a nightmare and it is assumed that such conditions arise from the failure of the architect or the client properly to assimilate some mental or artistic food.

Having proceeded thus far to account, in a measure, for much of the bad architectural design that is always in evidence, this writer constructively seeks to state a method of architectural education that he believes will allay mental indigestion and mark a course that will lead to calmer and more rational periods.

Attention is directed to the fact that medical students do not, as do artists, concentrate on the contemplation of perfection, but find their greatest joy in investigating the worst afflictions to which humanity is prone. It is by such methods they would seek to check the spread of disease and to maintain a perfectly normal physical state.

"Then," it is asked in this editorial, "should not the architectural student follow a similar course?" In other words, the student might be taught how not to do it, and would find the best training in the offices of the mediocre practitioner.

This suggestion has all the charm of originality and will no doubt greatly interest that large number of the architectural profession who are now seeking to devise some better curricula for our architectural schools.



WEST FAÇADE
HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.
DWIGHT JAMES BAUM, ARCHITECT

(For first and second flaor plans see page 308)

WEST APPROACH

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

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WEST PORCH

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

300[3]

VIEW ALONG FRONT FAÇADE, EAST SIDE
HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.
DWIGHT JAMES BAUM, ARCHITECT

3004

THE AMERICAN ARCHITECT—THE ARCHITECTURAL REVIEW
VOL. CXXI, NO. 2391 APRIL 12, 1922

ENTRANCE ON EAST SIDE

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

REAR OF WEST SIDE, WINDOW OF DINING ROOM IN FOREGROUND

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

300 6

DETAIL OF WINDOW

SERVICE PORCH

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

3007

7

WINDOW ENTRANCE FROM LIVING ROOM TO TERRACE

GARAGE FROM SOUTHEAST

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

906
8

DINING ROOM

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

MANTEL IN LIVING ROOM

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

BREAKFAST ROOM

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

300"

11.

LIVING ROOM DOORWAY TO HALL

STAIR HALL

HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

300 12

12

AN OLD ALCAZAR GARDEN, CORDOBA, SPAIN

IT WAS ABOUT THIS QUAINT OLD FOUNTAIN AND ALONG THE OVERGROWN PATHS THROUGH WHICH COLUMBUS WALKED WITH QUEEN ISABELLA WHILE URGING HER TO FURTHER HIS ENTERPRISE OF DISCOVERY

(*See "Gardens—Old and New" by Francis Howard*)

300 13

VIEW IN THE PRIVATE GARDEN OF THE MARQUIS DE VIANNA, CORDOBA, SPAIN
THE SUNLIGHT AND SHADOW ON VINECLAD WALLS AND GARDEN BOTH CREATE A BEAUTIFUL ENSEMBLÉ

(*See "Gardens—Old and New" by Francis Howard*)

14
360

STAIRWAY LEADING TO A TERRACE IN AN OLD ALCAZAR GARDEN AT CORDOBA, SPAIN

*(See "Gardens—Old and New" by Francis Howard)*

A PRIVATE GARDEN IN CORDOBA, SPAIN

AN EXAMPLE OF THE ACCOMPLISHMENT OF A MOST ARTISTIC EFFECT BY THE USE OF THE SIMPLEST MATERIALS

(*See "Gardens—Old and New" by Francis Howard*)

16.

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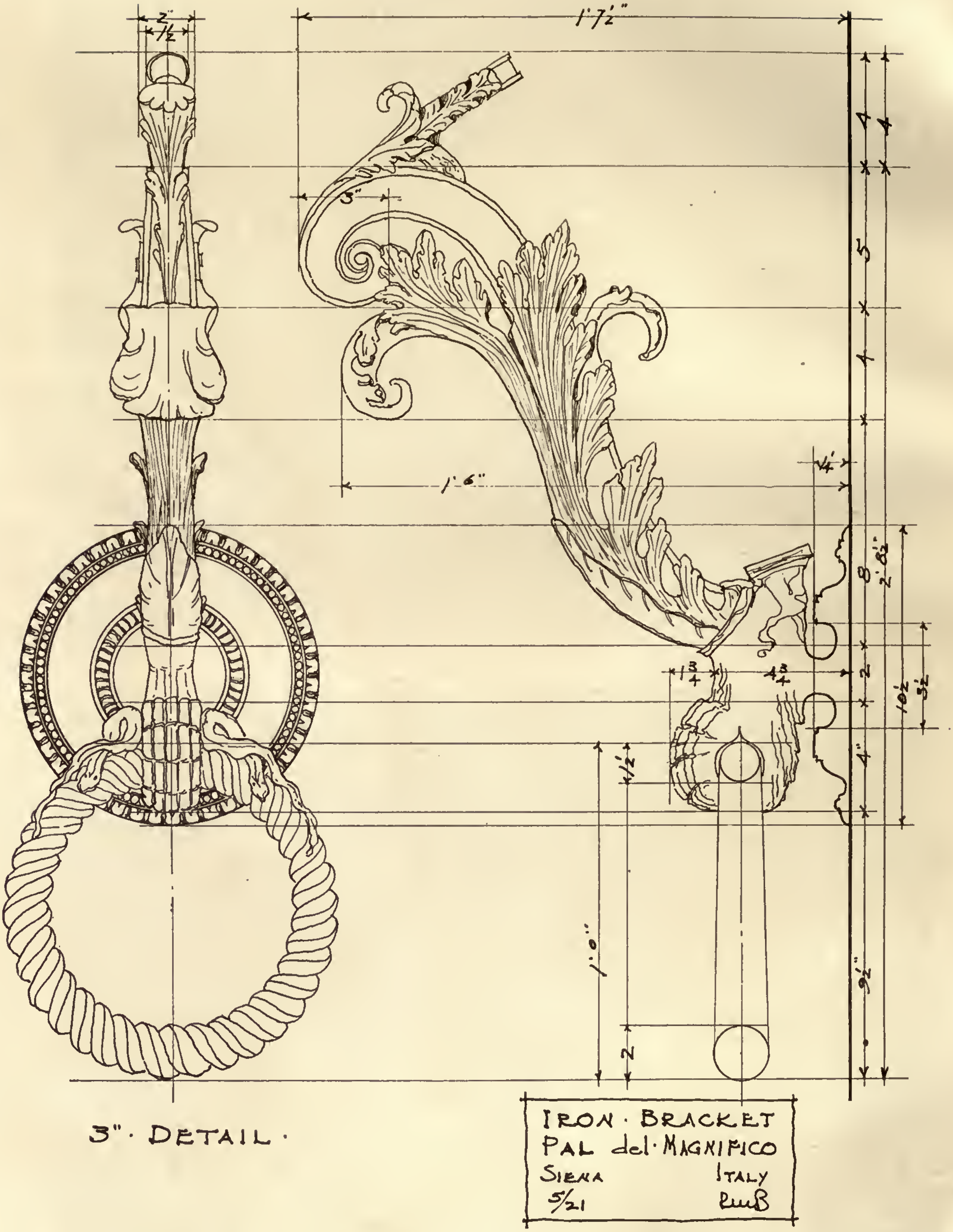
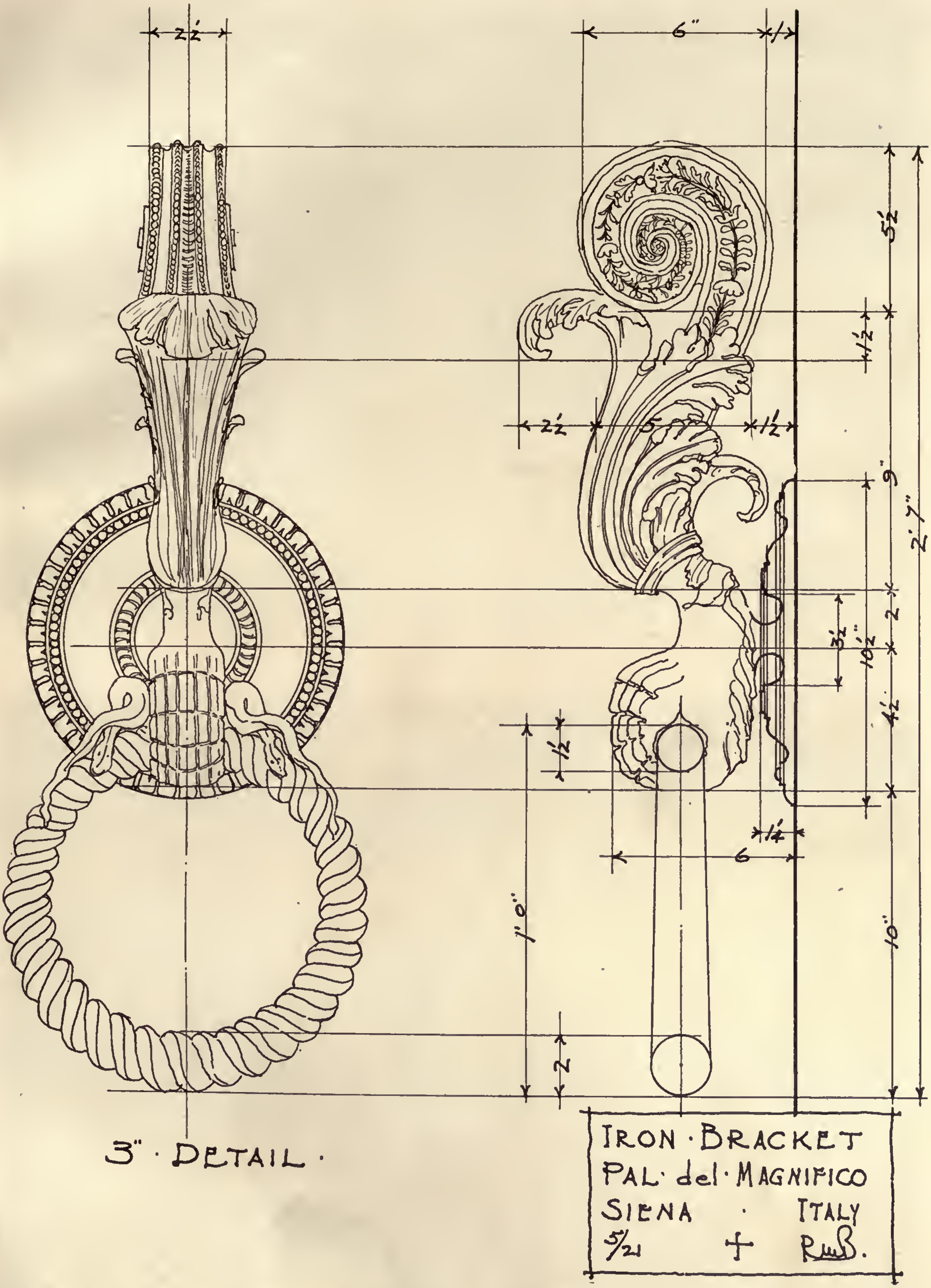
IRON BRACKETS, PALAZZO DEL MAGNIFICO, SIENA, ITALY

THE AMERICAN ARCHITECT, SERIES II.
FRENCH AND ITALIAN DETAILS




MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELLING SCHOLARSHIP




MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELLING SCHOLARSHIP

*THE AMERICAN ARCHITECT, SERIES II.*
*FRENCH AND ITALIAN DETAILS*

LIVING ROOM

DINING ROOM

HOUSE OF DUDLEY D. SISHER, NEW YORK CITY

TAYLOR & LEVI, ARCHITECTS

MANTELS IN HOUSE OF DUDLEY D. SISHER, NEW YORK CITY

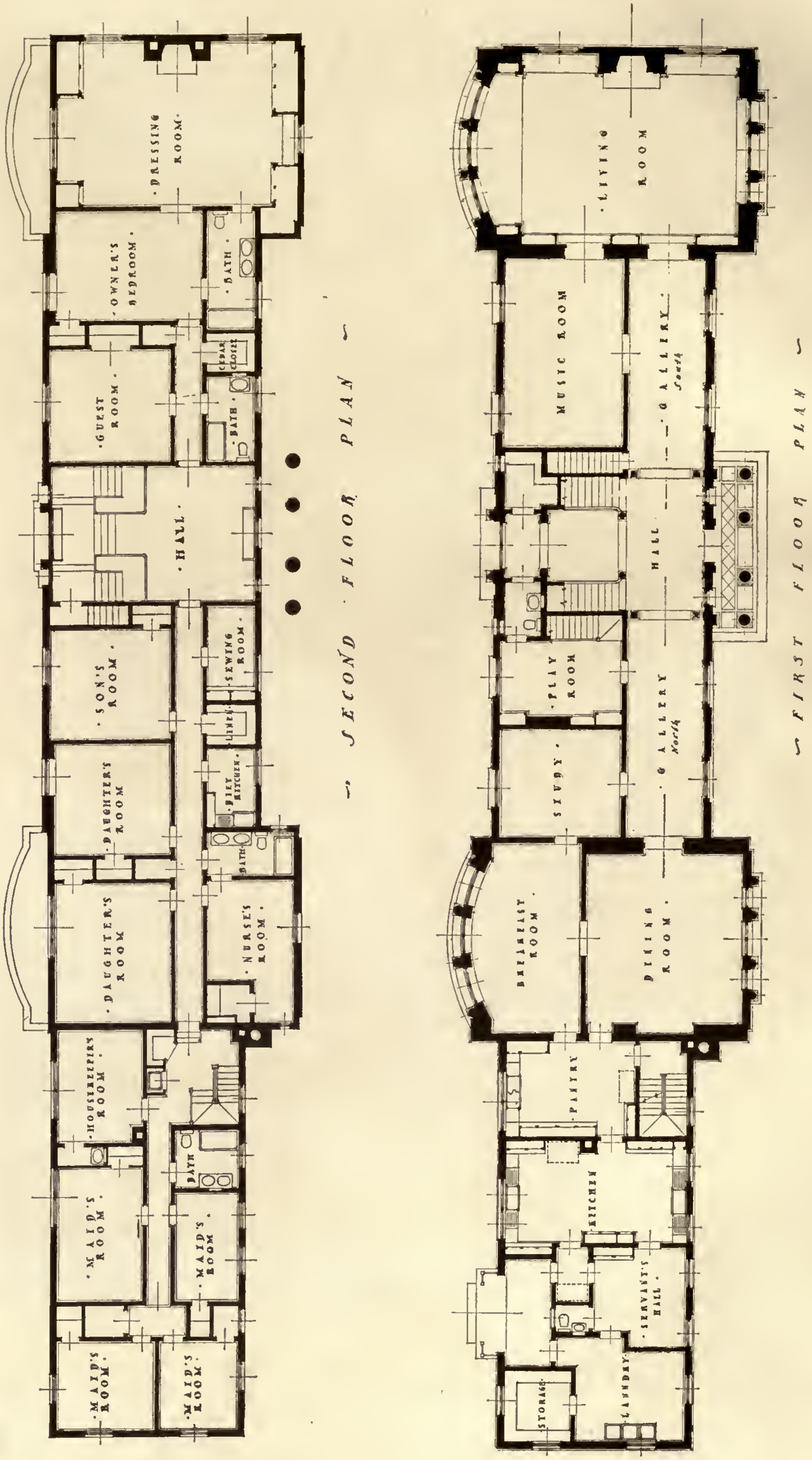
TAYLOR & LEVI, ARCHITECTS

HALL IN HOUSE OF DUDLEY D. SISHER, NEW YORK CITY

TAYLOR & LEVI, ARCHITECTS

STAIRWAY IN HOUSE OF DUDLEY D. SISHER, NEW YORK CITY

TAYLOR & LEVI, ARCHITECTS




HOUSE OF WM. P. HOFFMAN, ESQ., RIVERDALE, N. Y.

DWIGHT JAMES BAUM, ARCHITECT

*(For exterior and interior views see Plate Section)*

# LEGAL DEPARTMENT

Conducted by

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

LAST month in these columns I had occasion to note the fact that the employment of an architect is a contract of so-called personal employment, and, as such, terminable at will by the employer, subject, however, to the right of the architect to hold the employer liable in damages for any breach of contract.

The fact that the relationship between client and architect is a personal one, gives rise to a very interesting question: To what extent can an architect delegate his authority to others?

It is and has long been a firmly established rule and the law of England and of this country, that an authority founded on the personal equation and dependent for its exercise upon the discretion and judgment of the one to whom it is granted cannot be delegated by the latter to another.

This rule is based on good sense and good law. If you employ a certain lawyer to draw your will, because you believe that he is especially skilled in that branch of law, you would not expect him to delegate all responsibility in the matter to another. In the case of the employment of a physician, the personal element is even more accentuated, and so in all cases of professional employment the employer depends—to a greater or less extent, but somewhat, always—on the personal judgment, character or ability of the professional man whom he employs.

It is equally manifest, however, that there are many details of a professional man's duties which can be delegated to his assistants without in any way endangering his client's interests. The full scale drawings, for instance, carrying into effect the scheme evolved by the architect, can be turned out by proper draftsmen, without the client's interests suffering because it was not the hand of the architect that actually guided the pencil. Even in the case of the will, if the lawyer asks a competent clerk to prepare a draft and then personally passes on it and makes corrections, when necessary, the client's interests are fully protected. The completed work represents the judgment of the lawyer and not simply that of his clerk.

And so there have grown up in the law, certain well-recognized exceptions to the ordinary rule. Generally speaking, where an act is purely ministerial, as distinguished from discretionary, it may be delegated to another. The copying of drawings and the transcribing of testimony are obvious instances of such ministerial acts. Another exception to the rule is in the case of an established custom or trade usage.

There is such a custom and usage in the architectural profession—and long has been. The early decisions in England, referred to, failed to recognize the common sense of the matter, as distinguished from the strict letter of the law, and held that an architect or engineer must himself personally make measurements and computations and attend to all the similar duties entering into the preparation of plans and specifications and the superintendence of the work. Gradually the rule was broadened, however, and the necessity and justice of a more liberal construction realized. Today as the law has developed and the custom of the profession has become established, the architect may turn over to others practically any of the details of his work, the preparation of sketches, plans, and specifications and the superintendence of the work, always provided, however,—and this is of fundamental importance—that he retain the general oversight and control of what is done, and remain the directing and over-seeing mind and force.

While the practicalities of the situation have been recognized in this way, there are many cases where the architect cannot safely delegate his powers to another. He cannot take advantage of the liberality of the rule in its application to his profession to slough all real responsibility. The client in the ordinary case depends upon his artistic ability and expert knowledge. He must be diligent to see that in delegating work to others, he yet retains such oversight and control, that the design made and work done properly represent his own conception and judgment. He may select competent designers, but the designs should take form under his guidance. He may employ competent supervising assistants, but if the work is not properly superintended, he must respond in damages to the owner for all defective work resulting from the improper discharge of their duties by his subordinates.

Where a special contract provision is inserted, to the effect that the architect may or may not delegate all or any of his powers and responsibilities, this provision will control, and no amount of general custom will allow the parties to depart from the clear terms of the agreement which they have made.

In general, the architect will do well to follow the conservative course and, in the absence of specific permission from his client, not delegate his authority or discretion to others in those cases where there can be any question of his right to do so. A simply but properly worded clause in his contract with his client will meet the needs of ordinary situations and allow the architect to make full use of his office staff and organization without exposing himself to the charge that he has turned over to others the performance of work which he should do himself.

## LEGAL DECISIONS

THE building contract provided for the construction of a building on a cost plus ten per cent basis. It further provided that "the estimates of the contractors made in writing from completed drawings and specifications and full information, will be correct to the extent that the cost will not exceed the estimate more than five per cent." Before the execution of the contract, a letter was written to the architect by a contractor, giving an estimate much lower than the actual cost at which the building was erected. The letter was not made part of the executed contract, and no express reference was made to it in the executed contract. The owner later sued this contractor, claiming that he had been overpaid by the difference between the amount paid him and the amount of the estimate contained in his letter. The court held that the letter, under such conditions, could not serve as a basis for determining the owner's rights against the contractor; that to make a building contract valid, it must have the necessary element of certainty just as in the case of all other contracts; that a contract may be made sufficiently certain to come within this rule if it contains proper references to other documents or plans or specifications. Each such reference, however, must be sufficiently definite and clear to identify the documents or plans or specifications to which reference is made. The letter in this case not having been referred to in this way and so sufficiently identified, the contract, on the basis of the letter as claimed by the owner lacked the necessary element of certainty and was not valid and the owner could not recover.

*Brown-Randolph Co. v. Gude et al,* 106 *Southwestern* (*Georgia*) 161.

THE sub-contractor brought suit against a contractor for the amount due him under his contract. The contractor claimed that the work of the sub-contractor had been defective and withheld the payments due the sub-contractor. The latter refused to make good the defects of which the contractor complained and refused to continue with the work. The contractor completed the work of the sub-contractor at a cost in excess of the contract price. It appeared that there were a number of defects in the work of the sub-contractor, but that they were minor defects and that he had complied with his contract in all substantial particulars. The court held that a substantial compliance on the part of the sub-contractor with the terms of his contract was sufficient; that the defects were immaterial or not defects for which the sub-contractor was responsible; that the contractor could not recover from the sub-contractor the cost of completing the work after the sub-contractor's refusal to continue, and that in an action by the said contractor for the amount due under his contract, the burden was on the contractor of establishing his right to offset against the amount due the sub-contractor the cost of completing the work.

*Henslee v. Mobley,* 230 *Southwestern* (*Arkansas*) 17.

THE Charter of the City of Seattle provided that "no contract shall be sub-let except for the furnishing of material, without the previous consent of the City Council." A contractor for city work sub-let the contract for labor and for superintendence in certain excavation work for the piers of a bridge. The City Council did not consent to the sub-letting of the contract. The sub-contractor abandoned the work when it was substantially one-half complete, and claimed the right to recover against the contractor on *quantum meruit,* viz: for the reasonable value of the work done, irrespective of the amount of the compensation named in his contract. The court found that a contract had been made between the contractor and the sub-contractor in the sense that their minds had met and that they had agreed on the essential terms. The court held that the contract was voidable by either party at any time, prior to the City Council giving its consent to it, and that the sub-contractor, accordingly, had the right to consider it as voidable and abandon the work, as he did; that the contract, while voidable and so in a sense against public policy, was not, however, to be classed with contracts which are considered void in the law or voidable because they are "immoral" contracts, and that inasmuch as the parties had proceeded under it, the compensation to be paid to the sub-contractor would be measured by the contract, and that he would not be allowed to recover a larger amount on the theory of *quantum meruit;* that inasmuch as the amount paid to him at the time when he abandoned the contract was substantially one-half of the total amount of the contract, and inasmuch as substantially one-half of the work had then been done, he had been paid in full and could not recover anything further.

*Dyer etc. v. Pederson,* 192 *Pacific* (*Washington*) 1002.

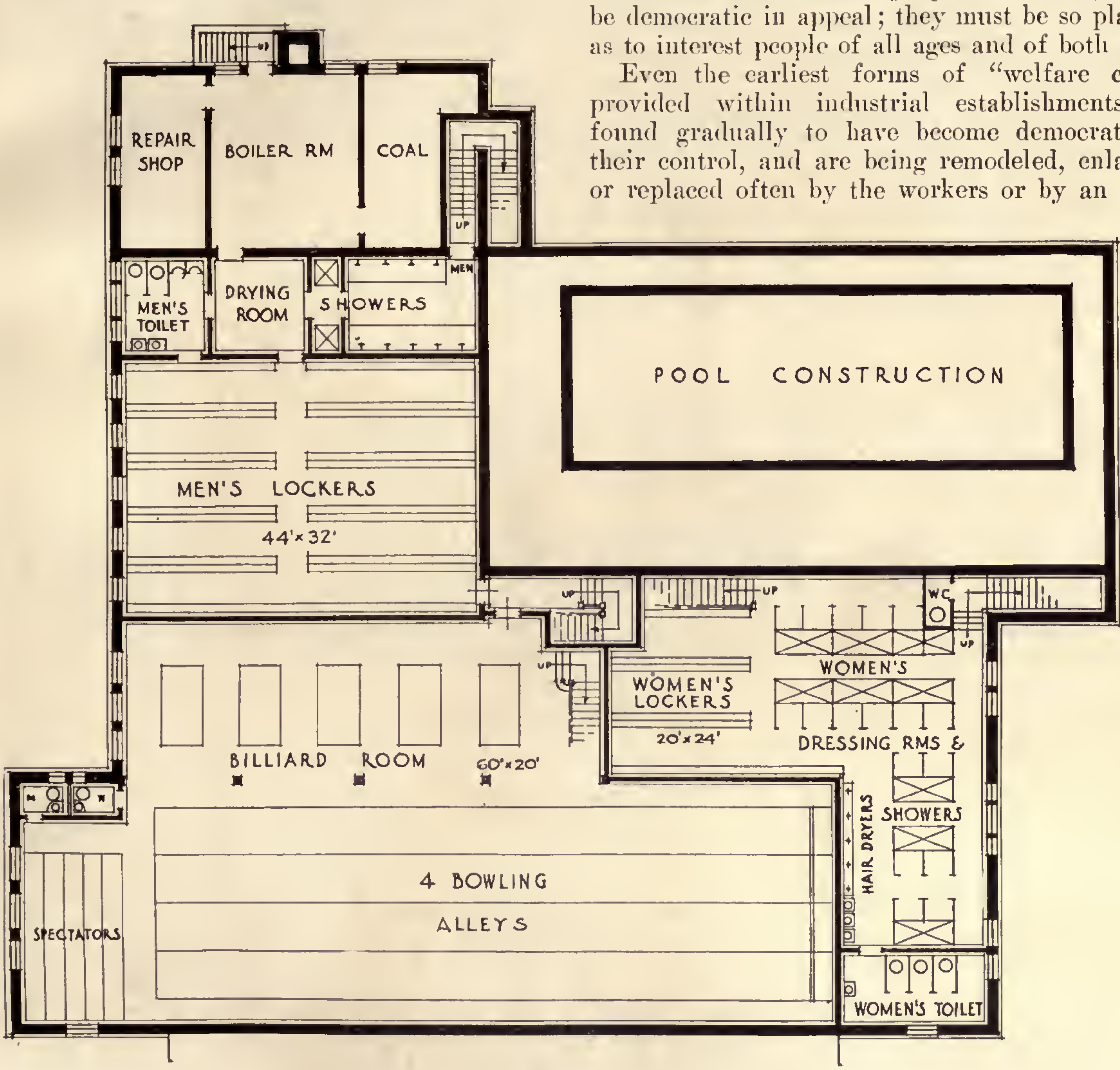
# COMMUNITY BUILDINGS FOR INDUSTRIAL TOWNS

BY MARTHA CANDLER

THE industrial center club building is not a new idea either in this country or in Europe, but there are strong present day tendencies in such buildings which are a definite post war development. How marked these tendencies have become may be observed by a study of "Community Buildings for Industrial Towns," a publication just issued "to meet the needs of a large number of industrial organizations, individuals and communities."

This publication, the result of studies of the whole field made during 1921, is largely a discussion of some carefully chosen examples of such buildings from the standpoint of architecture, administration and scope of activities. There are conclusions to be drawn from it which cannot fail to interest the local architect. Notably: there is a large and steadily increasing demand for industrial center buildings; these buildings, even when financed solely by the industry, must be democratic in appeal; they must be so planned as to interest people of all ages and of both sexes.

Even the earliest forms of "welfare clubs" provided within industrial establishments are found gradually to have become democratic in their control, and are being remodeled, enlarged, or replaced often by the workers or by an intra-works organization representing the employers and the employed. The latter, no less than the former, have "come to realize more fully the significance of recreational activities which identify the worker with community life. . . . The community house, where the worker in his leisure hours meets the people of the neighborhood who




BASEMENT PLAN

COMMUNITY BUILDING—SCHEME "B"

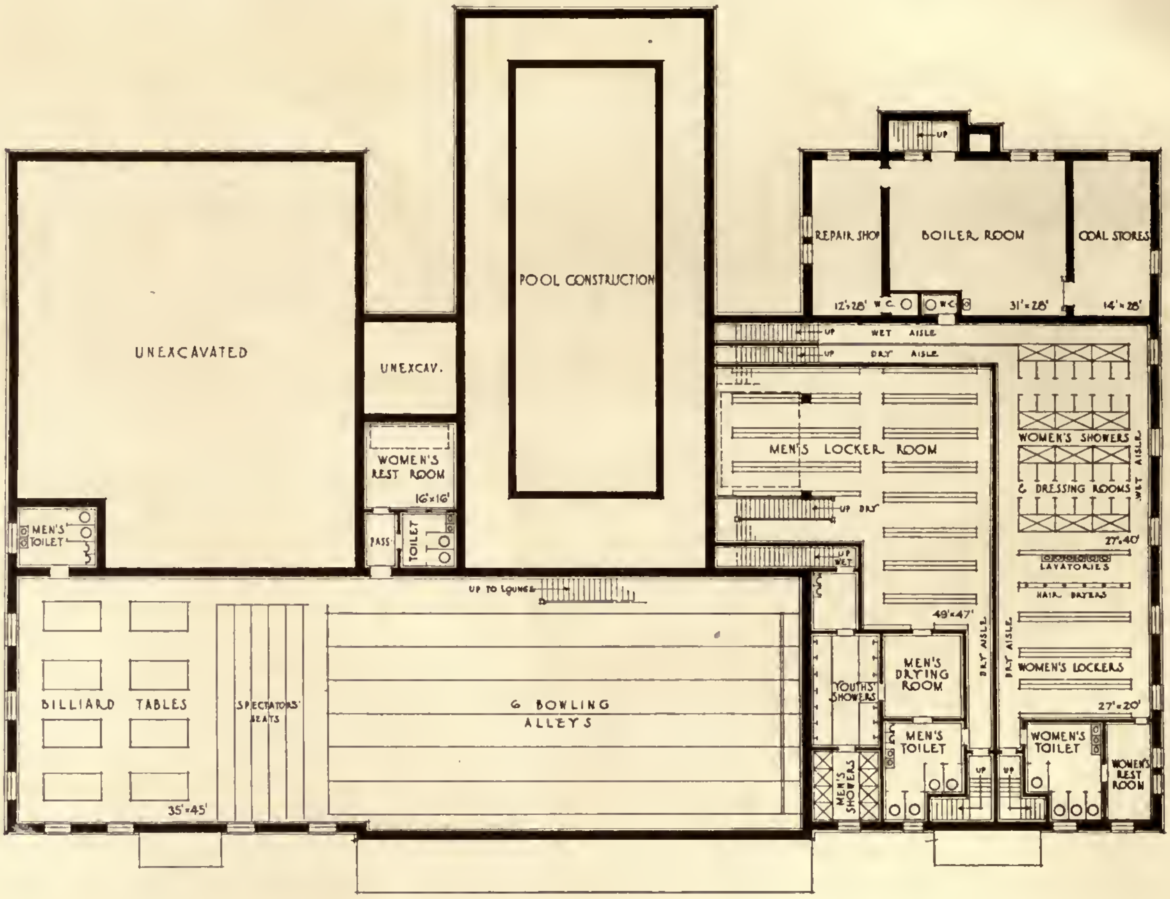
JALLADE, LINDSAY & WARREN, ARCHITECTS

may or may not be associated with him in the industry, helps to provide an outlet for the normal instincts of sociability and companionship."

Those responsible for the newest and most distinctive developments in industrial center social buildings have been noticeably alert in incorporating into them just those features which have contributed most to the success of the memorial community buildings of the country. While nothing approximating a standard of community house architecture has developed to date, a study of the World War "memorials of democracy" the country over will show that there is a well defined minimum of requirements for the building of a given type. These requirements, adapted to the situation under discussion, are admirably set forth in "Community Buildings for Industrial Towns" in the form of full floor plans for three buildings ranging in price from $45,000 to $275,000.

It goes without saying that the local situation demands of the architect as well as of the industrial heads or of the local building committee, a knowledge of the most modern developments in social buildings. It may be added, that it demands as well at least some degree of social mindedness on the part of the architect if these buildings in the aggregate are going to develop into something really fine, into a genuine contribution to the social life of America. If the auditorium, for instance, is successful as a gymnasium, it will inevitably develop an enthusiasm for indoor sports which will demand exclusive gymnastic facilities,—bowling alleys, a swimming pool, a running track. To whom but to the architect would it occur that even the choice of the building site should be such as to permit of additions to the building of future excavation for a basement floor? Or that the back stage theater dimensions must be planned to conform to modern "little theater" requirements, if the local dramatic group is to expand? Or that the kitchen must be so placed as to be easily accessible to large and small rooms for the service of hot food, if hospitality is not to be thwarted?

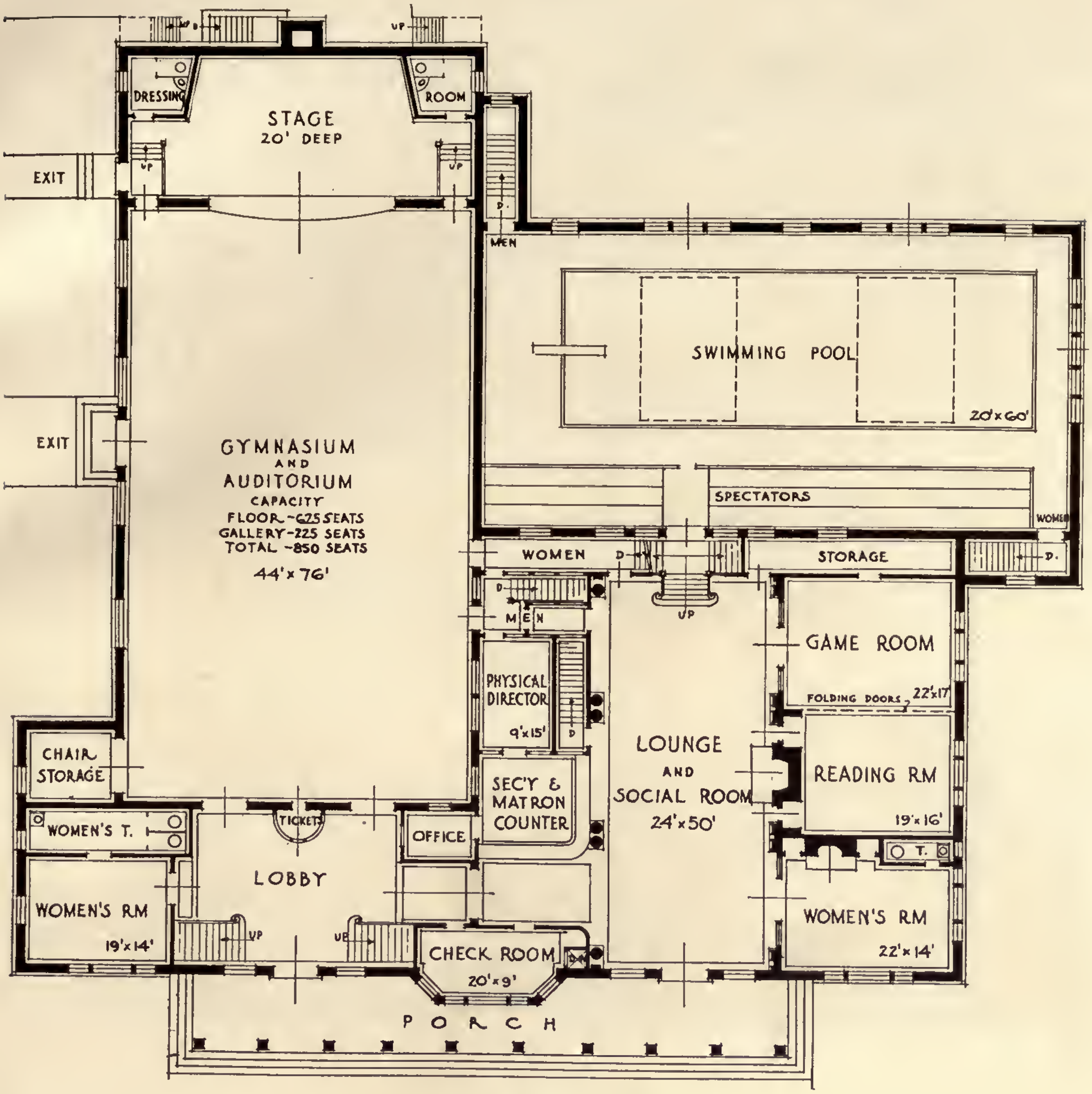
On the four following pages the first and second floor plans, as relating to the various schemes discussed, are reproduced and the notes of the architects also appended.




BASEMENT PLAN

COMMUNITY BUILDING—SCHEME "C"

JALLADE, LINDSAY & WARREN, ARCHITECTS




FIRST FLOOR PLAN

COMMUNITY BUILDING—SCHEME "B"

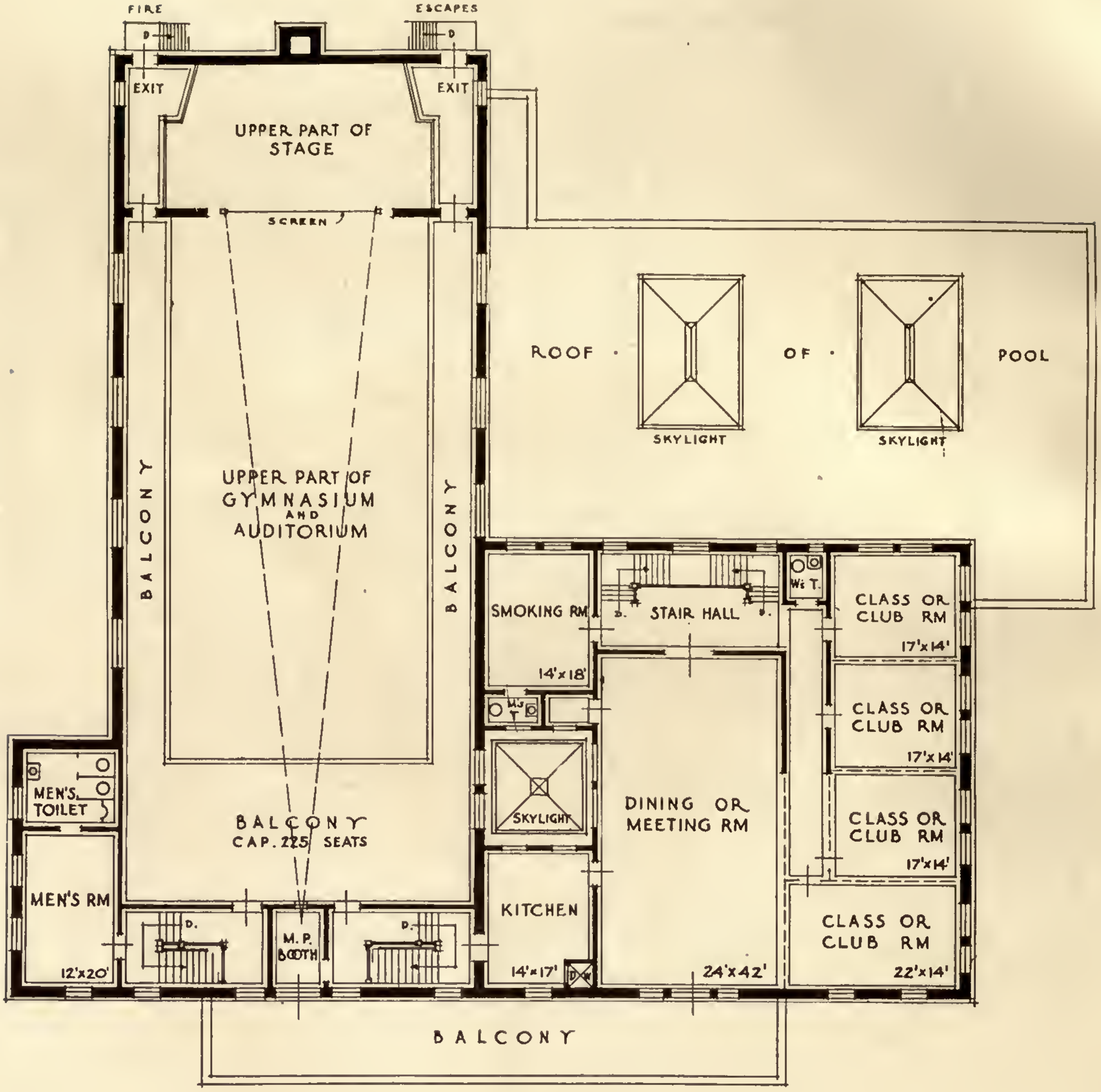
JALLADE, LINDSAY & WARREN, ARCHITECTS

SCHEME B requires a lot 136 by 136 feet. The auditorium and gymnasium are combined as in the former plan. In this case the room has a seating capacity of about 625 exclusive of the balcony, and a playing space 76 by 44 feet. There is a balcony on three sides increasing the seating capacity by about 225.

The building is so arranged that the auditorium may be used without opening the rest of the building, and vice versa. A retiring room for women adjoins the lobby of the auditorium, and a similar room for men is on the balcony floor. A checking room at the entrance to the auditorium is so located that it may also be used from the main lounge. A large general lounging room with fireplace is the central feature of the street floor. Adjoining it are the offices, women's room, game room, and reading and writing room. Folding doors between the game room and the reading room make possible a meeting room 33 by 20 feet. The secretary's desk is so located that he may have ready oversight over all parts of the ground floor.

This plan includes a swimming pool 60 by 20 feet reached only from the shower rooms in the basement. There is a spectators' gallery to the pool, reached from the main lounge.

The basement contains space for four bowling alleys, five billiard tables, and a large number of lockers, showers, and dressing rooms for both sexes. Entrance to the locker rooms and shower baths is controlled from the secretary's desk.



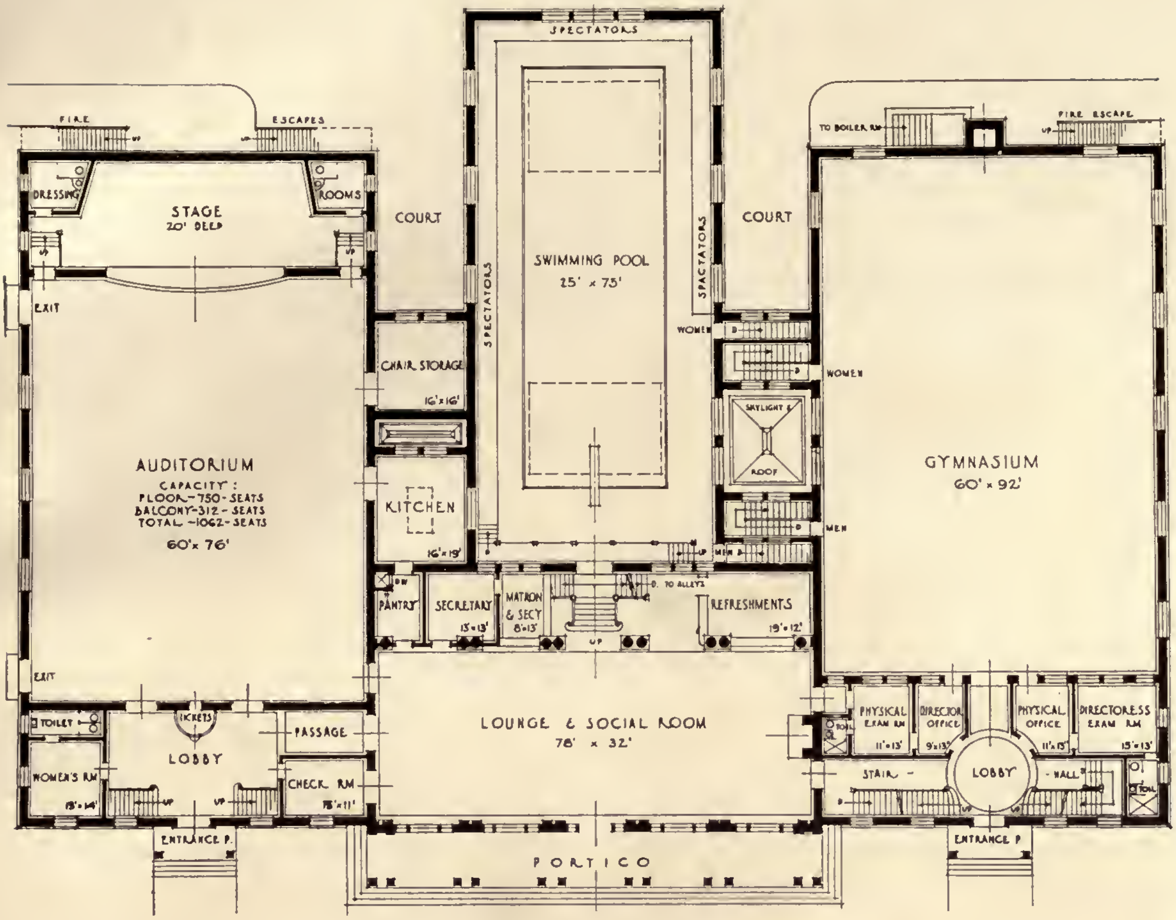

SECOND FLOOR PLAN

COMMUNITY BUILDING—SCHEME "B"

JALLADE, LINDSAY & WARREN, ARCHITECTS

THE second floor contains the men's smoking room, four class or club rooms, a kitchen and a dining or assembly room 24 by 42 feet. The capacity of the dining room may be increased fifty per cent by opening the folding doors of two of the club rooms. A dumbwaiter in the kitchen as planned would facilitate the serving of refreshments on the street floor. Built with masonry foundations, wood exterior frame above the first floor level, and wood construction throughout, it would cost about $125,000. With masonry foundations, brick exterior walls, wood floor joists and plain finish throughout, the cost would be about $135,000 to $140,000. If the exterior walls have a stone trim, and the first floor is of fireproof construction the cost would approximate $140,000 to $145,000. Fireproof construction throughout would cost about $158,000.

In addition to janitor service, this building would require the employment of at least one man and one woman on a full time basis so that there would always be one at the desk or nearby, while the other would have charge of the gymnasium and the swimming pool.




FIRST FLOOR PLAN

COMMUNITY BUILDING—SCHEME "C"

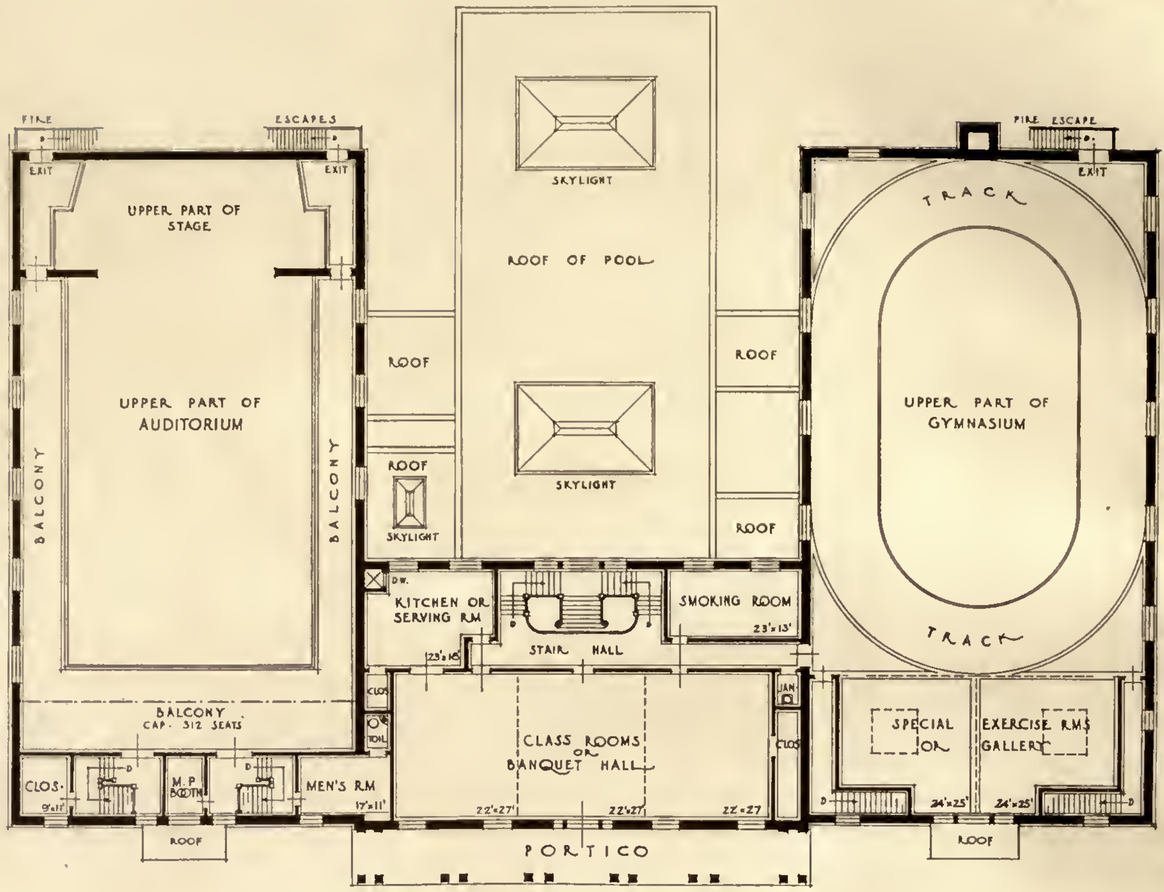
JALLADE, LINDSAY & WARREN, ARCHITECTS

THE industrial town with a population of 18,000 to 30,000 will find provision for meeting its leisure time needs adequately made in the building shown in Plan C. With masonry foundations, brick exterior walls, wood floor joists, and plain finish throughout, the cost would be about $235,000. If the exterior walls have a stone trim, and the first floor is of fireproof construction, the cost would approximate $245,000 to $250,000. Fireproof construction throughout would bring the cost to between $260,000 and $270,000.

This building requires a plot 204 by 160 feet. There are two stories and basement. The auditorium has a seating capacity of about 750 on the main floor and the balcony will seat 312. The stage is provided with a dressing room and a lavatory on each side. Ticket office, women's retiring room, and checking room adjoin the entrance lobby of the auditorium and a kitchen is so placed that it may serve either the auditorium or the other parts of the building. The auditorium may be entirely shut off.

On the opposite end of the building is the gymnasium, 60 by 92 feet, with a balcony on four sides which is suitable for a running track. The entrance to the gymnasium leads by the office of the physical director which is connected with the examining room and directors' lavatories. Across the lobby is the office for the women's physical director or swimming instructor, with examining rooms and lavatories.

Between the auditorium and the gymnasium at the front is the main lounge 32 by 78 feet, adjoined by the office, the kitchen, and the checking room. This lounge connects the entrance to the auditorium with the entrance to the gymnasium.




SECOND FLOOR PLAN

COMMUNITY BUILDING—SCHEME "C"

JALLADE, LINDSAY & WARREN, ARCHITECTS

A SWIMMING pool 25 by 75 feet is so placed that it may have a good supply of sunlight. Skylights may be used to advantage. Entrances to the pool are through the shower rooms only, insuring a complete check of everyone who reaches the floor of the pool. A spectators' gallery entirely separate is reached from the main lounge.

The basement provides lockers, showers, dressing rooms and service rooms. There are also six bowling alleys with well arranged seats for spectators, six billiard tables and adequate lavatories.

The second floor provides men's room for auditorium; auditorium balcony and motion picture booth; serving room connected by dumbwaiter with kitchen; smoking room, and two rooms which may be opened up for spectators when a race is being held on the running track. There is also a social or banquet hall 66 by 26 feet which may be divided by means of folding doors into three large club or class rooms.

# RETROSPECTIVE OF AN ARCHITECTURAL EDUCATION

BY MERRILL DENISON

AFTER having spent seven years of comparatively hard and certainly sincere work studying to be an architect it is disconcerting to discover that an expensive and elaborate system of education has not only failed to fit one for its avowed purpose but has actually given one certain viewpoints and a romantic incapability which is an actual detriment to a successful prosecution of architecture, as has been the experience of the writer of this article.

Most embryonic architects are brought face to face with the same conclusion shortly after they enter an office following graduation. Simply because most of them accept the situation without militant comment seems to the writer to be a very poor reason for perpetuating a system of technical training which has such a number of inherent defects. He feels that his seven years of study at least has earned him the right to criticize if it has taught him virtually nothing concerning the subject he was supposed to be studying.

On considering the viewpoints of those who practice architecture and those who teach it one finds an amazing anomaly. The first is a realist; the latter a romanticist. To the practicing architect a brick is one of the elements which enter into the erection of a building; in the minds of those teaching the subject and hence to the student there is no such thing as a brick. A brick as a single entity finds no existence in the school but in the plural it becomes a symbolic pattern of closely drawn lines, usually covered with a pinkish wash.

While this symbolism of the drafting board serves a cleancut purpose to the realist who is designing a building, to the romanticist who is completing a projet, it soon ceases to be a symbol or a diagrammatic expression intended to serve certain ends but gradually becomes the end in itself.

In practice architecture is an art which is concerned with realities, with bricks and stone, cement and steel, with wood and iron and which must serve the functional and material needs of the community. In the schools it is concerned with the symbols of these things alone and no continuous effort is ever made to drive home the fact that they are only symbols.

Architecture is a three dimensional art and would seem to demand for its successful prosecution a mind and imagination used to functioning in terms of three dimensions but at no time during his career does the student of architecture ever need to consider that his art has more than two dimensions. As an art it deals more completely with realities than any other and yet one might assume from an examination of the theory and practice of its training that it was concerned with nothing more than highly conventionalized patterns of lines.

As far as the necessities of the school are concerned architecture is confined to the limits of the drafting board. Where the student's mind should conceive his problem in terms of its mass standing in silhouette against the sky it works in terms of drawn lines placed against a chic rendering in which the accidental sedimentation of water-color may turn out to be, as it quite often does, the most important single factor in determining the worth of the drawing.

Where his imagination should carry him into the erected building and follow the lives of those who will use it to give him a knowledge of their aesthetic and practical needs it is generally concerned with the problem of adding unessential and trivial lines to the drawing before him which has lost its significance as a representation and has become its own *raison d'etre.*

The routine of the schools, of which there were four to which the writer went, was of such a nature that it not only did not serve the idea that a building has form and entity and has its being on the ground and in the air, but it completely distorted the whole process of realistic imagination in order to further the needs of the projet and the competitive method of judging it.

Even if the student realizes the three dimensional facts in architecture he is in no position to exploit that knowledge for his own development because of the need of accumulating credits toward his graduation and the natural demands his ambition makes on him that he be a successful competitor in the game he is playing. And "projeting," it seems to the writer, has become a kind of intricate sport. Whatever its original purposes might have been, and they were designed to serve a concrete end, the projet of today is an end in itself.

As the student becomes more proficient as a "projeter," his viewpoint becomes more artificial and trivial from a constructive standpoint until at graduation he is the master of the shadow of a great art and a relative infant as far as his ability to contribute to the art itself is concerned.

As with all romanticism a distortion has taken place in the minds of those engaged in the teaching of architecture so that the thing that is taught under that name is little better than an anaemic shadow and that, while in reality architecture has three dimensions, in the school it has but two . . . length and very little breadth.

It is true that the methods of studying the designs of a building and the work involved in completing a projet have certain points of similarity. Both require the use of pencil and paper but the approach to the two problems is so dissimilar that one finds hardly a point of contact on analysing the mood and method of procedure in tackling a projet and that of studying the necessities for a building to be erected.

In one case the drawing is an end in itself, in the other it is but a tentative step on the road. In one case the drawing will be treasured as a completed work of art and in the other will be regarded as something which has no real value in itself but whose worth must find its true fruition in the completed structure.

Both of these viewpoints are right as far as their relative intentions are concerned. This should not be the case with the student but as a matter of fact it is. To him the projet is an end and a very definite one. He soon learns to regard it as the most important single factor with which he has to deal in his school life for he finds that all the other studies die of inattention when a projet is nearing completion.

The projet is a thing in itself as well as its own end and it has relatively little to do with design as it is found in the office. For one thing, the slightest hint of economic fact or limitation is never allowed to intrude itself into the teaching.

There is something quite beautiful in this desire to shield the student from the cold, sordid facts of life as they touch the architect and to allow him to dream and draw in a well protected ivory tower of the magnificence and splendor of pure art but as one who dreamt and then awoke with a pretty severe shock, the writer would have preferred reality . . . or a little of it.

It is true that the architectural school does provide a better aesthetic training than any other course open to a young man or woman desiring a broad, general education—one that is infinitely superior to and much less vitiating than a liberal arts course. Even the hectic necessities of the charette have the value of developing in a person the ability to approach any situation with directness and simplicity and solve it with vigor.

But what, exactly, is the function of the architectural school? If it is to impart a broad and sympathetic culture, then a great deal of time and energy is unnecessarily wasted in developing a strange and exotic type of draftsmanship which really furthers no ends but its own. If the projet, as it exists today, must be retained it should be accepted for what it is and its involved technique and rules given a simple codification so that the student, early in his career, might become initiated in its tricks and short cuts, so that he might embrace more completely the broad and sympathetic culture he is seeking and which the school offers.

The writer would suggest, as the first step in reforming the school so that it better fits the cultural assumption, that some master technician in the art of "projeting" should bring out a book or guide after the manner of the sporting manuals in which he would clearly set forth the purposes of the projet, its conventions and the rules regarding it, both national and international. It would probably find a ready translation into French.

Such a book would frankly admit the two dimensional facts concerning the drafting board and would place in the student's hands certain invaluable hints to shorten his labors. There would be a chapter, for instance, on all those devices like the photo-stat process and rubbing half a drawing across where a building is symmetrical about its axis, so that the student would acquire the essential facts directly and not accidently as he does at present.

A special consideration should be shown to the form of short hand known as indication in which the Corinthian cap, for example, becomes a simple quick gesture involving two and up and down lines, a couple of rapid twirligigs at the corners and a slash of the pencil in the middle.

Trees and their uses would fill a considerable part of the work. For school purposes there are three trees which are the most important architectural elements known. Think for a moment what architecture in the schools might degenerate into if the poplar, with or without holes, were declared illegal or if that amazing tree were done away with which has the versatility of a stock actor and which looks something like a poplar but can work double as a fountain by simply bending its top a little.

Consider where the "Ecole" would be today were it not for that strange blobby growth that appears in front of those portions of a building which are distinguished by their badness or by the fact that they are not there. The blobby tree has probably done more to make the world safe for architectural hypocrisy than any other single thing.

Skies and the various methods of getting them on paper would have an important place because they will often make or mar a projet. It has always seemed a delicious farce to the writer, that solemn study and worry with which all architects in or out of the schools, approach the sky. He recalls working on a great competition once. The building was designed and drawn carefully on sheets of Whatman. All the facts necessary to a visualization of the completed structure were put down in black and white and then a professional renderer was called in. He put eighty-six consecutive washes on the sky with an air brush. It took three days to design the building and five days to design the sky.

The foregoing reformist views have been based on the assumption that the primary purpose of the architectural school is to provide a general education and are designed to free the student by providing him with information which he seldom acquires now before his senior years and so free him, in part, from those labors which distort the true purposes for which he goes to the school.

If, however, the architectural school, in addition to the aesthetic side, is to equip a man with the ability and knowledge to be of actual service in the professional field without first going through a long period of painful readjustment, then the importance of the paper side of architecture is even more malicious and a radical and revolutionary change must be brought about.

This change must be accomplished by one of the three factors involved. The student, the faculty of the school, or the practicing architect. The student may be eliminated. He is more or less under the mature dominance of the other two, he is certainly not responsible for the present condition of affairs and has little chance of learning how bad they are while he is still a student.

It is first essential for the faculty to realize that their viewpoint is the romantic one which, while it might have an abstract justification, is immoral as long as it demands, for its complete flowering, the sacrifice of a portion of four years of effort from every student who comes within its scope. The faculty must see clearly that they have been turning out drawers of drawings and not builders and designers of buildings.

Where architecture is concerned with bricks, they have been concerned with paper and pencil and water color. Not once in the writer's entire school career can he remember suggesting that a building might have an actual corner to it. It only had sides (as a rule, only one) a plan and a section, all unrelated to each other—especially the section.

The practicing architects must lend themselves, their experience, their sense of reality to the faculties. They must open their offices to the needs of education and bring into the schools a cold, sane knowledge of what architecture is all about.

Both must accept with brutal frankness and as few protective apologies as possible the fact that a further continuation of the present unsatisfactory mode and philosophy of architectural education is criminally unfair to the rising generations of students as it has been unfair to those that have passed.

The writer realizes that he has touched on but a few points in a highly complicated subject and that his desertion of architecture because he had too great a respect for the most magnificent of all arts to foist upon it another incompetent, may be used as an excuse to lessen the essential honesty of his criticism. He knows, however, that present conditions are wrong, that they need correction and that the first thing to do towards a betterment of present conditions is to liquidate the error which exists today in teaching that architecture, a thing of entity, function and form, is nothing but an involved pattern of black lines on white paper sentimentalized by a few daubs of water color.

Silk Batik Overmantel, Jean Paul Slusser, Painter
From the recent exhibition of The Architectural League of New York

# DEPARTMENT OF SPECIFICATIONS

Concrete Specifications—(*Continued*)

THE subject discussed in the last article in this Department had to do with the specifications for concrete up to the erection of forms.

It might be well to call the attention of the reader to the Joint Committee Report on specifications for concrete which was published last year. At the outset it must be remembered that specifications given in this report are tentative only and so far as is known these specifications have not received the approval of the constituent members of the Joint Committee. Anyone writing specifications should have a copy of this report and should study it very carefully as it no doubt will have a very great deal to do with the correct and adequate preparation of specifications in the future. Members of The American Specification Institute have received a copy of the specifications prepared by that body which are based on the Joint Committee Report and it would be of benefit to readers of these columns to familiarize themselves with these specifications. Inasmuch as the Joint Committee Report covers all phases of concrete structural work and a great deal of plain concrete work such as foundation walls and floors, it might be discouraging to the specification writer to attempt to write a totally new specification based on the tentative specifications in the Joint Committee Report.

With this thought in mind, and the further thought that suggestions given now may be of value for operations that are to be gotten under way in the immediate future, the points presented in this article that merit the consideration of the specification writer should be accepted as being subject to whatever revision might later on be necessary because of any revolutionary method of procedure based on the final report of the Joint Committee. There are many operations of small magnitude that could not readily be put under the Joint Committee's specifications without a very thorough education of the architect, the specification writer, the contractor, and the various material men concerned with the fabrication of concrete. It is not to be supposed that one should be satisfied to go along with specifications that might be inadequate while waiting for some final determination by the Joint Committee. If it is possible for the specification writer to improve his specifications to some extent at the present time, he should do so.

While the forms for concrete are being erected it is very possible that the erection of steel must be done simultaneously in order that the form work may be built around it. In this case the steel may be supported on structural steel columns or it may be intended that they be supported by and built into reinforced concrete columns. If structural steel is to be erected by the contractor for the structural concrete work, the specifications for forms should be followed by specifications for the erection of structural steel. The subject will be gone into more fully in a later paper so nothing more will be said of this work at this time.

Upon the completion of form work all interior spaces or forms should be cleaned of all rubbish and should be prepared to receive the reinforcing. It might be well to state here (although this has more to do with actual supervision of construction work than the writing of specifications) that forms enclosing spaces which are to be filled with concrete should be so built that the cleaning out of high spaces of narrow width may be accomplished from the outside and at the base of the form. If such arrangements are made the specification writer may have greater assurance that the forms will be cleaned out than if no such provision for facility in cleaning has been made.

When the forms have been cleaned out they must be inspected, although actually this inspection will be made from time to time as the sections are completed and made ready to receive the concrete. However, the sequence of operations calls for a specification covering the inspection of forms at this place. This inspection should cover the location of all forms of suspension for pipes, suspended ceiling, furring, or other items that require hanging devices to be placed on the concrete. It will also cover the location of insects, sleeves, thimbles or any one of the numerous other items that must be built into the concrete. Inspection must also include the actual dimensions of the forms and whether corners that are liable to be broken upon removal of forms have been provided with triangular strips to form bevels. If any of the items that are to be built into concrete require precise placing, the specifications must call for supervision of this work by the contractor supplying the items or supplying the work which will be connected to or suspended from the things built into the concrete. In cross-index fashion, a memorandum at the same time must be made in the specifications for piping trades, for furring and lathing, and miscellaneous iron or other trades, that such things must be furnished to the concrete mason or must be placed on or within the forms by the contractor furnishing them before the concrete is placed. As a general rule, the hangers, inserts and similar items are manufactured so that the removal of forms will not be retarded or made difficult by the nature of the piece set in the concrete. It will be well, however, to check back against the selected devices to make sure that this condition obtains or that the specification for forms indicates that certain difficulties or certain preparations must be taken care of at the time the forms are built.

FOLLOWING the paragraph covering inspection of forms, the next series of paragraphs should cover the placing of reinforcing. It is to be understood that reinforcing may be bought in either one or two ways—first, delivered on the job with all straight bars cut to length and all bent bars cut and bent to proper shape, or second, that bars are all delivered straight with bending to be done on the job. In speaking of bars it may be considered that many reinforcing materials that are used in numerous places will be delivered under either one of the above methods. The choice of method, of course, will be determined by the local customs, although it is doubtful whether very much bending of bars is now being done on architectural construction work. If the reinforcing material is being furnished by another contractor (as is often the case under the separate contract system) the concrete specification must be specific in this connection, so that the contractor will not be forced to combat a demand that he bend bars that he would rightfully assume would be received bent if the specification only said that he was to receive and install all the reinforcing material shown on the drawings that would be furnished by another contractor. If any bending is to be done on the job such work must be specified in particular so that no difficulty will occur.

Regardless of whether the contractor for concrete work, or in the case of the separate contract system, the contractor for reinforcing steel, is to furnish the material, one or the other of them should be required to furnish the media for the support and spacing and proper holding in place of all the reinforcing material. The specifications must require that such items be furnished by someone and so placed that the position of the reinforcing will not be altered from that shown on the drawings. This matter of support and separation or spacing of reinforcing is quite important, especially with respect to bars, and the specification must be quite clear as to the demands of the specification writer in this respect.

In some cases certain types of devices manufactured to supply these things may be objectionable because some portions of them will be visible after the forms are removed. The specification writer should be familiar with the different types of these accessories that will be available in his district so that he will be prepared to rule out any devices that for one reason or another would not be acceptable. If no exceptions are made in the interpretation of specifications, the interpreter should not be expected to reject any accessories that have, to say the least, a negative approval.

If the reinforcing steel is to be furnished by another contractor and is to be received by the contractor for concrete work on the job, these specifications should require that each shipment of reinforcing material be checked against shipping invoices and placed in racks or otherwise disposed of so as not to be in the way or in such a position that other material would be piled upon it. There also should be provision that the superintendent will check quantities and shapes for bent bars, together with lengths of straight bars in order that discrepancies might be discovered in plenty of time to permit the substitution of correct material.

All of the reinforcing material should be placed in the forms after the forms have been cleaned out and inspected and in many cases after items that are to be built in, have been placed in final position. The reinforcing should be placed in strict conformity with the indications of the drawings and the various accessories such as spacers and supports be placed so that distances in all cases will be correct.

At times it is necessary to form bar splices on the job. The splices should be made only in the structural members of minor importance and should not be made without the consent or without the instructions of the person who designed the reinforcing work.

Regardless of whether or not the drawings for concrete reinforcement show the distances of the bars from the edges of concrete, the specifications should require that certain minimum distances be kept, more on the basis of fireproofing requirements rather than of design requirements, with respect to the distance of the reinforcing from the compression side of beams or slabs or otherwise. The writer is reminded at this point of one specification he saw not very long ago which required that all rods must rest on the forms. Needless to say, the building had not been completed before it collapsed. Just as a safeguard, it would be well to include in the specifications a clause for reinforcing of various types such as for beams, girders, columns, and slabs be placed a certain minimum distance from the forms, this distance not to be increased unless the drawings so indicate.

Upon completion of the placing of the reinforcing material, each section should be inspected and then released for the placing of concrete. A clause covering this requirement should appear in the specification in order that some control of the time of commencing the pouring of concrete may be had, otherwise incorrectly placed reinforcing might be covered up before the inaccuracies are discovered.

In warm weather it is necessary to wet the forms immediately before the placing of concrete. This wetting of forms not only helps to prevent the rapid absorption of water from the concrete but it also does very well as a cleaner of the forms if provision has been made to remove the debris from the bottom of the forms. The specifications should require that the forms be drenched in warm weather but not, of course, in freezing weather. To some extent the details of this work must be left to the discretion of the construction superintendent.

If steel structural members are present and are to be fireproofed with concrete, it is possible that they must be wrapped with caging of some type such as wire mesh or any patented flange or web caging in order to hold the concrete fireproofing around the beam in an adequate manner. This material ordinarily is furnished by the contractor for the concrete structural work but in the interests of accuracy it is best not only to have these things shown on the drawings, but to specify them for all such cases.

WE will suppose that the building being built in our mind's eye now has the forms all ready to receive the concrete with reinforcing and various accessories that are to be built into the concrete properly positioned, the forms drenched (if in hot weather) and all other items taken care of in a correct manner. Next in sequence comes a series of paragraphs relating to the proportioning, mixing and placing of concrete, and care of newly deposited concrete. The first step in sequence is that of the proportioning of concrete.

The first item to be determined in the specifications for concrete proportioning is the unit of measure and because of the convenience to be had, the usual unit of measure is based on the package of cement, whether it be a paper bag of one-quarter barrel, or whether it be a full barrel. In any case the unit of measure must be fixed not only for each material, but for the condition of each material—that is to say, the cement should be measured as delivered on the job in its packed condition, while the fine and coarse aggregate should be measured as placed in the measuring box. The usual rules of proportioning are supposedly based on the measuring of materials as just suggested. The use of cement shipped in bulk has become popular for some purposes in the past few years and the specification writer might find it well to cover the matter of measuring bulk cement according to the local customs for operations of varying magnitude.

Common usage has decreed that concrete that is to be reinforced should be mixed in the proportion of one part cement to two parts fine aggregate to four parts coarse aggregate when the various constituent materials are of average good quality. A study of the Joint Committee Report will reveal the fallacies inherent in blind adherence to this common understanding. Much can be said against the proportioning of concrete in this manner but on the other hand it cannot be said that architects and contractors are now ready to make universal use of the extremely fine methods of proportioning that are presented in the Joint Committee Report. This is not to be understood to be in criticism of the excellent methods of proportioning presented for consideration in this report, but it is simply calling the attention of readers to the fact that unless they are thoroughly familiar with the methods outlined in this report, they should follow closely the rules or proportion that through their practice seem to have produced concrete of good quality. The proportions for reinforced concrete and for plain concrete for various uses all should be specified and not left to the determination of the contractor or of the architect's superintendent on the job.

If hydrated lime or any integral mix is to be put in the concrete its quantity in proportion to the cement should be specified at this time. The quantities selected should be chosen in accordance with accepted practices as determined either by the manufacturers of the materials used or through tests conducted by responsible research laboratories.

The water to be used in the mixing of concrete should be specified to be clean water—that is, potable. Local conditions may require that the specifications covering water be gone into more throughly but ordinarily clean, potable water is generally accepted as being of sufficiently good quality for concrete. If the word "clean" is used, it is rather nonsensical to say that water shall be free from dirt or other foreign matter, and if it is potable it must be assumed that there is not a great amount of alkali in it.

Next in sequence should come the mixing of the concrete. All concrete should be mixed by a machine except where the operation is very small, in which case hand mixing would be resorted to. It is extremely improbable, however, that an operation so small that a machine mixer would not be used would be the subject of specifications. It is supposed, and by far the best practice requires, that all concrete will be mixed by machine.

Professor Duff A. Abrams, of the Structural Materials Research Laboratories of Chicago, has made very exhaustive tests on the proportioning and mixing of concrete and has determined that if concrete is mixed for about one minute, the quality ordinarily is about as good as could be expected. Some specifications have been somewhat strict in the matter of the number of revolutions of the drum. Professor Abrams' investigations indicate that if the drum revolves from twelve to about twenty-four times per minute there is not very much variation between concrete mixed at the low rate and that mixed at the high rate. Below the minimum and above the maximum revolutions there is a variation that gradually becomes greater and more fraught with danger in the case of minimum revolutions or more useless expenditure of mechanical energy with respect to the maximum

*(Concluded on page 332)*

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## INTERESTING STRUCTURAL DETAILS

### Examples of articulation between reinforced concrete and structural steel in recent structures

BY ELWYN E. SEELYE*

THE use of reinforced concrete combined with structural steel rather than constructing buildings entirely of one material or the other is becoming a common practice. This combination of the two materials offers interesting problems in connection with the articulation of structural steel with reinforced concrete.

Where reinforced concrete girders rest on structural steel columns it is necessary to provide more bearing area than is required for the seats of structural steel beams, because the concrete is so much weaker in compression than steel.

The building out of these seats to provide ample bearing area would require that they possess considerable bending strength on account of the distance of the center of gravity of the bearing from the face of the columns. This in turn would require rather expensive details and brackets, or gussets, would be apt to cut into the architectural clearances. For this reason the writer has adopted a detail of multiple seats as illustrated in Figure 1.

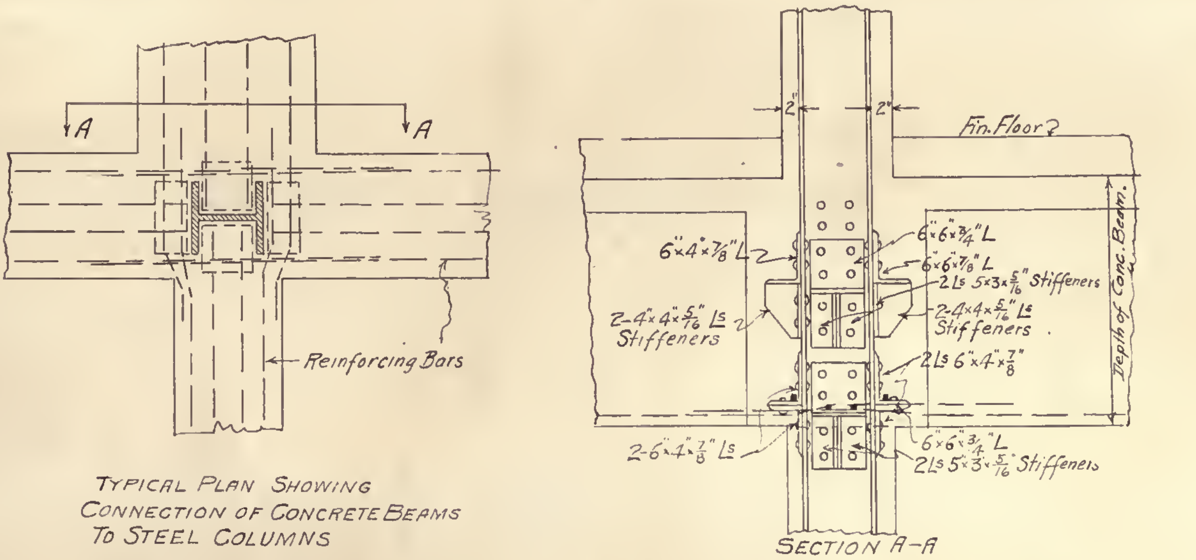



Fig. 1—Detail showing multiple seats used for reinforced concrete beam supported on steel column. University of Buffalo, Chemistry Building. McKim, Mead & White, Architects; Elwyn E. Seelye, Engineer

It is often advisable to carry up a structural steel column for a certain distance and then to start in with a reinforced concrete column. Here again it is necessary to spread the top of the steel column in order to provide sufficient bearing area for the concrete column. This may be solved by the use of a billet designed for bearing, bending and shear, which design will not interfere with architectural clearances. This is illustrated in Figure 2.

Another use of reinforced concrete is for the strengthening and articulation of additional story steel, as for example where a building is to be increased in height.

The addition of structural steel plates to an existing column presents a rather expensive problem

*Consulting Engineer, New York City.

not only on account of the necessity for cutting old rivets and drilling new holes in the old steel, but also because it is difficult to carry this reinforcement past the connections of an existing tier of beams. For this reason it will often be found more economical to surround the existing structural steel with a reinforced concrete column and either figure the column without reduction for long column action or to figure the column as a reinforced concrete member, the existing structural steel forming part of the vertical reinforcement.

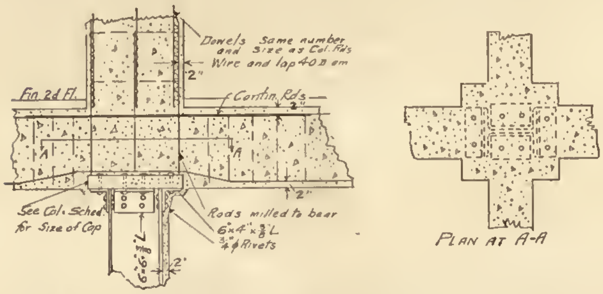



Fig. 2—Top of steel column and foot of reinforced concrete column. Combustion Engineering Office Building, New York City, Ludlow & Peabody, Architects; Elwyn E. Seelye, Engineer

The connection for an additional story column on top of an old steel column is an expensive and difficult problem if the joint is made directly between the old and new steel. This is because of the field work required to make the splice and also the accuracy in measurements required in order to have the new steel fit properly.

These difficulties may be circumvented by the use of a reinforced concrete cap upon which the new column may be set with anchor bolts in a similar manner to that used in setting new columns on a concrete foundation. This is illustrated in Figure 3.

The connection for a concrete beam resting on a steel girder provides no particular difficulty except that anchor rods should be provided to hold the concrete beam firmly to its flange bearing. This should also be done in the case of stone concrete slabs resting upon a steel beam, unsupported laterally, as might be the case of a steel facia girder of a balcony.

Less usual cases of articulation are those where a steel beam frames into a reinforced concrete column or girder. The only caution required here is to see that the concrete entirely fills the space between the flanges of the steel beam so that direct compression stress in the case of a column and the compression and shearing stress in the case of the girder, are transferred by bearing through the web and flanges of the steel beam.

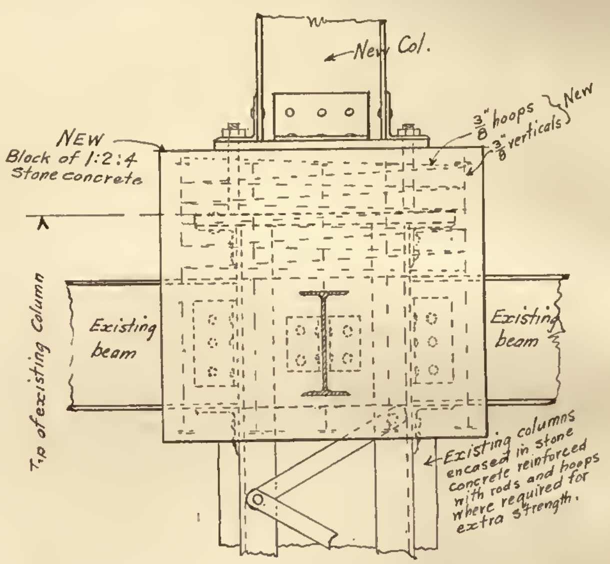



Fig. 3—Detail of connection for extension of existing columns for additional Floors, 15 Exchange Place, Jersey City. W. L. Stoddart, Architect; Elwyn E. Seelye, Engineer

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# ELECTRICITY IN THE HOUSE

## IV — THE KITCHEN

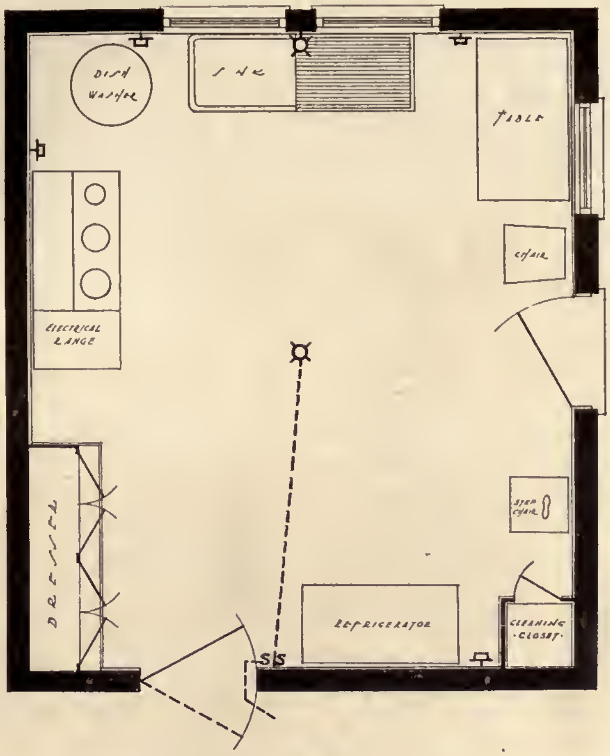
BY M. O. WHITTON

FROM a modern woman's standpoint, it is almost impossible to over-emphasize the importance of having a well planned, well equipped kitchen. As long as the serving of three meals per day remains a household necessity, just so long will women rate the success of a house plan by the ability of the kitchen suggested to fulfill that household's standards of hospitality.

Curiously enough, the original kitchen planners in this country, apparently were not women, but the architects responsible for the laying out of kitchens in hotels, restaurants and large private establishments, where speed and ease in serving are prime requisites. Kitchen planning for the ordinary private home developed as kitchen employees departed, and next we hear of state agricultural schools trying to improve the kitchens of farmers' wives, with a view to lessening the amount of work falling on the shoulders of the rural housewife. Finally, as the domestic service shortage began to affect homes formerly considered comfortable, a perfect fever of scientific kitchen planning spread through all the household magazines, and prizes were offered, here, there and everywhere, for the development of model kitchens,—food laboratories, one is almost inclined to call them, especially when electrically equipped.

Through all the differing details of this multitude of model kitchens projected on paper, certain general ideas prevail, first, ample provisions of light and air; then, elimination of waste motion, and finally a most modern conception, proper mechanical equipment to eliminate drudgery and unnecessary hard work. In all of these three elements, electricity plays a prominent part; thus it becomes apparent, that in designing a good modern kitchen, its adequate electric wiring must receive most careful attention.

Merely to enumerate some of the electric kitchen utensils now available will give some idea of the sort of thing that has to be borne in mind in laying out the wiring of a present day kitchen. To aid in the preparation of meals on a large scale, there are electric grinders for meat, coffee, bread crumbs and the like; there are vegetable parers, ice cream freezers, bread mixers, and cutters, etc.; while for more ordinary home use, there would be a utility motor, or "kitchen aid" or some similar power device, which can be adapted to do most of the things for which hotels and restaurants need separate machines. For cooking, there is the possible use of the electric, the gas-electric, or the coal-electric range; there is the electric fireless cooker, and the host of smaller aids, such as the waffle iron, toasters, and coffee percolators. Nor should the possibility of making frozen deserts in the ice compartment of the electric refrigerator be overlooked. For post-prandial activities, there are several types of dish washers to choose from, such as the combination table-and-washer, the combination service-table-and-wagon, and the washer with a permanent plumbing connection. The considerations which govern the selection of kitchen equipment are logically those of the amount of space available, the size of family to be served, and the general scale of living to be provided for. It is not necessary, however, for the architect to concern himself with the details of such machines, as long as he considers their possible use when he designs the wiring for a kitchen.




CEILING OUTLET · BRACKET OUTLET
BASE RECEPTACLE S SWITCH

A Kitchen wired to meet modern demands becomes a food laboratory

In selecting a plan to illustrate an adequate wiring scheme, no effort has been made to portray the culinary department of a large mansion or small hotel, but rather to proceed upon the less imposing basis of the kind of kitchen one is likely to find in the moderate sized home of the better type. The size chosen, 12 by 14 feet, is in accord with present day space economies, yet is entirely ample for the daily requirements of a family of five or six. Given a kitchen of this size, well equipped with kitchen appliances, it becomes capable of serving many more, especially the occasional formal dinner to a few friends.

The room shown is well provided with daylight, the north side being now usually preferred by architects for a kitchen location. As, however, practical considerations require the use of the kitchen beyond daylight hours, adequate artificial illumination must also be furnished. For general lighting in a room of this size and nature, one fairly large unit located against the ceiling (unless it be an extraordinarily high one) will supply a very satisfactory working light, free from shadows. A well painted, and well washed white ceiling will do much to improve the efficiency of the fixture selected, while one large bulb of the high-efficiency type will be found economical in operation.

This central fixture will supply all the general lighting needed for kitchen work, with one exception, and that is for dish washing. In the view of the average housekeeper, it is impossible, for obvious reasons, to have too much light on the subject of plate cleaning. The sink, therefore, is placed under the windows, and is accorded a special lighting bracket as well. In this kitchen, one drain board, to the right of the sink, is shown, the place of the second drain board being taken by an electric dish washing machine to stand at the left of the sink, and to be operated from the receptacle, shown at the point. In the corner of the room is the kitchen table, well lighted from the windows on two sides. (In an apartment, rather than a suburban house, the side would probably not be available, and any possible deficiency in lighting could be made up for by an additional lighting bracket placed in the window location shown here.) To the left of the table, another receptacle is indicated, designed for the operation at the table of such devices as the utility motor for grinding, polishing, bread and batter mixing, and the like, while in many cases, the kitchen table itself would be wired.

On the unbroken side wall is placed the range, which in cities where special cooking rates are available, will probably be electric on account of its great economies in cooking, cleanliness and fineness of regulation. Where an electric range is to be used, special wiring must be provided to carry the heavier current needed for the operation of the range. In passing, it may be said that the electric range, together with the heavier types of electric radiator, and possible electric heating for an ironing machine, are the only pieces of household equipment which cannot be operated on the ordinary lighting circuit. Smaller types of radiators, electric stoves, ovenettes, fireless cookers, combination stoves, etc., almost *ad infinitum*, require no special wiring beyond that ordinarily designed for a house,—assuming that too many of these devices are not operated at once.

Should it be desirable, kitchen odors can be carried off by placing a small electric fan above the range in connection with a flue. This fan would be supplied from the same receptacle that controls the stove. This ventilating provision is not usually required in a modern well aired kitchen, unless an enormous amount of cooking is being done in it for the size of the room. Usually, too, most housewives supply a fireless cooker in which the most odoriferous of our ordinary viands are reduced to inoffensive eatables. The remainder of this wall is taken up by the kitchen dresser, for which there are no special electric requirements.

To the right of the dresser is the door leading into the butler's pantry, and to the left of this door are the lighting switches controlling the fixtures in both that and the kitchen. Beyond the doorway is the refrigerator, hopefully an electric one, in which case, it will be operated from the receptacle shown next to it. The remainder of this wall is taken up by a cleaning closet, next to which, space is allotted for a step chair, and a small easy chair located next to the door of the porch or rear entry. (In an apartment kitchen this additional exit would be omitted, and the arrangement would be slightly shifted accordingly.) For work at the sink or kitchen table, a high stool is generally found more satisfactory than a chair because it is less bulky and is more easy to handle. It will be noticed that the entire center space is left free and unencumbered for swift movement.

In discussing receptacle facilities in this room, the term baseboard outlet has been purposely avoided, for many kitchens are wainscoted, tiled, or otherwise panelled up for several feet from the floor, in which case it will be found much better to locate the outlets in this elevated position, rather than in the baseboard itself. Not having to stoop to the floor to connect or disconnect makes for the ready use of electric appliances, and constitutes a saving of time and effort appreciated in a busy kitchen.

Finally, it will be noticed that no possible provision is made for laundry work in the kitchen. The writer knows not of one thing more conducive to household efficiency and peace, than the complete separation of laundry and kitchen work. If necessary, it is better to reduce the size of the kitchen, or arrange some space in the cellar, in fact to do almost anything else, rather than to have clothes washed in the same room in which three meals a day are to be prepared. Laundry work done by modern machinery, need no longer be an onerous task, and certainly, with a well planned kitchen at command, three meals a day cease to be a life sentence at hard labor. But the respective requirements of these two functions both in time and space are so widely divergent, that, with rare exceptions, they can only be successfully handled in separate quarters.

# ORIGINS OF FIRES AND CONFLAGRATIONS

THE Burlington Building in Chicago has a height of 15 stories with a frontage of 175 ft. on Clinton Street which is 80 ft. wide and 150 ft. on Jackson Boulevard which is 66 ft. wide. It is commonly spoken of as a fireproof building because the structural members are of metal protected with clay tile and concrete. It is used for office purposes and the large office areas with partitions constructed to interfere as little as possible with light and air made it possible for furnace-like temperatures to develop, once a fire might obtain good headway. The street fronts contain as much window area as it was possible to secure. The windows were of plain glass with wood sash and frames. The owners never dreamed of the possibility of flames attacking this building across wide streets, but on the side and rear wire glass set in metal frames was used on alley walls as a protection against exposure fires.

On the night of March 14-15 a fire started in an unsprinklered 2-story building on the southeast corner of Jackson Boulevard and Clinton Street. A light northeast wind prevailed and the fire spread rapidly southward to adjoining 7-story sprinklered buildings occupied by companies engaged in light manufacturing, printing, book binding and publishing. The intense heat opened all sprinkler heads and the tanks were soon empty. Then the flames shot across the 80-ft. street and gained access to the Burlington Building through the plain glass windows with wood sash and frames, at the level of the eighth floor. Half the contents of the building were destroyed. The building was not sprinklered and once the fire obtained a start it cleaned out the upper floors.

The day after the fire the elevators were running up to the fifth floor. On that day the bank offices on the first floor were prepared for occupancy as were five of the lower floors for officials of the road. Three days after the fire the sixth and seventh floors were ready for occupancy and on the fifth day after the fire the eighth floor was turned over to tenants. It is reported that most of the damage to the eighth and lower floors was caused by water and business was but slightly interrupted. Many valuable records were destroyed.

The building after all merits the claim of being to a high degree fire-resistive. A report is promised in the near future and the lessons such fires teach will be published for the benefit of architects and engineers. The exposure fire from which the Burlington Building suffered originated in non-fireproof buildings housing industries which were serious fire hazards. It is reported that the fire is believed to have been incendiary in origin.

In this connection a bulletin issued March 20, 1922, by the National Lumber Manufacturers' Association is interesting as it contains an analysis of the 1921 Report of the Committee on Statistics and Origin of Fires, of the National Board of Fire Underwriters. The bulletin may be had by all who are interested enough to ask for it. The summary on the last page is given here to show that carelessness and dishonesty keep pace with improvements in methods for obtaining a high degree of fire resistance in buildings. The lumbermen believe the annual fire loss will be greatly reduced when proper attention is given to control of hazardous occupancy and the carelessness of occupants.

SUMMARY OF REPORT

| Type of Building | Number of each type in cities | | Number of fires in each type |
|---|---|---|---|
| Reinforced Concrete | 2589 | | 163 |
| Fire Proof (Steel Frame) | 3421 | | 92 |
| Brick and Stone | 283432 | | 6877 |
| Iron-Clad | 2809 | | 136 |
| F R A M E | 944494 | | 15637 |
| Concrete Block | 5305 | | 148 |
| Buildings not classified | 12112 | | 336 |
| Total Buildings | 1254192 | Total Bldg. Fires | 23389 |
| | | Other than Bldg. Fires | 11108 |
| | | Total Fires | 34497 |

75.3% of all buildings were frame.

1.65 fires per 100 frame buildings.

2.43 fires per 100 brick and stone buildings.

2.50 fires per 100 of all buildings other than frame.

330 fires extended to the adjoining building only.

70 fires extended beyond the adjoining building.

1.1% of all fires extended to the adjoining building.

.2% or 1/5 of 1% of all fires extended beyond the adjoining building.

98.7% of all fires were confined to the building or place or origin.

Ratio of frame buildings to brick and stone buildings 3.33 to 1.

Ratio of frame buildings to all buildings other than frame 3.27 to 1.

Total loss to buildings and contents $23,707,411.

Loss caused by communicated fires 7.34 per cent. of total $1,741,108.

*NOTE—Communicated fires include some fires that did not originate in buildings.*

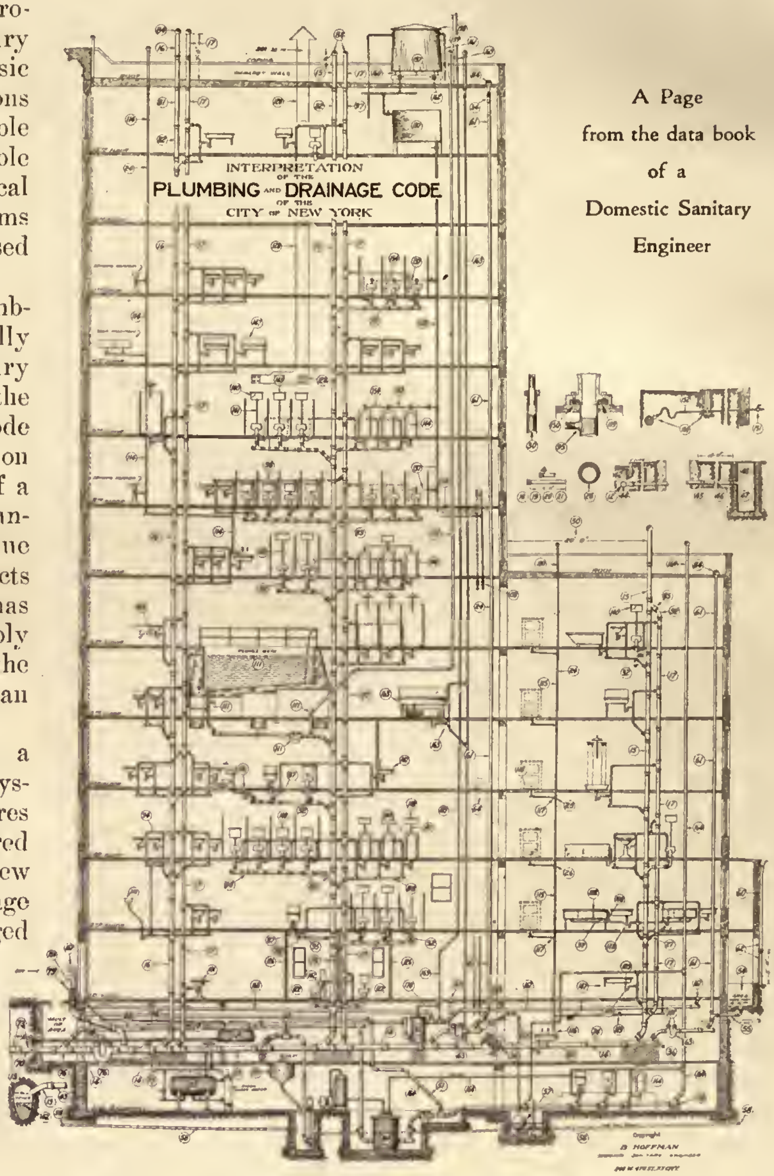
# PLUMBING AND DRAINAGE PLANS

## The New York Plumbing and Drainage Code Presented in Graphic Form

THE interpretation of all the provisions of building and sanitary codes requires a sound basic knowledge of the trades and vocations involved in addition to considerable practical experience. It is not possible always to avoid mistakes and practical men make considerable use of diagrams to shorten work and check designs based on the text of the codes.

Mr. B. Hoffman, a New York plumbing and heating contractor, who locally is well known as a domestic sanitary engineer, solved in his own practice the problem of quickly referring to code provisions by a pictorial representation which is hung on the wall in front of a designer when plumbing plans are under way. A number of requests for blue prints were received from architects who heard of the diagram and it has lately been printed in order to supply the demand. It is a useful key to the code and is of much greater service than an index.

Each connection and portion of a complete plumbing and drainage system is shown on the diagram, the figures in small circles referring to numbered paragraphs and sections in the New York City Plumbing and Drainage Code. The compiler has been engaged in plumbing work for many years and made a careful analysis of the sanitary laws of New York City where the greater part of his work was done, for the purpose of lessening errors in design and avoiding mistakes in construction.




A Page from the data book of a Domestic Sanitary Engineer

The diagram is greatly appreciated by men who are using it, for it conveniently presents for reference a vast amount of necessary information which, without this aid, would require many hours to read and understand. It should be useful in cities having sanitary codes based on the one in force in New York City. It has a place also in schools of architecture as well as in classes for plumbers' apprentices. The diagram sold by Mr. Hoffman is three feet high by two feet wide with ring attached so it may be hung like a calendar.

The idea is worth copying by architects, sanitary engineers and plumbers in other cities. The work involved in the preparation of such a chart is, in itself, splendid training for designers.

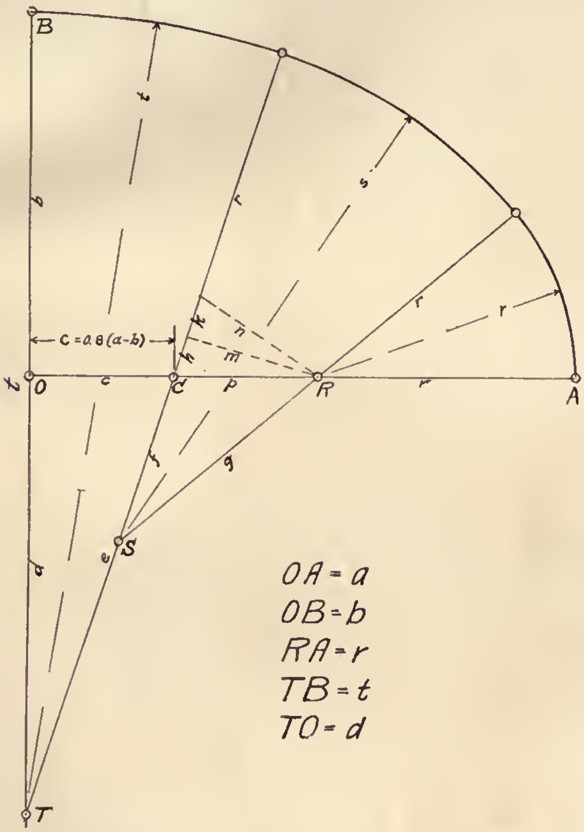
### Line Cuts from Blue Prints

NOT all architects and engineers know that to prepare drawings for engravers it is only necessary to go over the white lines on blue prints with black drawing ink. In photographing the drawing to make a zinc etching the blue is filtered out. Many of the drawings appearing in the pages of THE AMERICAN ARCHITECT and THE ARCHITECTURAL REVIEW are prepared in this manner. This knowledge may encourage more of our readers occasionally to send in details of construction, which may be inked in and reproduced without regard to other lines on the sheet containing the details.

## Laying Out an Approximate Ellipse

By David C. Coyle, C. E.*

An ellipse of the usual proportions, i. e., with length not more than twice the width, may be imitated so closely with circular arcs that the eye cannot detect the difference. The advantage of the compound curve lies not only in greater ease of drafting, but in the simplification of all the computations relating to its dimensions. This latter factor may be an important one where a structure is built of elliptical form of steel or stone which will require detail shop drawings.




An approximate ellipse laid out by the method described

The usual rules for drawing such a curve give a resulting oval which is easily recognized as a false ellipse. This is due to the fact that the radii used are the maximum and minimum radii of curvature of the true ellipse. Their arcs touch the ellipse only at the ends of its minor and major axes and as the curve leaves this point of contact it becomes more and more widely separated from the true ellipse. The intermediate radius is obtained by guesswork.

The semi-major axis being $a$, the semi-minor axis being $b$, then the maximum radius of curvature is $\frac{a^2}{b}$, and the minimum radius is $\frac{b^2}{a}$.

*With Gunvald Aus Co., Consulting Engineers, New York City.

Instead of these values, the following may be used:

$$t = \frac{0.04\,b^2 + a^2}{1.04\,b} = \text{Maximum radius.}$$

$$r = \frac{0.04\,a^2 + b^2}{1.04\,a} \quad \text{Minimum radius.}$$

The resulting circle of radius $r$ goes through the points $x = 0.915a$, $y = \pm\, 0.41b$, as well as through the point of tangency $x = a$, $y = 0$. Similarly the circle of radius $t$, goes through $x = 0.41a$, $y = 0.915b$, all these being points on the true ellipse.

Theoretically it is now possible to compute an intermediate radius $s$, such that its arc will be tangent to the two other arcs and also will pass through one point on the ellipse. The computations however are more elaborate than the result warrants. One may obtain the same effect, so far as the eye can detect, by assuming the distance $c = 0.8\,(a - b)$.

The foregoing computations need be only approximate; a variation of two or three per cent will not visibly affect the resulting curve. The position of the point $S$ must be accurately located for it is fixed when the three points $R$, $T$ and $C$ are fixed.

For establishing the position of the point $S$ the following method avoids the use of trigonometry:

$$d^2 + c^2 = e^2; \quad m = \frac{dp}{e}; \quad h = \frac{cp}{e}$$

$$k = t - e - r - h$$

$$g = \frac{n^2}{2k} = \frac{m^2 + k^2}{2k}; \quad f = g - h - k$$

These lengths $f$ and $g$ having been accurately computed, all the necessary co-ordinates are easily found by proportion. The figures may be checked by making a careful layout of the curve, when the circular arcs should exactly meet.

## A "Best Home" Contest

The Cleveland Chapter of the American Institute of Architects will conduct a contest during the American Building Exposition in Cleveland, Ohio, to ascertain the appreciation of good residence architecture by the public.

Home owners have been invited to send in photographs of their residences. These will be enlarged to a standard size and each visitor at the exposition will be invited to cast his ballot for his choice of the three best. A committee of architects also will select three homes according to the standards of architects and the six owners, selected by public vote and the committee, will be awarded bronze medals designed by local art students.

The American Building Exposition will open on April 22 and close on May 2, 1922.

## Oil in House Heating Boilers

MR. CHARLES D. ALLEN, says *Domestic Engineering*, at a recent meeting of the Chicago section of the A. S. H. & V. E. gave the following data relating to the use of oil for house heating boilers.

Crude oils fall under two classifications, those with an asphaltum base and those with a paraffin base. After refining the latter the last product is paraffin, and after refining the former the last product is asphaltum. Oils with a paraffin base are not ordinarily used as fuel as they can be made into products of infinitely greater value, but crude oils that are of a predominating asphaltum base are generally used after the lighter products such as gasoline and kerosene have been removed.

A barrel of fuel oil contains 42 gals., weighs 310 to 336 pounds, occupies about 50 per cent less space than equal heat value of coal, and weighs 35 per cent less.

Generally speaking a gallon of oil weighs 7½ pounds, contains 144,000 B.t.u., and hence in heat value is equal to 12 pounds of coal having a heat value of 12,000 B.t.u.

Theoretically there is not much difference in the air per heat unit required for combustion, but by reason of the nature of gas burners, excess air for proper combustion may be reduced to as low a figure as 10 per cent, while for coal it is never less than 50 per cent, and may be as high as 100 per cent. Largely by reason of this 75 per cent thermal efficiency with oil burners is common, as against only 60 per cent with coal. On this basis 2,000 pounds of coal will give the same actual steaming capacity as 133½ gallons of oil.

Three general types of oil burners have been developed in which steam, air, or mechanical means are used for atomizing the oil. In power plants where high pressure steam is used, the first method is generally employed. In heating plants, with which we are mostly concerned, either mechanical means or compressed air are generally used.

Wm. T. Dean of Chicago, pointed out that the advantages of oil for fuel are its convenience, high heat value, low handling cost, cleanliness, lack of ashes, and limited storage space requirements.

Mr. Eaton of Chicago, stated that 90 per cent of the house-heating boilers sold in California use oil burners. He predicted that oil will eventually displace coal as a fuel and gave as his reasons, in addition to those mentioned by Mr. Dean, the economy in basement space, uniformity in temperature obtainable, and the utilization of boilers that are inefficient when burning coal. He also maintained that boilers burning oil can use smaller flues.

A. B. Frenier discussed oil burners as a new service rather than as an introduction of economy, and dwelt on the great difference in the problems of burning oil in industrial plants as compared with those that had to be overcome in developing oil burners for house-heating boilers. He stated that at the present time it was more a matter of developing boilers that will absorb the heat generated by the oil burners than a case of improving the burners themselves. He agreed with others that boilers with long tortuous flue travel are the best adapted for the burning of oil.

## Construction Costs in Ontario

UNDER date of Feb. 7, Consul G. R. Taggart, London, Ontario, reported to the U. S. Department of Commerce, as follows:

The following tables, showing costs of labor and of building materials in Toronto, were obtained from contractors and from leading Canadian publications dealing with construction work:

*Ontario wages per hour for construction work.*

| Year | Bricklayers | Carpenters | Electricians | Painters | Plumbers | Builders |
|---|---|---|---|---|---|---|
| 1913 .... | $0.62 | $0.43 | $0.42½ | $0.41 | $0.47 | $0.31 |
| 1917 .... | .66 | .49 | .49¾ | .44 | .51½ | .34½ |
| 1920 .... | .92 | .71 | .72 | .66 | .74 | .50 |
| 1921 .... | .89½ | .70 | .71½ | .65¾ | .71½ | .47 |

Values in the above table have been converted to United States currency at the following average rates: December, 1921, $0.929; for the year 1921, $0.895; for 1920, $0.8929; earlier years at par.

New construction in Toronto is held up, pending further deflation in the costs quoted below:

*Comparative wholesale prices of building materials in Ontario.*

| Article | Average, 1914 | Peak, 1920 | December, 1921 |
|---|---|---|---|
| Structural steel ..... 100 pounds.. | $2.50 | $5.80 | $3.02 |
| Cement ....... 300-pound barrel.. | 1.95 | 3.75 | 3.44 |
| Lumber ....... 1,000 board feet.. | 22 00 | 49.11 | 33.44 |
| Bathtubs, enameled iron .... each.. | 15.00 | 38.99 | 34 37 |
| Brick, common .......... 1,000.. | 15.00 | 16.07 | 15.79 |
| Fiber, tarred ...... 25-pound roll.. | .65 | 1.12 | .79 |
| Flooring, oak .. 1,000 board feet.. | 90.00 | 214.30 | 130.06 |
| Glass, window .. 100 feet, 10 x 12.. | 5.20 | 12.44 | 5.11 |
| Lead, white ........ 100 pounds.. | 9.00 | 17.41 | 11.15 |
| Lime, lump .......... long ton.. | 7.84 | 16.50 | 13 53 |
| Nails, wire ..... keg, 100 pounds.. | 3.75 | 6.21 | 4.60 |
| Sand ................. long ton.. | 1 01 | 1.50 | 1.46 |
| Shingles, cedar ........... 1,000.. | 3 50 | 9.82 | 5.81 |
| Stone, broken ......... long ton.. | 1.46 | 2.40 | 2.34 |
| Tile, hollow .... 1,000 square feet.. | 87.50 | 140.63 | 102.19 |

An expenditure of $6,000,000 in the next three years is contemplated toward the erection of a new hotel, public-school buildings, and extension of the plant of Western University.

## Department of Specifications

*(Continued from page 322)*

revolutions. It seems to be the general concensus that if the specification requires that concrete be mixed by machine with the materials revolving in the drum for one minute the resulting concrete will be of an acceptable quality.

The concrete ingredients must be mixed to the desired consistency which should be specified—that is, for reinforced work it must be sufficiently plastic so that it will flow around the reinforcing and fill the interstices. At times, such as for plain concrete floors that are to be placed on earth, and finished with a finished topping, the concrete should be of a fairly stiff and dry mix as the water in the topping that is to be applied later will permeate the dry concrete and make a much better floor than if it had been mixed quite wet. The consistency of the concrete must be varied to suit the various condition on the work and the specifications not only should give some power of control over consistency to the superintendent, but also should allow the contractor some latitude as to choice. In all cases, however, concrete that is "soupy" should not be used unless it is to be used as grout or for any one of a number of places where an extremely fine mix for surface finish or for penetration into small spaces is necessary.

If concrete is to be chuted in place the consistency of it must be such that it will travel along without the constituent ingredients becoming separated. If hydrated lime has been mixed into the concrete the chuting will be accomplished somewhat more easily than otherwise.

In caisson work or sub-aqueous work the consistency of the concrete must be given especial attention so that the conditions that will be present are fully explained by the specific requirements in the specifications. Specific instances will occur where a consistency of concrete that would be acceptable in most cases would be totally unacceptable in one or a few and the specification writer must exercise his judgment in these particular instances to make sure that the specifications recognize the possibility of these particular requirements coming up for attention. Otherwise, he might find himself involved in embarrassing moments with a contractor and may be accused of being quite specific on common matters but totally ignorant on more important matters that really deserve a more concise specification than usually is the case.

Re-tempering of concrete after initial set has taken place should never be permitted, regardless of any theories to the contrary that may be propagated by anyone advocating the use of compounds to be mixed integrally with the concrete. It may seem ridiculous to include a sentence covering rejection of partially set concrete or to require that concrete must be deposited in final position within five minutes or so after being mixed but there may come one time in a hundred when such a saving clause will be of great benefit in controversies.


OLD ROUND TOWER, ENKHUISEN, HOLLAND

(FROM THE ORIGINAL WATER COLOR BY CASS GILBERT)

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW
VOL. CXXI WEDNESDAY, APRIL 26, 1922 NUMBER 2392

Independence Hall, Philadelphia
Built 1731-1736. The arcades and small wing buildings are restorations, and not authentic. To the extreme right is Congress Hall

# EARLY AMERICAN BRICK MAKING*

BY CARL A. ZIEGLER, A. I. A.

Illustrated by photographs by Ph. B. Wallace

IT is certainly most appropriate that the Brick Manufacturers' Association of Eastern Pennsylvania, Southern New Jersey and Delaware should meet in Philadelphia as there is no other city in the country that was so largely influenced by the use of brick construction in the Colonial days and no other city can exhibit so many excellent early examples of this type of architecture.

The late Dr. S. Wier Mitchell wrote his splendid book on "The Red City" with this in mind and Philadelphia was familiarly known as the brick city in the early days when it was the metropolis of the Colonies.

Unfortunately few Americans realize what a heritage they have in the old brick buildings of this country.

If you have ever made a pilgrimage in search of old Colonial brick buildings you have probably observed that the first fact the "oldest inhabitant" attempts to impress you with is that the "bricks were all brought from England."

Most of these imported bricks belong in the same category as the furniture which is reputed to have come over in the Mayflower; some came, of course, but it is appalling to think of what a fleet would have been necessary to bring over all that

*An address delivered before Philadelphia Construction Conference Group and Brick Manufacturers' Association.*

is said to have been imported, to say nothing of the expense. Ships were few and small and the demand for the very necessities of life was great. It is incredible, therefore, that any great quantity of brick could have been imported in those early days.

To test these oft-reiterated statements I have searched the early records and thought you might be interested to know just when bricks were first made in this country. The search has brought out many interesting facts and if our forefathers imported bricks from Europe up to the time of the Revolutionary War and after, as has been said, they were not the thrifty business men that we are accustomed to consider them.

The first brick kiln in New England was erected in Salem, Mass., in 1629. The minister at Salem during July of that year wrote "It is thought here is good clay to make Bricke and Tyles. At this instant we are setting up a brick kill to make bricke for the building of our houses."

Gawan Laurie of East New Jersey writes in 1684 "The poorer classes of houses are quite primitive in style, trees were split and set up with one end in the ground and the other nailed to the 'Rising.' They were covered with shingles and plastered within. Barns were built in the same way and the cost of these was about £5. Some used Pantiles in the Dutch manner. We have good brick earth and stone for building at Amboy and elsewhere. The country farm houses they build very cheaply, a carpenter with the Owner's own servants build the houses, they have all the material for nothing, save the nails."

"Gloria Dei"
Old Swedes Church, Philadelphia, Pa., Built 1698

The first dwellings erected by the Swedes in Pennsylvania and Delaware were very crude and chiefly of wood, one story in height with a single room with a low entrance door and crude windows that were merely openings in the walls, later to be covered with oiled paper in lieu of glass. They were of the type common in Northern Europe for a century or two previous. On Timicum Island and Christiana Creek they built strong rude forts of hemlock and hickory logs. They built a brick house at Wicaco in 1700 which still stands. Better dwellings were erected by their successors and neighbors, the Dutch, who brought bricks from New Netherlands for the purpose. At New Amstel (New Castle), Delaware, bricks were made in 1656. (Wm. Penn landed in New Castle, October 27th, 1682.)

Although the first English settlers in Pennsylvania were compelled to find lodging under the friendly trees and in caves or huts (John Key, the first child born of English parents in Philadelphia having been born in a cave in the bank near Race Street) they were shortly in possession of substantial brick houses. One writer states "Far out Market Street at Center Square embosomed in the Forest was erected in 1684 the First Friends' Meeting House, a large plain brick building." The present City Hall now stands on this site at the intersection of Broad and Market Streets.

William Penn's instruction to his agent in 1684 was to build principally of bricks "for

St. Peter's Church, Philadelphia, Built 1758-1761

Detail of brickwork, Christ Church, Philadelphia

This church which was the most important church building in Philadelphia in the Colonial days is a splendid specimen of Colonial architecture and quite equal to any edifice that has been erected in Philadelphia up to the present day. Like all the important churches within the city this structure is substantially built of brick in the old manner that creates such a distinctive atmosphere of refinement and restraint. There has been much debate among antiquaries as to whether the brick was imported from England or not. There are records in the archives of the Parish showing that bricks were delivered by "sailing vessel" to Philadelphia for the structure erected in 1685, but whether the vessel came from England or from another of the Colonies, or possibly from New Castle on the Delaware only a few miles below Philadelphia where brick was made in 1656, is not stated. The 1727 structure was erected under the direction of Dr. John Kearsley and although no plans are now in existence, drawings were no doubt prepared by him. In 1746 a competition seemed to have been held in order to secure a design for the spire, (possibly the first architectural competition in America), in

which end I have sent a person qualified to make them."

Clay, sand and gravel were abundant within the city and fuel abounded on the banks of the Delaware and Schuylkill Rivers.

It is probable that some of the early houses, of which Philadelphia contained in 1684 over three hundred, were built of imported bricks, but Pastorius who founded Germantown in 1685 records that "they had a sufficient number of mills, brick-kilns, and tile ovens for all purposes." Four-fifths of the buildings in Philadelphia at the close of the Eighteenth Century were of brick and the city had at that early date a high reputation for the manufacturing of brick.

Christ Church on Second Street, south of Market Street, was built in 1727, but there was a church upon this site as early as 1695.

any event the Vestry decided in June 1746 that "in erecting the spire the draft which Mr. Harrison drew should be followed."

St. Peter's Church on Pine Street between Third and Fourth Streets was started in 1758. Dr. John Kearsley (the same who had in charge the building of Christ Church) and six others drew up a plan that was approved by the Vestry and the work was dedicated in 1761. Old St. Peter's with its grounds covering almost an entire city square, enclosed by a brick wall whose gateways have become a tradition in the architectural profession, stands as a monument to those sturdy straight thinking men to whose efforts we owe the "Red City" of Pennsylvania.

Gloria Dei commonly known as Old Swedes Church at Water and Christian Streets was erected in 1698. The selection of the site was long delayed by a disagreement. One faction wanted it built at Passayunk (now Point Breeze) while others wanted it erected at Wicaco, about half a mile below what was then the southern boundary of the city. Finally at a congregational meeting on May 17, 1698, the matter was settled by writing the names of both places on separate pieces of paper and placing them in a hat. After tossing them around they were thrown upon the floor and the one bearing the word Wicaco landing face upward, the matter was settled.

This is the earliest brick church in Philadelphia and was built to replace the old block house built upon the site in 1665 in which the Swedes were accustomed to worship. Although smaller than Christ Church or St. Peter's it is a fine old example of Colonial architecture and quite Pre Georgian in its style.

The most important early brick structure in Philadelphia is Independence Hall well named the "Cradle of Liberty." The events which occurred within its walls have stirred the imagination of the world. The large central building of this group was designed by Andrew Hamilton, a lawyer; the land was purchased in 1730 and Andrew Hamilton, Dr. John Kearsley and Thomas Lawrence were appointed to supervise the construction of the building. Many delays occurred and in October 1736 when the Legislature sat in the east room on the first floor the windows were still unglazed. The tower was built in 1750, but the steeple was not erected until 1753.

Independence Hall has unfortunately undergone many changes and has been used for a variety of purposes. For a time it was rented to Charles Wilson Peale, the artist, and used by him as a museum. Later it was used by the City Councils.

The building was sadly neglected for many years and unfortunately when it was restored the Chamber in which the Declaration of Independence was signed was not restored to its original condition. The first floor of the building and the stair hall are pleasing in design, but it is nevertheless to be regretted that we are not able to visualize the interior of this historic building as it existed in 1776.

The westernmost building of the Independence Hall group known as "Congress Hall" was originally intended as the County Building. It was completed in 1789 and Congress first sat in it on December 6, 1790, when the National Capitol was removed from New York to Philadelphia. Congress occupied this building until May, 1800, when they moved to Washington, D. C. The building was restored by a Committee appointed by the Philadelphia Chapter A. I. A. in 1913 and has since been used as a permanent museum for the

Detail of lower portion of tower of Independence Hall, Philadelphia exhibition of antiquities of the Colonial Period.

The old Jail was located at Sixth and Walnut Streets, just in back of Congress Hall and convict labor was used in constructing the latter building. From the quaintly worded records we learn that human nature has not changed much since the early days, for the convict laborers were in the habit of lifting the iron ball and chain by which they were shackled and dropping same into the mud on the passing of some of the silk-stockinged gentry out on promenade, which fact seriously disturbed the city fathers and brought many threats of suit for damages.

Congress Hall, Philadelphia, Built in 1789. Congress sat in this building from 1790 to 1800. George Washington was here inaugurated for his second term

At the eastern end of the group is the First City Hall, possessed by Philadelphia; it was built in 1790. Although originally intended for city offices, it was necessary to tender a portion of it to the United States Supreme Court, when the Federal Government was moved to Philadelphia in 1790. The Supreme Court held its first session in the building on February 7, 1791. The Supreme Court of the State of Pennsylvania also sat in the building and subsequently it was occupied by the City Councils.

When we read in the early history of the Colonies that smoking was prohibited within the city limits in certain provinces and travellers were prohibited from smoking but once in a ten mile journey in others, we are inclined to attribute puritanic instincts to our staid and sober forebears but certainly they did not taboo the lottery, for the records show that a lottery was instituted to further the erection of this "Towne Hall" in Philadelphia with $50,000.00 as the aggregate, 20 per cent. of which was to go to the fortunate winner.

At the rear of this interesting group was the "State House Yard" or the "Mall" as it was sometimes called. This contained a serpentine walk and it was the custom of the élite to promenade thereon upon pleasant afternoons as a mode of recreation. The "Mall" was surrounded by a brick wall with piers at regular intervals, the entire height of which was about 8 feet. The city fathers became apprehensive that the air in the "State House Yard" was not conducive to the public health and after deep deliberation it was deemed desirable to remove the brick wall between the piers and to replace the same with "iron palisades in order that the atmosphere might be made the more salubrious." It is to be hoped that the treatment was efficacious.

Steadfast and true to every belief that they held, these sturdy pioneers of the young Republic have left us monuments of government and of art which we of a more hectic generation may well strive with like singleness of purpose to emulate.

Up until 1829 all the bricks used in this country were made by hand, but during that year the manufacturing of brick by machinery was successfully started. In New York the machinery then used made twenty-five thousand bricks per day and

Christ Church, Philadelphia, Built 1727. Over the Palladian window on the front, there still remains the bust of George III they were sold for Five Dollars ($5.00) a thousand. The Salamanda Fire Brick Works at Albany, New York, was established that year and was so successful as to stop the importation of fire bricks.

So closely is the making of brick interwoven with the march of human progress that one must go back to the dawn of history to learn of the beginning of the industry. The earliest evidences we have of recorded history are a few manuscripts and inscriptions found in Egypt, dating back about three or four thousand years B. C. Those of Babylonia are scarcely less ancient. Both of these countries owe their prosperity to great rivers which inundated the land enriching it for agricultural pursuits and furnishing also great deposits of clay from which the natives built houses, first of adobe and then of brick. Israel labored long in Egypt as brick makers as Scripture records. Babylonia, situated as it was between the Tigris and the Euphrates Rivers in the valley called Mesopotamia (The land between the rivers) possessed no forests although the date palm was abundant and with little stone, they early resorted to the expedient of moulding the clay into bricks, which were dried in the sun and from these they built their cities.

Of all the early Babylonian kings the most famous was Hammurabi, who ruled about 2000 B. C. He it was who formulated the oldest code of laws of which we have any record, but long before man achieved a legal code he made bricks and from the characters imprinted upon these bricks, marking the dynasty under which they were made, many important dates in history have been verified.

Noble indeed has been the art of brick making and human progress owes much to this industry.

East End, St. Peter's Church, Philadelphia


The Bridge Approach to the Forecourt

# EAST HIGH SCHOOL, CINCINNATI, OHIO

GARBER & WOODWARD, Architects

*THE following communication, received from Messrs. Garber & Woodward, Architects, and printed by their permission, valuably supplements the illustration of this interesting high school group.*
EDITORS.

THE educational problem to be solved in this school was not a light one and is of primary importance as the program is to any competition. We had in this problem, however, not only a definite object to accomplish but the hearty co-operation of the Superintendent and a small Board that were eager to get all they could out of the solution of the problem.

A word as to the site: The site selected by the Board of Education consists of 38 acres, an old farm, located on the edge of one of our best residence districts. It also draws from a remoter district children from a factory colony. These conditions called for a school to house all the activities that could be required in a high school. As Dr. Condon, the Superintendent, expressed it in words that are now carved on the base of the tower:

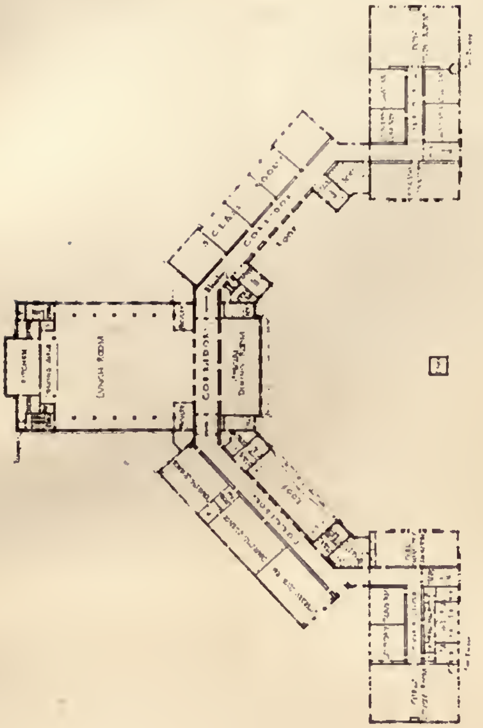
"All who will may enter and find within these walls equal and varied opportunity for a liberal education, based alike upon art and industry, with books and things, work and study combined; and where good health, the spirit of play, and joy in work well done shall abound."

Some of the restrictions were of great importance. First, the lot faced a very important thoroughfare. Second, the axis of another equally important thoroughfare terminated in whatever would become the forecourt of a group of buildings or the principal feature of the exterior of the building. Third, the extreme variation in the grades of the lot was 60 feet.

The lot seemed impossible, except at great expense, to house all departments in one building. The fine wooded valley running parallel with the street we considered should be preserved. We were of the opinion that with the lot restrictions, it would be best not to house all the departments in one building but to arrange them in a group of buildings. All preceding high schools in Cincinnati were housed under one roof.

The chief objection to a group plan was the time that would be lost in moving classes between periods. This objection was answered, as it was believed, and has since proved a fact, that a few minutes so lost would be more than made up by the efficiency of the pupils in the class room; the advantages of outlook and the fenestration also were not to be ignored. The orientation is such that the sun is present some time each day in each room.

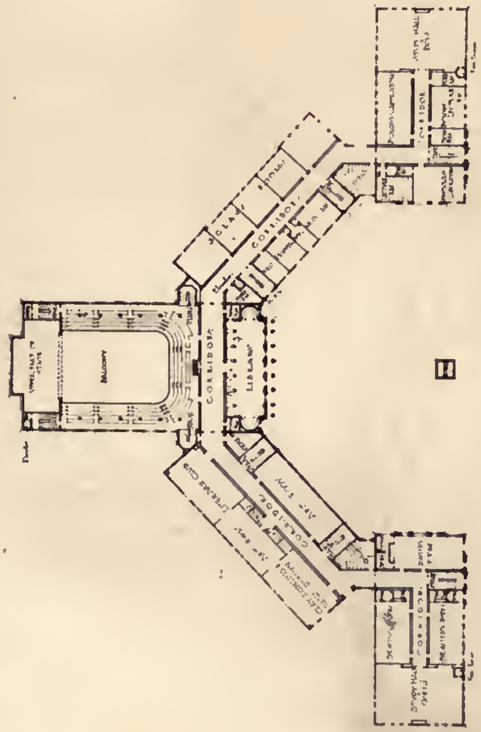
The departments at this time were located and the development of the plan began. The departments as located were as follows: The central



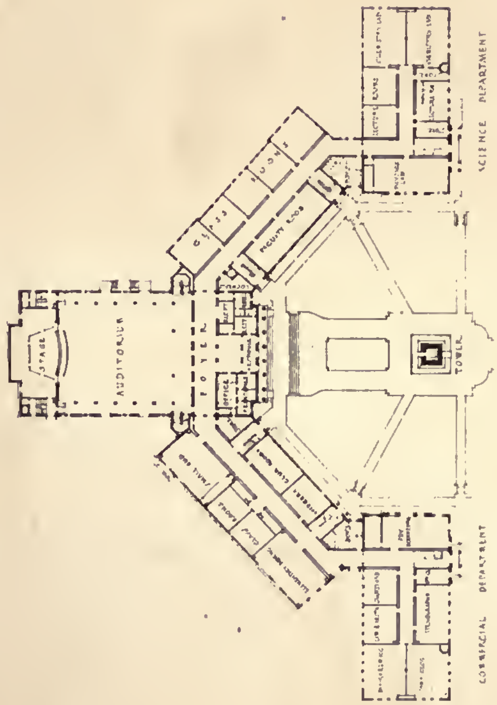

THIRD FLOOR PLAN

ACADEMIC GROUP
EAST HIGH SCHOOL, CINCINNATI, O.

GARBER & WOODWARD, ARCHITECTS

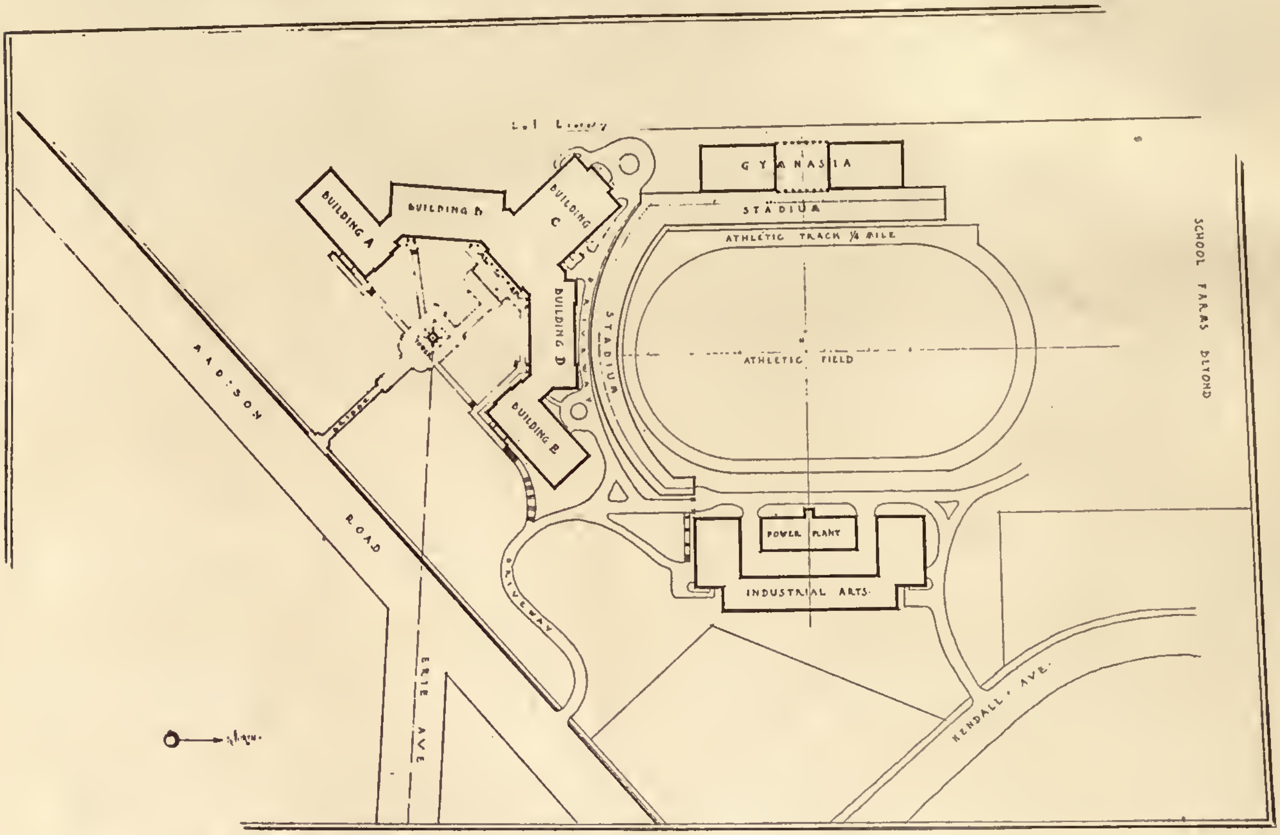



SECOND FLOOR PLAN




FIRST FLOOR PLAN

building houses on the first floor the administrative office and auditorium. The second floor, the balcony of the auditorium and the library. On the third floor the lunch rooms. Grouped about this center, beginning with building "A," extreme left, the commercial department is housed on the first floor with one of its rooms in building "B" in the rear. Continuing along the rear there are two class rooms and a small auditorium. The rooms facing the forecourt are literary club rooms which are used for club purposes, teachers' meetings, etc., and for recitations in literature. The building "C." Building "D" is devoted entirely to class rooms, faculty rooms and emergency room. The class rooms were not all located in building "D" but some were located in each building except building "C." This permitted of a little more elasticity and reduced the moving of classes from building to building. They were also placed in this building because of their central location and particularly for their proximity to the industrial arts building and the gymnasia. Building "E" is devoted entirely to the sciences and their lecture rooms and several class rooms, and on the



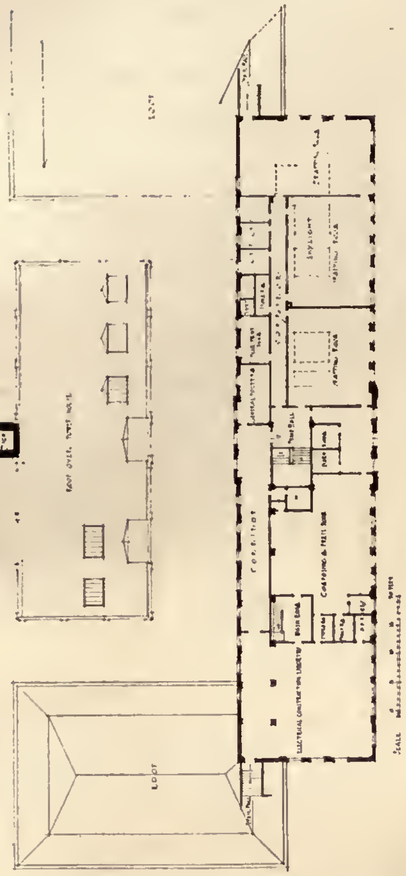

GROUP PLAN
EAST HIGH SCHOOL, CINCINNATI, O.
GARBER & WOODWARD, ARCHITECTS

second floor of building "A" is occupied by a large study hall and sewing rooms. On the second floor of building "B" are housed the arts and crafts with a large class room. It will be seen that the art rooms are on the same floor and adjacent to the library in building "C." The third floor of building "A" is occupied by a model flat, girls' study room, class room and laundry and a girls' chemistry laboratory and on the same level in building "B" domestic science rooms. The girls' chemistry laboratory, which is devoted to the chemistry of cooking, is adjacent to the domestic science rooms located on this same floor in building "B" and the lunch room on the same floor in upper two floors in a corresponding position, as in building "A" are the boys' study rooms.

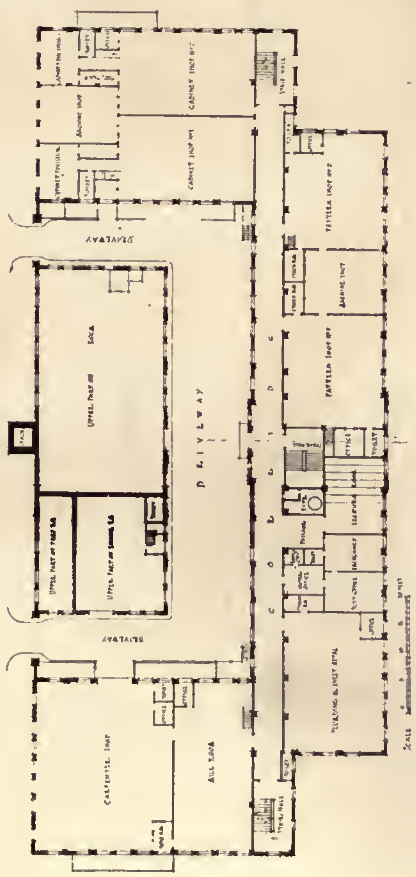
In the program for the gymnasia and the stadium, which might be considered as a part of it, all physical activities of the school are housed and provisions are made for visiting teams and for all the activities of the stadium. This is the only stadium in the city available for all the high schools. On the first floor, which rises above the concourse level to the left, are located the plunge, shower and dressing rooms and immediately above it the gymnasium for the girls. To the right, the same provisions are made for the boys. As the land slopes toward this end of the building, pro-

## INDUSTRIAL ARTS BUILDING AND POWER PLANT
## EAST HIGH SCHOOL, CINCINNATI, O.

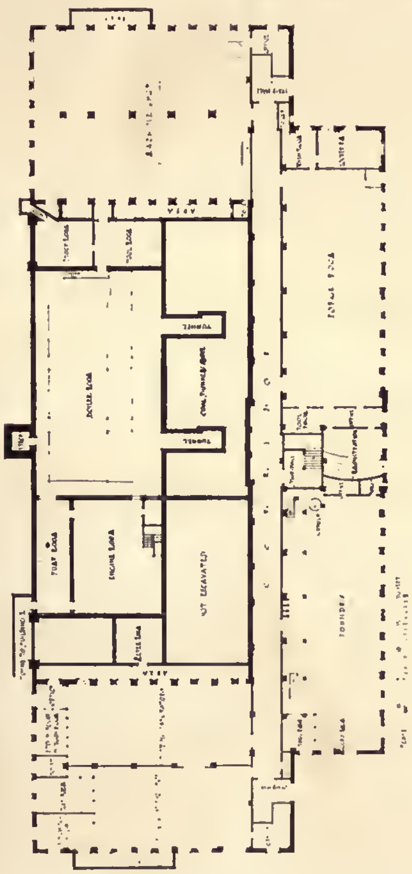
GARBER & WOODWARD, ARCHITECTS



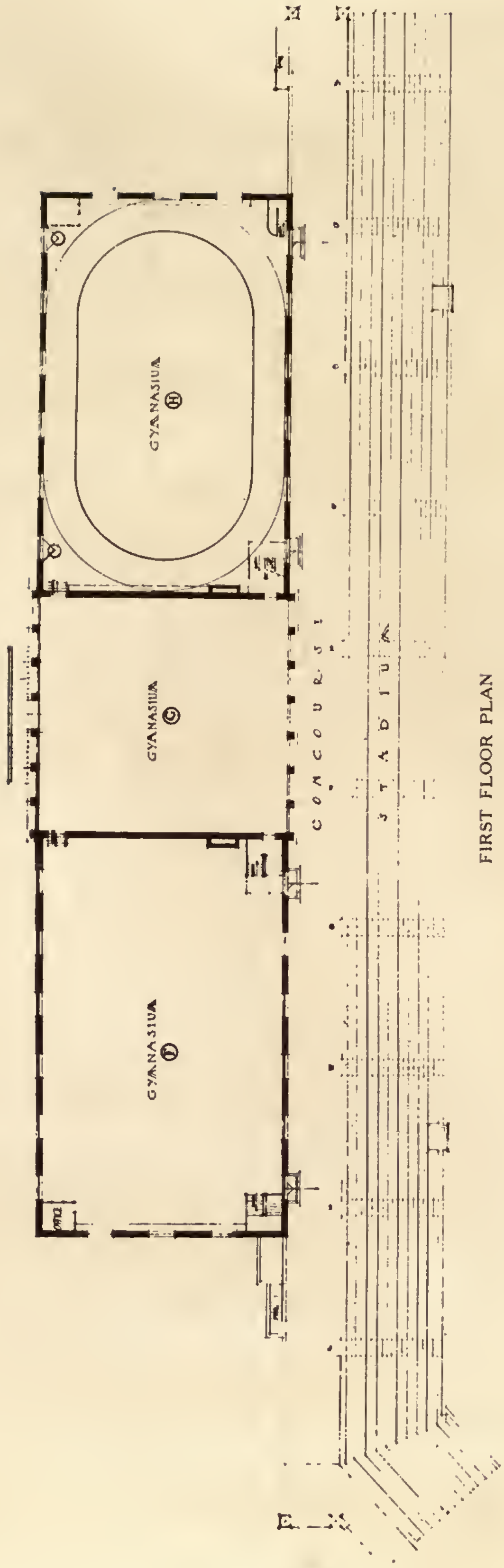
THIRD FLOOR PLAN



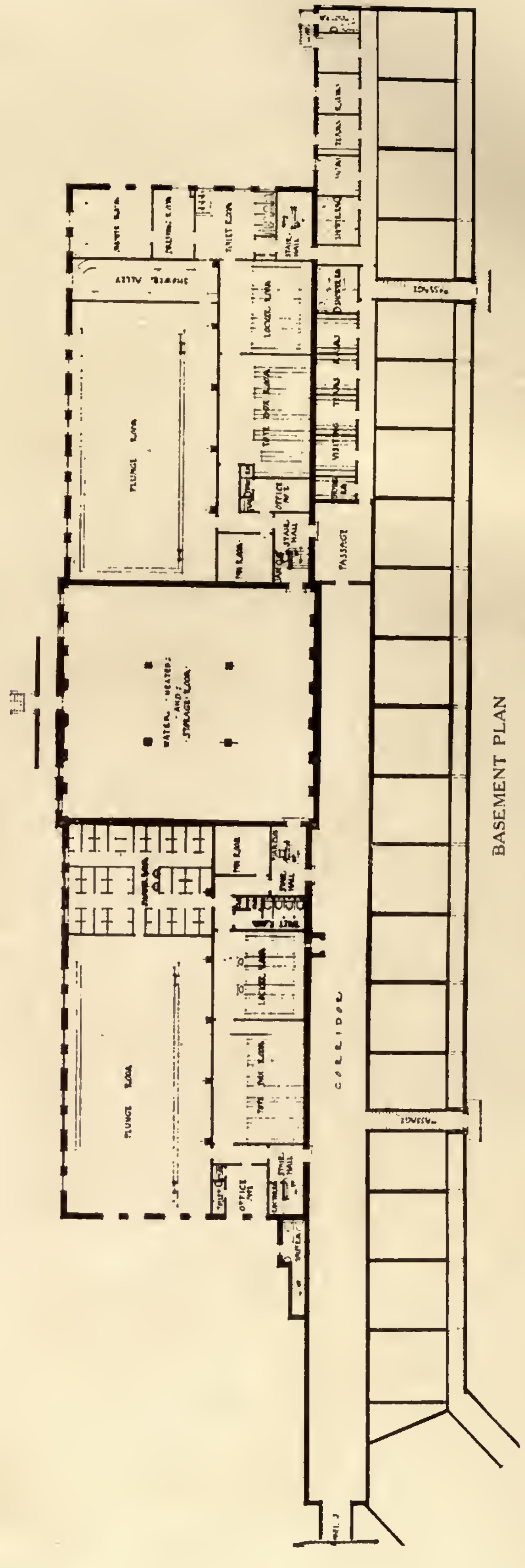
SECOND FLOOR PLAN



FIRST FLOOR PLAN




FIRST FLOOR PLAN




BASEMENT PLAN

GYMNASIUM AND STADIUM
EAST HIGH SCHOOL, CINCINNATI, O.
GARBER & WOODWARD, ARCHITECTS

visions were made for a laundry where in time it is hoped to have the necessary machinery installed. Between these two gymnasia is located the open air gymnasium. The open air gymnasium can be used by either boys or girls and the walls are prepared for hand ball and basket ball. This gymnasium is used only when the weather will not permit the use of the field for gymnastic exercises. By the use of team rooms, visiting pupils are excluded from all the gymnasia.

In the industrial arts, all departments of industrial work were to be housed. Grouped with the industrial arts buildings are the heating facilities for the entire group of buildings. This building although externally conforming to the design of the buildings for the gymnasia and the academic group is on the interior, finished as a factory. The building is extremely compact and the corridor space, which runs the full length of the building, is divided into two stores for each shop height to provide the necessary locker space. In this building are housed on the first floor automobile construction shop, testing laboratory, foundry, forge and machine shops; second floor, carpenter shop, mill room, plumbing and sheet metal, pattern and cabinet shops; on the third floor, electric construction laboratory, composing press room and drafting rooms.

A word as to special features: In laying out the preliminary sketches, the architects found that the number of pupils per class varied with each department. In the interest of economy in construction and teaching, insofar as possible, a unit of thirty pupils was fixed for all classes. This is an innovation and each class accommodates thirty or multiples of thirty. In other words, the gymnasia classes were fixed at sixty, two units, with provision for ninety if needed. The science, commercial, industrial and household arts were fixed at one unit or a multiple thereof. A small auditorium was provided to take five units. This is used for special group instruction for science classes, music, special lectures in which lantern slides and moving pictures are used. The study rooms, four in number, were fixed at eight units each. The total capacity of the school was figured at 1,800. This provides for one-half the pupils on this basis to make their home rooms, as they may be called for want of a better name, in the study rooms. With thirty class rooms the total number of pupils is made up. Each pupil is provided with a locker in the corridors, which distributes the pupils over the entire building. The lockers take up all the space between double walls not used by columns, heat ducts, and other utilities. What the total capacity of the school would be if all departments were working to their full quota of thirty, we are not prepared to say as that would be a matter of program. But this we do know, that this year there are 400 more pupils than the school was designed for and as yet no interference with the functioning of the school has been noted.

In lieu of home rooms for the teachers, there is a faculty room. In this room provisions are made so that a number of instructors can use it as their headquarters when not teaching. This applies primarily to the teachers who do class room work only. The departments in science and the commercial arts have provisions made for offices for their instructors' use and there is no difficulty in the arts department of having the teachers use their rooms as home rooms. There is no reason, however, why the class rooms should not be used every hour of the day and they will be when the school becomes crowded. It is false economy to permit a room to be used for instructions for two periods a day, say in Latin, and used for no other purpose during the remainder of the day. Such a teacher would be assigned to a class as a pupil and her remaining time, if not utilized in class work, would be employed in the faculty room. The use of the faculty room and the provision made for doubling up certain units have added an elasticity which we have not found in our other high schools.

The auditorium is a part of the academic group and has a seating capacity equal to the capacity of the school, with ample stage facilities. Through the generosity of Mr. R. K. LeBlond, a citizen of the community served by this school, a large Skinner pipe organ was installed behind a neatly designed screen at the rear of the stage, the manual of which was placed on the main floor near the orchestra pit.

As to the exterior: The buildings are approached from either end through the valley and on the main axis by the bridge. The bridge became necessary as we retained the beautiful wooded valley between the street and buildings. The drive follows the rear of the academic group. The forecourt is approached across the bridge on the axis of the tower. The tower not only marks the axis on Madison Road, which it faces, but also terminates the end of Erie Avenue and can be seen for at least a mile and a quarter.

The cupolas on the buildings and the chimneys are for discharging foul air.

The gymnasia and the industrial arts face the long side of the athletic field and are at right angles to the axis of building "D."

Beyond the athletic field when the demand is created and funds are available, the Board expects to develop an agricultural school.

The buildings are all fireproof cage construction of concrete. There are no particular structural features of note.

FRANCIS ASBURY

AN HEROIC STATUE TO BE ERECTED IN WASHINGTON, D. C.

AUGUSTUS LUKEMAN, SCULPTOR

GENERAL DAVID McMURTRIE GREGG

HEROIC STATUE ERECTED IN READING, PA.

AUGUSTUS LUKEMAN, SCULPTOR

EAST HIGH SCHOOL, CINCINNATI, O., GARBER & WOODWARD, ARCHITECTS

*(For complete description and floor plans see poges 340 to 345, both inclusive)*

346'

VIEW OF TOWER AND RIGHT FORECOURT, BUILDINGS D AND F

346

ELEVATION BUILDING B, ACADEMIC GROUP. MAIN ENTRANCE AT RIGHT

EAST HIGH SCHOOL, CINCINNATI, O.

GARBER & WOODWARD, ARCHITECTS

546³

C.

DETAIL OF BUILDING D

EAST HIGH SCHOOL, CINCINNATI, O.

GARBER & WOODWARD, ARCHITECTS

3464

POWER PLANT AND INDUSTRIAL BUILDING, FROM ATHLETIC FIELD

BUILDING E, FROM FORECOURT

EAST HIGH SCHOOL, CINCINNATI, O.

GARBER & WOODWARD, ARCHITECTS

346 5

ELEVATION OF BUILDING D

REAR VIEW, ACADEMIC GROUP, FROM ATHLETIC FIELD

EAST HIGH SCHOOL, CINCINNATI, O.

GARBER & WOODWARD, ARCHITECTS

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AUDITORIUM

EAST HIGH SCHOOL, CINCINNATI, O.

GYMNASIUM, FROM ATHLETIC FIELD

EAST HIGH SCHOOL, CINCINNATI, O.

GARBER & WOODWARD, ARCHITECTS

346 10

BUILDING FOR HUMBLE OIL & REFINING CO., HOUSTON, TEXAS
CLINTON & RUSSELL, ARCHITECTS

346"


DETAIL OF MAIN ENTRANCE

BUILDING FOR HUMBLE OIL & REFINING CO., HOUSTON, TEXAS

CLINTON & RUSSELL, ARCHITECTS

346 12

THE BOARD ROOM

BUILDING FOR HUMBLE OIL & REFINING CO., HOUSTON, TEXAS

CLINTON & RUSSELL, ARCHITECTS

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DETAILS OF UPPER AND LOWER STORIES, POLK AVENUE ELEVATION

BUILDING FOR HUMBLE OIL & REFINING CO., HOUSTON, TEXAS

CLINTON & RUSSELL, ARCHITECTS

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STORE FRONTS ON MAIN STREET

REAR ELEVATION

BUILDING FOR HUMBLE OIL & REFINING CO., HOUSTON, TEXAS

CLINTON & RUSSELL, ARCHITECTS

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ABOVE: TYPICAL CORRIDOR. AT LEFT: DETAIL OF MANTEL IN BOARD ROOM

BUILDING FOR HUMBLE OIL & REFINING CO., HOUSTON, TEXAS

CLINTON & RUSSELL, ARCHITECTS

346/16

# ·EDITORIAL·COMMENT·

OF THE EIGHT HOUSING bills, presented by the Lockwood Committee and passed by the New York State Legislature, Governor Miller has signed seven. Of these, the one as more largely affecting housing conditions in New York State is that which enables insurance companies to invest up to ten per cent. of their assets in apartment houses where the monthly rental shall not exceed nine dollars per room. One of the largest insurance companies has already promised to set apart $100,000,000 to this purpose. This bill is but a temporary measure and can only be justified as such. It was framed and its passage urged as affording the only practical means of relieving a shortage in certain types of dwellings, which has become acute. The duration of the powers granted is limited to March 1, 1924, unless the Legislature shall further extend the emergency laws. With the passage of this law and the quick action promised by the insurance company, it is believed the crisis in housing will soon have passed its worst stage.

The present successful legislation is the culmination of two years' arduous work on the part of the Lockwood Committee. A condition that seriously affected the economic welfare of this state existed. The Lockwood Committee has, as the result of its long labors, secured the passage of a group of enactments, that, while not a panacea for all our building and housing ills, are a long step in the direction of the abatement of conditions that had become intolerable.

The bills signed by Governor Miller, in addition to the one already referred to, provide:

That the emergency rent laws shall be in force to March 1, 1924, unless further extended by the Legislature.
That tenants shall be further protected by new sections of the law from the rapacity of gouging landlords.
That fire insurance rate making monopolies shall cease and that all rate making bodies shall be subject to the supervision of Superintendent of Insurance.
That mutual fire insurance companies shall not convert themselves into stock companies.
That mutual insurance companies may write the same line of policies as stock companies.
That New York City may hold principal contractors to perform work abandoned by sub-contractors.

The present outlook in New York State is now encouraging. Capital having signified a willingness to do its part to the fullest extent, all that remains is for labor and all and sundry who engage in building operations, to show an equally liberal spirit of co-operation.

* * *

REFERRING IN A RECENT issue to the work of The Architectural League of New York, in the development of a higher grade of craftsmanship in this country, as shown in the exhibitions of that efficiently working organization, the necessity for similar well sustained effort all over the United States was emphasized.

Just now when there is strong indication that we are entering on the most important building era this country has ever experienced, the shortage of skilled labor is everywhere apparent.

Organized architecture may indulge in no more useful work than in the effort to overcome these conditions, and by well directed measures secure co-operation on the part of organized labor that will result in a better educated and more technically skillful type of craftsman. Until this is done architects will be sadly hampered in securing a satisfactory completion of even the simplest design. Now they hesitate to give full swing to their artistic faculties in design, despairing of their proper execution.

Several years ago, a report was presented to the Institute at one of its conventions, on the development of craftsmanship. Ralph Adams Cram was the chairman of the committee, and in the course of the reading of this report, Mr. Cram stated that the craftsman was "the architect's *alter ego.*"

This very true acknowledgment of the proper relationship of craftsmanship and architecture left with us an impression that the years have not effaced. Like many another of the splendid reports of various committees, it received its polite ripple of applause, the stamp of approval, and there it apparently ended. There are hundreds of matters that have consumed the time of conventions since then of far less real importance than this matter of craftsmanship.

As our building activities increase and the scarcity of skilled labor becomes more apparent, the need for some systematic control of the methods of recruiting the ranks of our craftsmen will become insistent.

Why not omit many of the useless, time-wasting debates; why not omit politics and personal preferment and take up a small group of practical, vital things and give them the strongest support? Craftsmanship and its best development are the crying needs in the development of good architectural design; it is the vital thing in good building. No one can successfully dispute it. It is a fact. The most thoughtful men in the profession have at one time or another substantially made such a statement.

The Architectural League of New York has for a number of years given much of the time of its well organized committees to efforts to develop good craftsmanship. In its various exhibitions, it has been able to show in the finest way the splendid results it has accomplished in the sphere of its influence. But this fine example needs to be followed by organizations in every state. And that would be a great effort for State Societies. In fact, the more that these and other equally important and much needed reforms are considered, the more logical it seems to be to contend that what is needed is more State Societies.

Detroit, as pointed out in a recent issue, is following the excellent example set by Philadelphia, and holding classes, looking to the higher education of all the many craftsmen engaged in building operations. Apparently the machinery of the Institute is too cumbersome, or too overloaded with matters more nearly allied to the theory of practice to be able to give this important matter the attention it deserves.

* * *

ANOTHER MATTER THAT might be efficiently furthered by activities of State Societies is that of Basic Building Codes. The insistencies of codes and also their inconsistencies have in one way or another a harmful effect on building resumption.

Some three years ago, a Committee on Basic Building Codes of the Institute practically threw up the sponge and acknowledged itself at a loss to suggest any practical manner for proceeding to a standardization of building requirements as relating to codes.

Mr. Hoover's Department in Washington has through specially appointed committees been trying to get this matter of a basic code on the road to solution. Progress is reported but results are not yet practically in sight. We are too large a country and the matter of codes is too cumbersome a problem to hope for much progress, particularly if progress is to mean a solution that will apply to the entire country. But, if there were well organized State Societies in every state, working in co-operation with local state organizations, such, for example, as The Architectural League of New York, there would come order out of the present chaos, and we might be able to detect a measure of progress.

* * *

"HELL," IT IS SAID, "is paved with good intentions." It must be acknowledged that the intentions of the Institute, as set forth in its various committee reports are always good. What is lacking is a measure of performance. Nor is this lack of performance entirely the fault of the Institute as at present organized, but it is mainly due to its failure to carry its organization to the same executive completion that other organizations, representing less important industries, are conducted.

What any body, seeking to represent an industry as large and important as architecture, requires is an executive head and well developed working force to take up the matters brought before conventions and approved, and carry them to the utmost possible conclusion. When such an executive department is organized, much of the present criticism of the Institute will cease. With an efficient executive head, The American Institute of Architects would be as constantly in the public eye as is now any one of the well organized representative bodies of other professions and industries.

Then, the calumnies on the profession that are ignored, the influence of the Institute in every public problem that might rightfully concern it, would be treated in the proper way.

Then would architects resume their proper position as the master builders. Then would the general public learn that architecture was something more than the production of drawings of design and plan. It would be known that architects, while first of all artists, must also be efficient and thoroughly practical executives.

* * *

ARCHITECTS WHO WOULD keep abreast with present conditions as to adequacy of wiring, should learn just what those conditions are, impress them on their clients and urge the importance of adequate wiring. Not so many years ago, the lighting load alone was considered and many present wiring codes are based on old practice.

As an instance of new conditions arising from the introduction by tenants of many electrical accessories, a recent survey of a modern apartment house is a case in point. Of the larger utilities, such as portable vacuum cleaners, electrical stoves and flat irons, there was a total of 157, and in addition to this, each family had installed the many different varieties of dining table and toilet electrical appliances.

In the bill rendered for electrical current, the appliance load was 37.2 per cent., the power load 34.4 per cent. and the lighting load only 28.4 per cent. of the total. As will be seen, the lighting load was but a small fraction in excess of one-quarter of the total, while the appliance load was almost two-fifths of the entire load.

# TWO COLUMNS FROM LA DAURADE*

SOME columns and a handful of mosaic cubes are all that remain of the ancient church of Notre-Dame La Daurade at Toulouse, one of the earliest Christian churches in Gaul and certainly the most magnificent church north of the Alps before the time of Charlemagne.

This venerable monument was destroyed in 1764 to make way for the present structure, built from the designs of the architect Hardy, which stands on the site of the old church. Fortunately, however, we have a description of the splendid mosaics which were the chief glory of the church, in a manuscript written by Dom Lamothe† in 1633, before the destruction of the primitive edifice. Another Benedictine, Dom Martin, in his work on the religion of the Gauls, published in 1727, devotes a chapter to Notre-Dame La Daurade and gives a wretched engraving showing a ground plan of the church as it was in his day, a conjectural plan of the original church, and a sectional view of the interior of the sanctuary. Although, unhappily, there are discrepancies between Dom Martin's text and his illustrations, nevertheless, it is possible, from these and from Dom Lamothe's notes on the mosaics, to form some idea of the appearance and date of the destroyed church and its sumptuous decoration.

Two marble columns, V or VI century, from the Church of Notre-Dame La Daurade, at Toulouse
*(Courtesy Metropolitan Museum of Art)*

If no authentic documents exist for the early history of the church, there is an abundance of legends; for example, that the church was originally a pagan temple to Minerva or Apollo, built over the fabulous lake where was concealed the famous "or de Toulouse." But these legends are unsupported by facts. It would appear that the original building was from the first a Christian church, decagonal in plan, with six long sides and four short. It was roofed with a segmental cupola pierced by a central shaft, through which the light entered, as well as from a series of windows around the upper part of the walls. The interior walls were subdivided horizontally into three tiers of shallow niches formed by round-headed arches resting on columns.

In date this decagonal building may be assigned to the fifth or sixth century. Some time after the construction of the original church, it became necessary to enlarge the edifice, which was done by removing three of the long walls and adding a nave, the remaining part of the old building forming the sanctuary of the enlarged church; it was in this form that the church was seen by the seventeenth- and eighteenth-century writers. There are reasons to believe that this enlargement occurred not long after the completion of the original building, that is, within the general period of the fifth or sixth century. It was presumably at the time of the remodeling of the church that the walls of the sanctuary of the enlarged church were covered with mosaics, in which the liberal use of gold gave to the church its name of La Daurade (deaurata = daurade = dorée).

In the niches of the top tier were figured scenes of the Nativity and Epiphany—the Birth of Christ and the Adoration of the Shepherds, the Visit of the Magi to Herod, the Adoration of the Magi, and the Massacre of the Innocents. Figures of Christ and of His mother occupied the central niches in the middle tier above the high altar. They were flanked by the four archangels, the princes of the apostles, the evangelists and other apostles, the four major prophets and other Old Testament figures. In the lowest tier were lesser prophets, royal ancestors and patriarchs, and a scene of the archangel Gabriel with the three

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** Reprinted in part from an article by Joseph Breck in the Bulletin of The Metropolitan Museum of Art.*

† *L'Abbé Degert, Les Mosaïques de l'ancienne Daurade, à Tolose, in Bulletin de la Société Archéologique du Midi de la France, Nouvelle Série No.* 34, *séances du* 29 *Novembre* 1904 *au* 31 *Janvier* 1905.

youths in the fiery furnace. The wall spaces outside the niches were also richly decorated with designs of peacocks, doves and other ornamental motives.

Although the Flight into Egypt might have been added to the scenes of the infancy of Christ and other Old Testament personages introduced in the lower tiers, nevertheless, the presumption is certainly in favor of the belief that the mosaics as described by Dom Lamothe formed a complete scheme planned for the sanctuary of the remodeled church. The mosaics, which show Byzantine influence, must have been made earlier than the middle of the eighth century, since the invocation of the archangel Uriel, represented in the Toulouse mosaics, was forbidden by the Roman Council of 745. Various indications point to the fifth or sixth century as the period of production.

A Further View of the Sargent Decorations in the Boston Museum of Fine Arts

THIS photograph has all the character of an architectural projection, and shows the decorations as the architect would naturally plan them. Considering the different parts in relation to the whole it will be noted there is an absence of a sense of scale. Apollo and the Muses and the corresponding panels are one scale, not quite the same. The Three Arts is a different scale and the Sphinx and Chimera still another, while the small round pendentive paintings are unlike any of the others in scale. The same is true of the sculpture.

For further illustration of these decorations and descriptive article, see THE AMERICAN ARCHITECT, issue of March 29 (No. 2390).

Owing to an oversight it was neglected to state that the photographs of details used in the illustration of Mr. Blackall's article, are copyrighted by the Boston Museum of Fine Arts.

# Notes on the Illustrations

### Humble Oil & Refining Co. Building, Houston, Tex.

CLINTON & RUSSELL, ARCHITECTS

*(See Plate Section for illustrations)*

THE building for the Humble Oil & Refining Company, a subsidiary of the Standard Oil Company, Houston, Texas, is a building in which especial attention was paid to local climatic conditions. It may be said to be a good example of regional architecture. The building fronts on three streets and the arrangement provides for the maximum of sunlight and air. The building has a ground area of 31,500 sq. ft. and the area of each upper floor is 26,395 ft., the total floor area being about 264,000 sq. ft. with a net rentable area of 237,000 sq. ft. The ground floor is designed for stores with large show windows and a generous area reserved for a gymnasium for employees of the company. The greater part of the building will be devoted to the use of the Humble Oil & Refining Company.

The excavations were started in January, 1920, and the building was completed in September, 1921. The exterior walls are of face brick with limestone trimmings. The frame is of structural steel and the floors are of reinforced concrete covered with linoleum. The interior partitions are of clay tile and also gypsum tile, the roof being of clay tile covered with mastic. The staircases have mahogany trim, the office doors and trim being of hollow metal. The building is heated with steam and lighted by electricity. There are four Otis overhead worm gear traction machine elevators operating at a speed of 400 f.p.m., each with a capacity of 2500 lbs. The architects were Clinton & Russell, New York City, and the general contractor was James K. Stewart & Co., Inc.

### Equestrian Statue of Francis Asbury

AUGUSTUS LUKEMAN, SCULPTOR

*(See page 346)*

MR. LUKEMAN has interpreted the spare and tireless circuit rider in long heavy cape of forward swinging line and broad, brimmed hat, absorbed in meditation, his mind far above the country lanes he travels. Settled low in the saddle, which during long days of travel and of preaching has become his study, he holds his well-worn Bible. One finger marks the place upon which the book is closed, while the preacher is oblivious to the immediate cares of his journey.

It is one of those periods of deep thought, when his tired horse, mindful of his master's mood and left to his own unguided will, has stopped momentarily. With arched neck, he reaches down and rubs his nose against his knee, still wet, perhaps, with the water of some stream just crossed.

Never before in an equestrian group has this pose of the horse been used, this downward swing of the head to the knee. No artificial pomp, or stilted conventionality, or showy splendor in the group could have so forcibly expressed the simplicity and truth of the figure.

**Town Hall, Suippes, France**

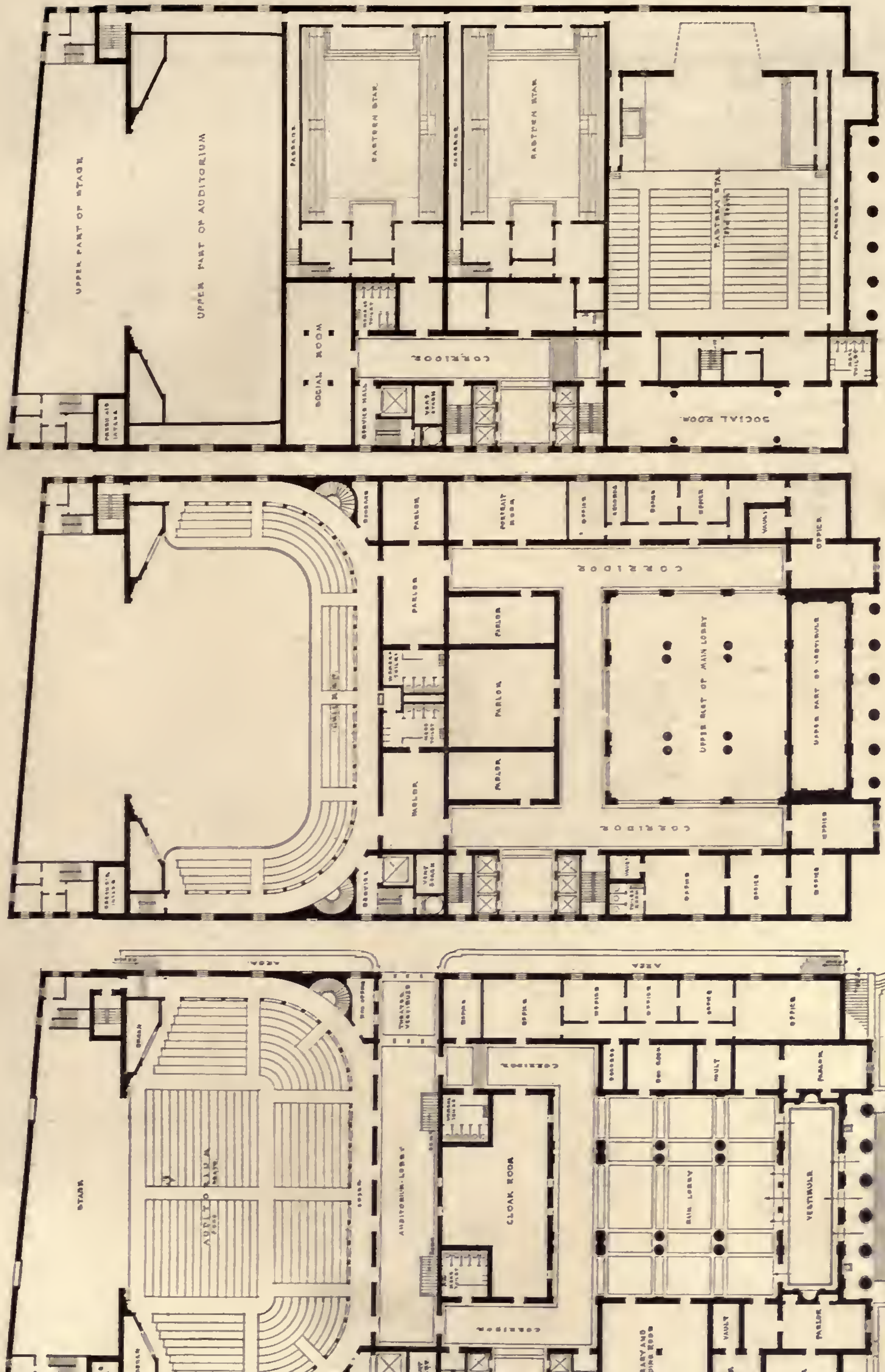
*(From a Photograph by R. M. Blackall)*



PRELIMINARY STUDY FOR A MASONIC TEMPLE, TO BE ERECTED ON LINDELL BOULEVARD, ST. LOUIS, MO.

THOMAS CRANE YOUNG, OF EAMES & YOUNG, AND ALFRED B. GROVES, ASSOCIATE ARCHITECTS

*(From a rendering by Hugh Ferriss)*

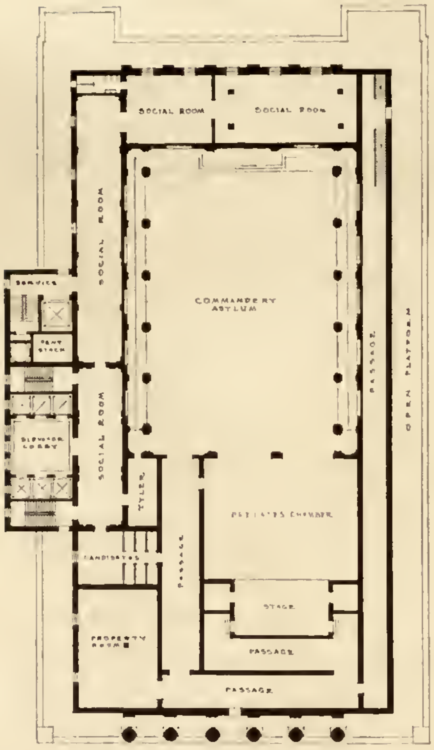



SECOND FLOOR PLAN

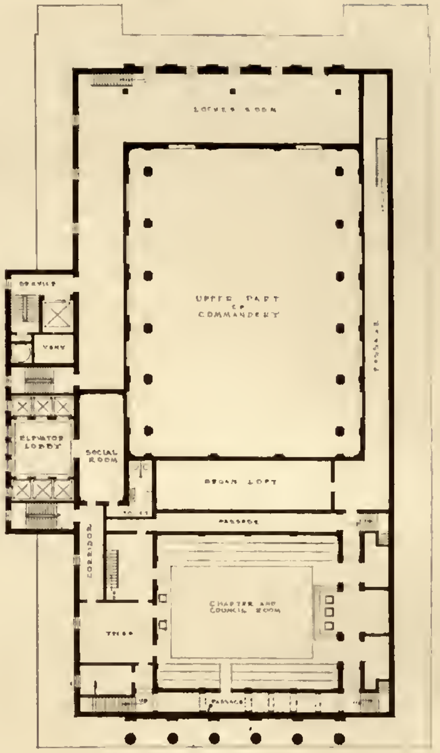
FIRST FLOOR MEZZANINE PLAN

PRELIMINARY STUDIES FOR A MASONIC TEMPLE TO BE ERECTED ON LINDELL BOULEVARD, ST. LOUIS, MO.

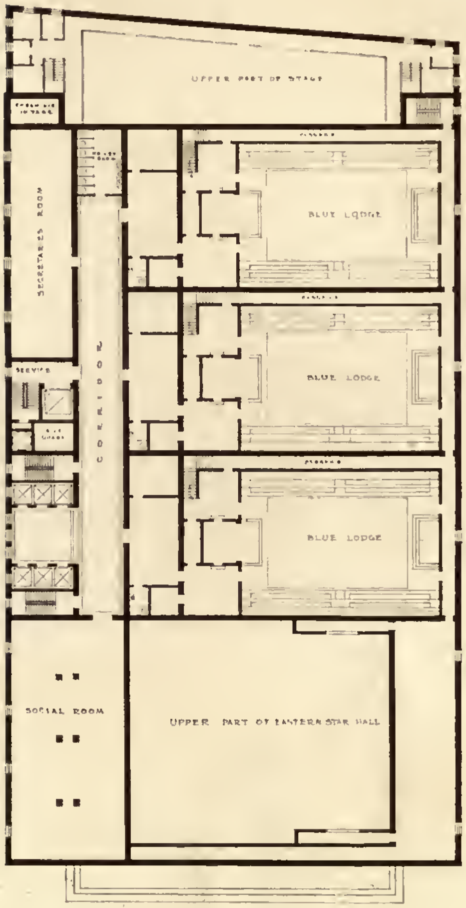
THOMAS CRANE YOUNG, OF EAMES & YOUNG, AND ALFRED B. GROVES, ASSOCIATE ARCHITECTS



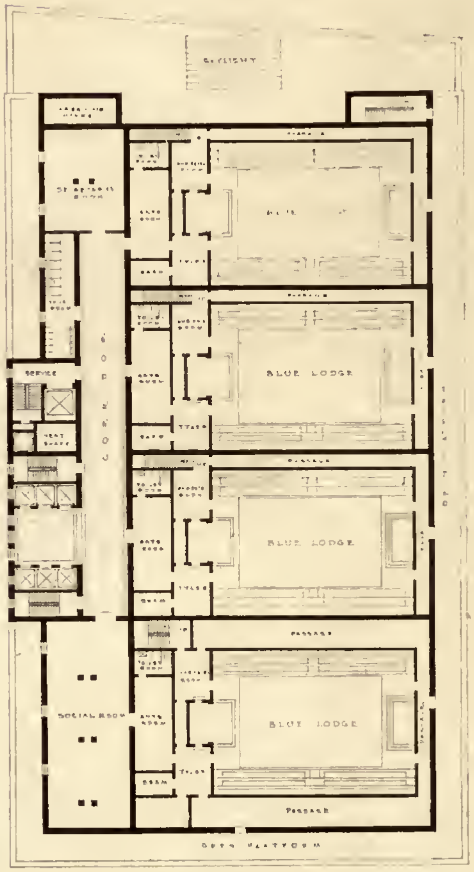

FIFTH FLOOR PLAN




FIFTH FLOOR MEZZANINE PLAN



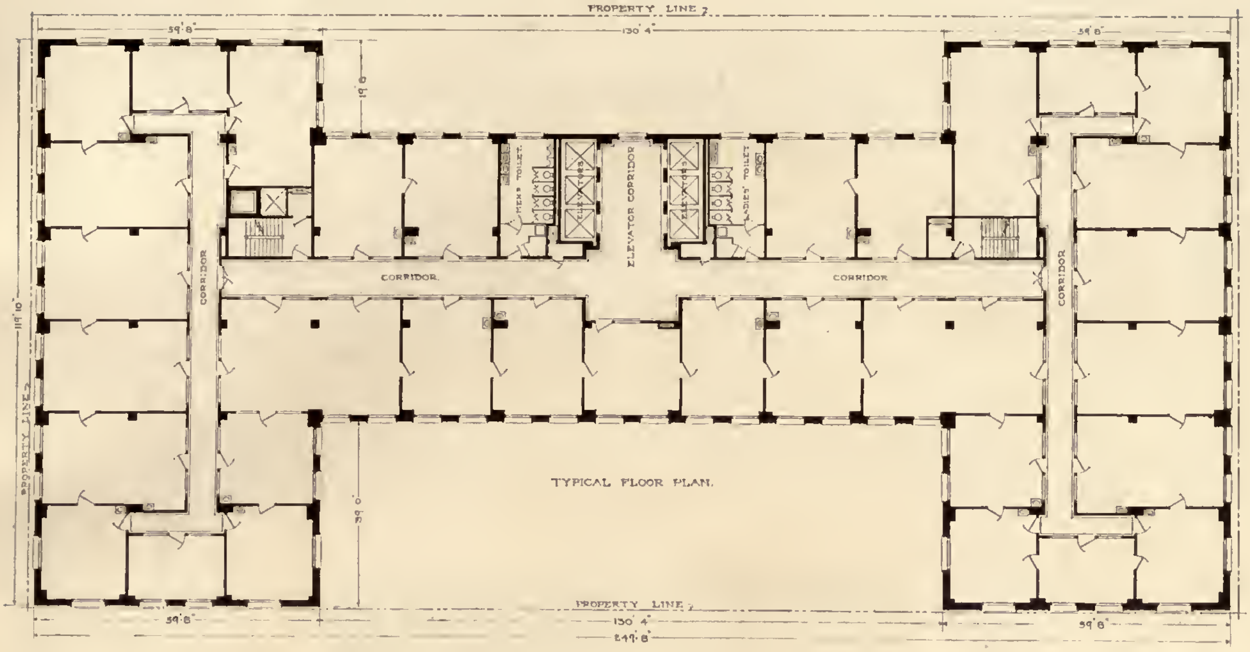

THIRD FLOOR PLAN

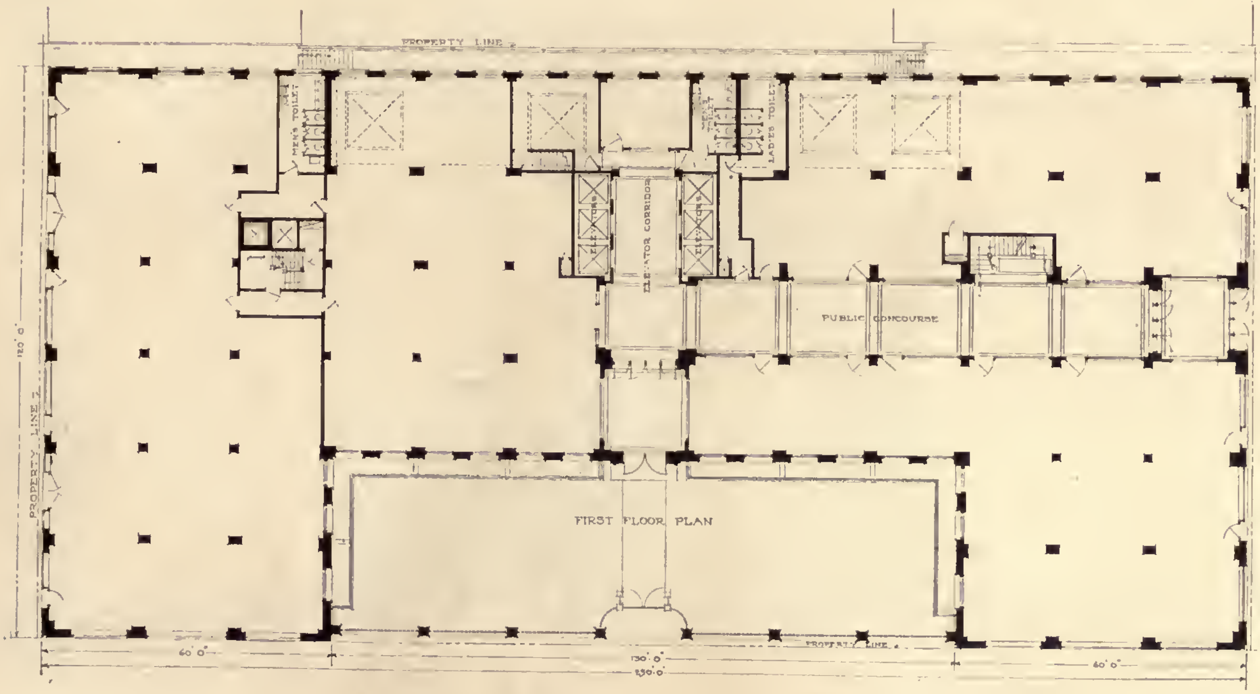



FOURTH FLOOR PLAN

PRELIMINARY STUDIES FOR A MASONIC TEMPLE TO BE
ERECTED ON LINDELL BOULEVARD, ST. LOUIS, MO.

THOMAS CRANE YOUNG, OF EAMES & YOUNG, AND ALFRED B. GROVES, ASSOCIATE ARCHITECTS




FIRST AND TYPICAL FLOOR PLANS

BUILDING FOR HUMBLE OIL & REFINING CO., HOUSTON, TEXAS

CLINTON & RUSSELL, ARCHITECTS

*(For exterior and interior views see Plate Section)*

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

THE *Architectural Record, March.* Leon V. Solon in his third article on Polychromy deals with the technique of color effect, and the structural materials available. What he says is interesting and is well illustrated and his plea for the logical use of clay products is sound, if not novel; but just how this logical use of polychrome material can be adapted to modern architecture is not as yet clearly expressed by Mr. Solon. From the statement in a preceding article that the supporting members, that is to say the column and the architrave, are not ornamented, it may be presumed that it is the intention to construct these members of stone and the rest of the entablature in terra cotta or faience, a method of construction which may indeed be logical but certainly is not monumental. Any burnt clay product is necessarily restricted in size and is apt to be uneven in outline. It is conceivable that the metopes and possibly the triglyphs might be constructed of that material, but the cornice could not be. Then, too, the difference in texture and finish between the stone and the clay is so great that all effort of unity in the order would be lost. It is quite true that Greeks did mix stone and clay and even wood in some of their temples, but it is probable that the entire surface was given a finish that was substantially uniform. Then, too, it must be remembered that the Greeks did not use stone as we Northern races do; apparently they did not see any beauty in the stone itself, nor any monumental value in the expression of its construction; they concealed the joints to the best of their ability and carefully smoothed the marble to provide a field for the decoration, and if marble was not available they covered the rough limestone with stucco. And so with them was possible a form of exterior decoration that is not in accordance with our taste, nor our methods of building.

From "The Architectural Record"

East Loggia—Villa Dei Collazzi, Tavarnuzze, Tuscany

Harold Eberlein illustrates very fully the Villa Dei Collazzi in Tuscany which is rather better than the other villas recently published; and there is an article on the Lamont house by Walker and Gillette, in which article Mr. Matlack Price predicts that in 1940 perhaps some critic may say "a new kind of sanity appeared in city house architecture about 1922" etc., the sanity apparently being the successful effort to make picturesque details appear unpicturesque when symmetrically applied to a square box.

In the Portfolio of Current Architecture there is an interesting church interior by Maginnis and Walsh and a charming little stair detail in a store in Cleveland by Carl W. Broemel. and a farm group in Oyster Bay by Alfred Hopkins, who is unsurpassed in this line of work. Just to show how difficult it is to collaborate, Mr. James K. Smith publishes two schemes for a Memorial Park by Fellows of the American Academy in Rome, in which an architect, a sculptor, a painter and a landscape architect work together on each scheme, the results being quite what might be expected.

In the March issue of *Architecture* is featured the Library at Louvain, by Warren and Wetmore, very fully illustrated by excellent though small reproductions of the working drawings. The plan is interesting and simple, perhaps too simple for the style of architecture which has been adopted. The scheme seems a little too regular and balanced and while undoubtedly practical, lacks the charm of the older work.

John Van Pelt writes of the combination of church and school in one building and shows how he has solved the problem in the case of Our Lady of Victory. The building is, from obvious reasons of economy and lack of space, rather boxy, but some of the detail, particularly of the entrance doorway, is excellent. The store fronts in Washington that George Ray has done have really remarkably good detail of a most refined character, but the fenestration is not always happy, though this is less apparent in execution than in the photographs.

*Journal of the American Institute of Architects, March.* In Shadows and Straws, the Editor quotes at length from Manchester and elsewhere certain wise words, as he terms them, anent

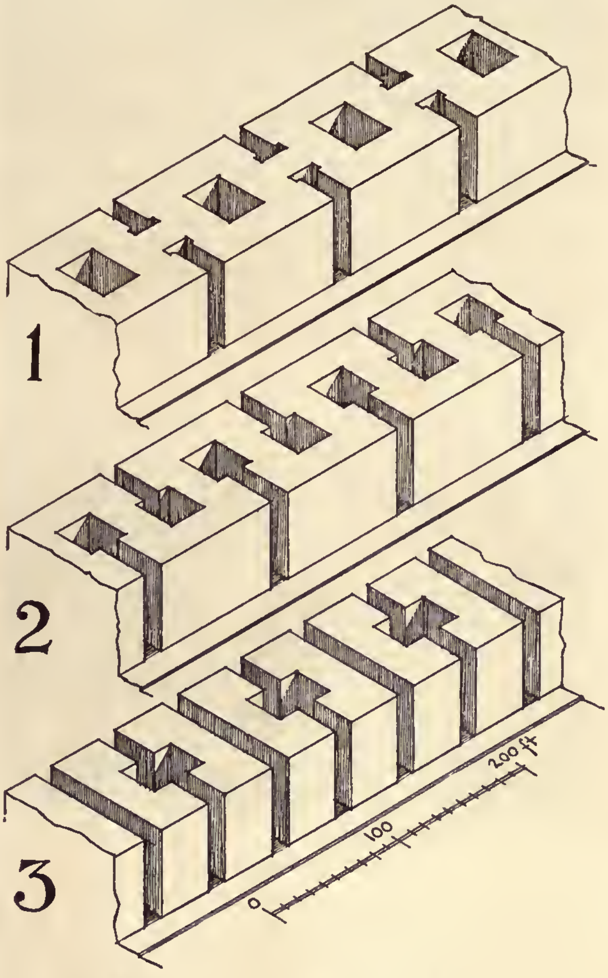
From "The Architectural Record"

Farm Group—Oyster Bay, Long Island, N. Y.
Alfred Hopkins, Architect

criticism of works of art; "The public ought not to lean too much upon the professional critic," who, it appears, criticizes halftone plates with a grand manner and flourish of trumpets and a vampire flapping of wings, all of which of course, especially the halftone plate outrage, is quite reprehensible. R. W. T. has a very good article, which he calls the Boomerang, on the wildcat competition fallacy that could well be reprinted as an Institute Document: and William L. Steele writes of the Architect and Engineer; a long article with various subheadings somewhat like the snappy head lines in a Middle Western newspaper. Apparently Mr. Steele does not like the French manner, nor the Beaux Arts men, with their "French tricks and smocks and expensive suites of offices" who "titillate the susceptible at pink teas." A shocking state of affairs truly! and everyone can readily see that the real and vital architecture of the future will be done, not by these gentry but by the serious youths with green shades over their eyes and with neat little aprons over their stomachs and with their sleeves carefully fastened up with elastic garters, and always with a slide rule conveniently handy; in fact, just the sort of youth that is to be found pictured in the advertising sections of most of our architectural magazines.

S. F. and F. S. Campbell give an interesting historical account of the Abbey of Glastonbury, apparently written as a preface to a description of the psychical research of Mr. Bligh Bond and his friend John Alleyne in the relocation of the Edgar Chapel, and other ruined portions of the Abbey. These two gentlemen, after reading to each other, hand in hand, a history of Japan, got in touch with some disembodied person who spoke

From "The Journal of the A. I. A."

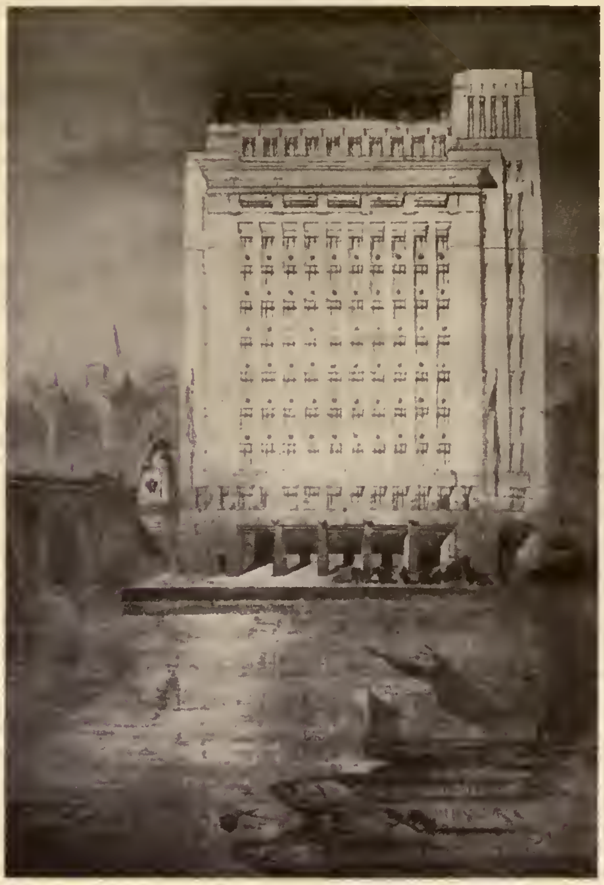



The three types as they would appear in block development.—1. The Prize Plan. 2. Mr. Hood's Plan 3. Mr. Thomas's Plan. After many thousand years of progress man has gained such mastery over the material world that a large percentage of one-half of the population may choose circumstances permitting between these several types as his place of abode

or wrote ragbag Latin, and signed himself Gulielmus Monachus, and who very considerately and quite correctly gave them a lot of detailed information, and even drew plans for them; and there seems also to have been one Johannes, who also came across as it were. We have heard before of the ghost system in English Competitions, but F. B. B. seems to have gone that one better, or rather two better. Nothing like having a handy spirit around in these days, to counteract the high cost of draftsmen's wages. We may find that Patience Worth is regularly employed in some St. Louis office and that Ouija Boards are being equipped with ruling pens.

F. L. Ackerman has an article on the Phelps Stokes Fund Tenement House Competition and seems to prefer the plan submitted by Andrew J. Thomas. We are not familiar enough with the competition program to express an opinion on the judgment nor on the relative merits of the plans in detail, but from a common sense point of view, Mr. Ackerman is entirely right. The Thomas plan is much simpler, more economical and more livable, and Mr. Ackerman's isometric view clearly shows the great advantage in block development.

From "The Architects' Journal," London



Adelaide House, London Bridge, Elevation to River
Sir John Burnet and Partners, Architects

*The Architects' Journal, London, March* 1. The English papers have devoted a great deal of space to a lecture given by Mr. Arthur J. Davis before the Royal Institute of British Architects. Mr. Davis is a wet architect, so he said, a distinction that we should not imagine would be unique in that favored country, but on second reading it appears he referred in that way to his profession as a naval architect. He is the designer of many of the interiors in the modern liners and illustrated his lecture with photographs of Palm Gardens, Salons and Swimming Pools and spoke of the materials and methods of construction now in use, saying that plastered ceilings were quite common and very satisfactory. On being asked why an effort was not made to give a more nautical appearance to the interiors, he said that when he started his work he had the same idea, and had tried to introduce the curved lines of old-time ship construction and dolphins and that sort of thing, but that the owners induced him to make a crossing himself, and he found out that the people who travel nowadays are not especially enamored of the sea, nor were they fond of dolphins or even pirates. They were mostly seasick American women who would much prefer imagining they were in a hotel. All of which has a strangely familiar sound. The people who produce rotten plays say they do so because the public demands it. The movie magnates would really prefer to produce historical and moral scenarios but the public demands the other. A real estate corporation builds a skyscraper that cuts off all the light and air from their lowlier neighbor only because the public demands it. And so it goes. And the public seems to believe them and goes to the rotten plays and sees the salacious movies and rents the offices in the higher building. But do they really want it? To our way of thinking they do not, but they go to the plays and cross the ocean on these floating hotels because they have to if they go at all. If a person is going to be seasick he will be seasick whether he is in a cabin that looks like a cabin or in one that looks like the foyer of a third rate hotel in Peoria. Some day a wet architect will design a real boat that looks like a boat and great will be his name.

From *The Architect, London, March* 10, we reproduce a criticism which is timely in view of the rather extended notices given this extraordinarily successful effort to secure Governmental sanction and support to a nonsensical theory. "We have received from Mr. Harald Aars, of Christiana, a pamphlet in which he gives an account of a careful analysis he has made of Dr. Macody Lund's work, "Ad Quadratum," and it is very aptly prefaced by a quotation from Ruskin: "Do not think of one falsity as harmless, another as slight, and another as unintentional. Cast them all aside." Mr. Aars has examined a large number of the diagrams of "Ad Quadratum," many of which he finds incorrectly drawn, and others, when compared with larger drawings, incorrect in themselves. He further points out the convenience of small diagrams for one who, like Dr. Macody Lund, wishes to make out a case. The diagrammatic lines with which the small-scale plans are covered are so coarse and thick that it is difficult to check their accuracy. We ourselves went over some cathedral plans according to Dr. Lund's system, and in no case could we find any real correspondence. The whole work must be put down as either the most amazing result of inaccurate drawing or as an attempt to deceive; and, seeing that the mistakes are in every case those which go to help Dr. Lund's theories, the last and least charitable conclusion would seem to be the more correct. We are surprised that the advisers of the Norwegian Government can ever have given the honor of their sanction to such an amazing production, but we hope they may yet, in the interests of truth and accuracy, disavow it and relegate the tissue of phantasies to the fate it deserves."

*The Architectural Forum, March.* The Henry E. Huntington Library in San Marino, by Myron Hunt, is a very interesting building with a landscape setting of the luxuriance that is possible only in California, and there is also illustrated a little Rest House at Mt. Auburn Cemetery, Cambridge, by Ralph Harrington Doane. Lewis E. Welsh has some very good examples of modern Colonial work, the Overlook cottage being very unusual, and the Town Hall at Greenfield, N. Y., simple and of excellent character. There is also a very good example of what can be done in commercial work as expressed in the lower portion of the Chicago Pneumatic Building, a view of which is herewith reproduced. Under the heading of Decoration and Furniture there are a number of illustrations that are well worth preserving.

From "The Architectural Forum"

Lower Stories of Chicago Pneumatic Building, New York
C. W. Fairweather, Architect

*The Architectural Review, London, March.* There is published a paper on Verona, recently read by W. G. N. before the Liverpool Architectural Society, illustrated by photographs and by the author's sketches, which is interesting, but is remarkable chiefly for the fact that W. G. N. considers the exterior of the Porta del Palio much finer than the interior face and speaks of the "pleasant and unusual treatment of the smaller doors." The treatment may be unusual but is far from pleasant, as the warmest admirer of the work of Sanmicheli will acknowledge.

There is a short article by Theodore Fyfe on the Scottish Survey; a collection of examples of Scottish architecture illustrated by photographs and drawings of the rugged bleak castles so typical of that country; and there are also some illustrations of the Uppingham School War Memorial, the last work of the late Ernest Newton, R. A., a small octagonal Gothic shrine, connected with the chancel of the present chapel, the interior treatment of which is unusual and successful.

From "The Architectural Forum"

Library For Henry E. Huntington, Esq., San Marino, Cal.
Myron Hunt, Architect

*The Journal of the Royal Institute of British Architects, March* 11, publishes a paper by H. S. Goodhart-Rendel on the Relation of Plan to Elevation which was read recently before the Liverpool School of Architecture. What Mr. Goodhart-Rendel has to say is well worth saying even if it has been said before; it is good, practical commonsense as applied to design and furthermore it is very well said, as the following short extracts will show: "Some people's way of expressing civic state in a block of municipal offices seems to be by hiding the plan within perfectly featureless walls and then plastering a peristyle all round it. Such folk remind me of dealers who deodorize home-spun tweed and then sprinkle over it the scent of peat-smoke out of a bottle." And also "By architectural truth, however, I do not mean hair-splitting. The architect who exhibits on his elevations every small irregularity of his plan is like the man who answers the question 'How are you?' by detailing every small irregularity of his stomach. If one window in a range has a higher sill than the others, and looks ill in consequence, it is adding insult to injury to explain that this is the expression of the pantry sink. . . . Either the pantry sink must remain unexpressed or else the symmetry of the façade must go. And the symmetry of the façade may be the obligatory expression of the general layout of the plan, a thing somewhat more important than the location of the plumbing."

From *The Architects' Journal, London, March 15th.* We reproduce a sketch of Adelaide House by Sir Robert Burnet and partners. This is a commercial structure facing Fishmongers' Hall on the North end of London Bridge, and is interesting as showing what the English architects are doing with high buildings.

### Amendments to the New York Registration Laws

Editors, The American Architect:

YOU are, of course, aware that the State Legislature has recently passed some amendments to the New York law for the registration of architects.

One of the principal amendments is that which makes it the duty of the Attorney General to prosecute offenders. The want of a clear provision on this point in the law as originally enacted has handicapped the Regents in its enforcement.

Another amendment which will interest many of your readers is that which extends the exemption period. It will now be possible for competent architects who were in actual practice in New York State prior to the twenty-eighth day of April, 1915, to obtain registration certificates without examination if their applications are filed before the end of the current year, 1922, and on condition that they satisfy the Board as to their qualifications. All such architects may continue to practice without a certificate if they so desire. The amendment of the law does not affect the requirement in this respect, except to provide that every architect practicing without a certificate will have to file an affidavit that he was in *bona fide* practice one year before the law was enacted.

A third amendment to the law requires the payment of an annual fee by every registered architect in the State. This amendment was made at the request of the Regents who consider that this requirement will prevent fraudulent use of certificates and keep the list of registered architects free from dead wood. The annual fee for re-registration is $2.00, payable on or before September 1.

The other amendments are chiefly verbal ones in the interest of making the law more concise and clear, and removing one or two ambiguities.

One item of interest to the profession will be, that a definition of an "Architect" is now incorporated in the registration law, which reads as follows: "'Architect' means one who designs plans for structures and superintends or supervises their construction."

There is no change in the fundamental requirement of the law, that no one can practice architecture in New York State, or call himself an architect, without obtaining a certificate of registration, with the exception of those who were in the practice when the law was originally enacted.

The attention of all registered architects should be called to the fact that each is subject to heavy fine if he does not have recorded in the office of the County Clerk in the county in which the applicant resides, his certificate of registration, and have the certificate stamped upon the back by that official—fee $1.00. In case of loss of the certificate, the Board of Examiners should be notified.

Correspondence in reference to the registration law and requests for application blanks, or information relative to the law, should be addressed to the Board of Examiners and Registration of Architects, Education Building, Albany, New York. Payment for registration and annual re-registration should be sent to the same address.

D. Everett Waid,
*President, New York State Board of Examiners and Registration of Architects.*

### New York Society of Architects

THE April meeting of the New York Society of Architects was noteworthy for the reason that there was an unusually large attendance. The Society expressed its approval of a recent decision by Justice Giegench, which gives architects the right of lien against property, whether they superintend construction or not.

The following were elected members of the Society: Edwin H. Denby; Aymar H. Embury, II; Richard H. Hunt; Maurice Deutsch; Thos. F. Price; Matthew Del Gaudio.

The Treasurer's report showed the Society's finances to be in excellent condition.

The next meeting will be the Society's annual convention, and will be held at the Astor Hotel, on which occasion there will be an entertainment for members and guests.

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## KNICKERBOCKER THEATRE COLLAPSE

### Report of the Investigating Committee Appointed by the Associated General Contractors of America

#### INTRODUCTION

*AT a meeting of the Executive Committee of the Associated General Contractors of America, held immediately after the collapse of the Knickerbocker Theatre, a committee representing engineers, contractors, and the public was authorized to make an investigation and report of the matter for the Association. This committee was appointed as follows: Rudolph P. Miller, Consulting Engineer, formerly superintendent of the Building Department, New York; James Baird, Vice-President, George A. Fuller Company, and Guy Mason, of Mason and Spaulding, attorneys, Washington, D. C. W. P. Christie, Research Engineer of the Associated General Contractors, served as secretary and technical assistant to the committee.*

*The importance of the subject warrants the publication of the report in full with reproductions of the accompanying illustrations.*—EDITORS.

#### PART I

##### CAUSE OF THE COLLAPSE

The collapse of the Knickerbocker Theatre roof is attributed by this committee to unseating of the north end of the main truss, primarily through failure of the northernmost top gusset plate of that truss and the bottom chord where it rested on the Columbia Road wall. This half-inch gusset plate, which furnished the only lateral stiffness of a heavy upper chord, buckled to the west, and the lower chord where it rested on the wall, without reinforcement for bearing stresses and eccentricity was crushed and tilted under a combination of tension, compression and torsion, or twisting stress. This action, which is later explained in more detail, culminated from many weaknesses of design, the most vital of which were as follows:

*First*: The over-stressing of steel roof members which produced excessive downward deflection of the main truss. This over-stressing resulted from (a) using loads for the design which were greatly exceeded by the actual load, (b) from reducing the height of the main truss, as originally designed, and (c) from failing to splice the top and bottom moment plates which were placed on the truss in short sections, and did not butt together.

*Second*: The designing of the main truss bearing so that the center of stresses fell on the edge of the wall, thus producing eccentricity and tension in the bearing.

*Third*: The failure to anchor trusses to the walls, especially over a short skew bearing at the wall support of the main truss. This design failed to provide for the additional outward thrust against the wall which developed, at such a bearing when the truss is deflected.

*Fourth*: The failure to reinforce the bottom chord of the main truss where it bore on the wall or even to connect the channels of this chord where they extended beyond the gusset plate to form the bearing. Thus no adequate provision was made in the bottom chord for three additional stresses acting upon it, over and above the load which it carried as a member of the truss. These stresses were (a) the full load of the north end of the truss, (b) a twisting caused by the skew bearing, and (c) the tension caused by the center of stresses falling on the edge of the bearing instead of at the center.

*Fifth*: The omission of a cover plate at the junction of the top chord and batter post of the main truss, thus limiting the stiffness of the truss to that of a half inch gusset plate at that point.

*Sixth*: The placing of a heavy concentrated load on a high and relatively thin hollow tile wall, neither adequately braced nor integrally bonded and further weakened by many openings and chases.

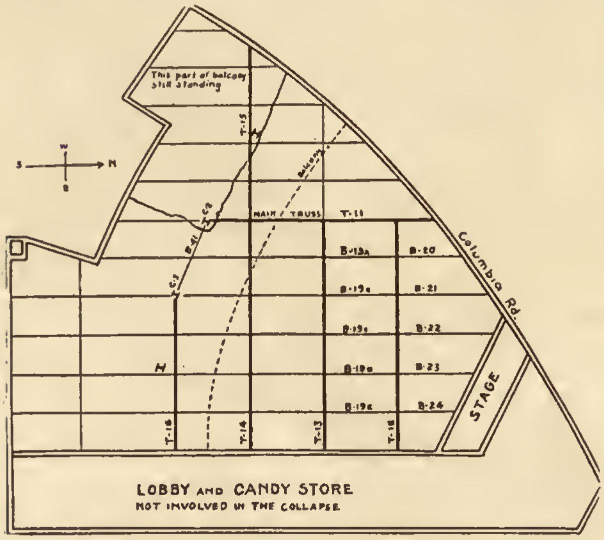
*Seventh*: Lack of adequate diagonal or other bracing throughout the steel structure and especially around the two columns carrying roof trusses, thus providing insufficient rigidity to the structure as a whole.

One or possibly all of these weaknesses might have been present in the building without causing collapse—had their effects been distributed to various parts of the structure; but unfortunately it occurred that these effects combined and concentrated at the north end of the main truss. The culmination of this condition in a final collapse is herewith summarized:

As already mentioned, the actual roof load greatly exceeded the design load; the main truss was reduced about nine inches in depth from the original design, and its moment plates were neither butted together nor spliced. These factors all produced excessive downward deflection of that truss. This deflection, acting on the skew bearing, created a thrust at the Columbia Road wall, which tended to push the wall outwardly and to twist the bottom chord of the truss. Either of these movements, occurring in but a small degree, was capable of unseating the truss, as its bearing perpendicular to the wall was only six inches and that parallel to the bottom chord eight inches. (See Fig. 2.)

To resist this twisting force the only stiffness provided was that of a half-inch gusset plate and of the bottom chord in the first panel. The batter post could contribute nothing as its rigidity was in turn limited by a half-inch gusset at its upper end. (See Fig. 11.) Thus the bottom chord, from the twisting force alone, was probably in a hazardous condition. Furthermore, the two 12-inch channels forming this member extended beyond the gusset plate with their webs unsupported, forming an eccentric bearing. (See Figs. 5 and 10.) These webs therefore took practically the full bearing load of the truss and the stress from its eccentric bearing as well as the twisting force. Under such a combination of stresses failure in the bottom chord, or bearing, was at some time almost inevitable. A condition existed that would have been dangerous with a thoroughly adequate wall, and when with this was combined a thin wall badly cut up by openings, a condition must have existed which awaited but an additional load, a measure of vibration or fatigue of the over-stressed metal to result in a collapse.

The additional load and probably the vibration and fatigue were present when the roof gave away. A snow load of some twelve or thirteen pounds per square foot, or about 16 per cent. of the dead load (computed from precipitation recorded by the U. S. Weather Bureau), exclusive of possible drifting, and the heaviest since completion of the building, was on the roof. Vibration from passing street cars had been noted on the structure and was doubtless accentuated at times by a double eight-foot ventilating fan carried on the roof. The snow load which increased the dead load at the north end of the main truss some 15,000 pounds was, so to speak, the last straw in destroying equilibrium at the support. It undoubtedly provided the additional stress necessary either to buckle and twist the member resting on this bearing, or to buckle the gusset plate above. Which action took place first it is impossible to state, but that both actions did occur is shown by the distorted steel members and marks on the north bearing. (See Figs. 2, 3 and 4.)




Note.—Over column C-2, which stopped at the bottom chord of truss T-11, a strut was erected to carry three beams at the roof level. This arrangement is shown in perspective in Fig. 5-C. This strut framed into the bottom chord of the truss so that C-2 had no lateral bracing other than that provided by 6 bolts through the flanges of the truss. Column C-3 extended up to the roof. The other two columns shown stopped at the balcony floor.

Fig. 1. Roof Framing Plan Knickerbocker Theatre

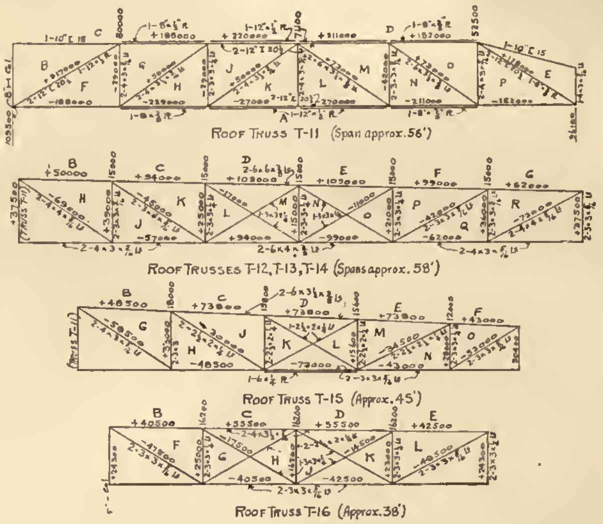
When the web of the east channel of the bottom chord buckled, the top of that member (not the whole truss) was twisted eastward, thus unlining the batter post, and moving the center of stresses off the bearing. With the bottom chord in this condition only the lateral stiffness of the wall could prevent the truss from sliding off. This stiffness the wall did not have. It was pushed outward about five inches—sufficient to break its bond with the stage wall, to break the stage wall itself, and to allow the truss to drop.

Whether the upper gusset plate or the bottom chord channel failed first is immaterial, as either action would have brought about the other and would have thrown the batter post out of line. Once this member was displaced, collapse readily followed. Unlining or distortion, of the batter post is a condition that easily results in failure of even a well-built truss.

No failure of an auxiliary truss was essential to unseat the main truss, and no failure of a beam, as they were actually erected, is believed to have been capable of causing a failure in the auxiliary truss T-12. In no member of the steel, except the bottom chord mentioned, has any evidence of failure between supports and before falling been found. Collapse through a succession of preliminary failures seems highly improbable in view of the difficulty experienced in efforts to cause collapse when demolishing structures.

It is common knowledge to men of experience in the wrecking of old buildings that a sudden collapse or giving away of any large portion of the structure can be affected only by destroying a major supporting member. The only member of this nature existing in that area at which eye witnesses say the failure began was the north end of the main truss and the suddenness with which this truss collapsed seems to preclude the possibility of it having been unseated by the failure of a minor member of the steel framing.

Various reports on the Knickerbocker have assigned the collapse to one or another preliminary failure, while at least two have located the initial action at the north end of the main truss. For the purpose of bringing out more clearly the actual and probable facts, the more comprehensive theories advanced are reviewed in Part II of the report. There also is given a more detailed discussion of conditions present in the structure, together with sketches, evidence, descriptions and further reasons for believing that failure did not originate in any auxiliary member of the structure.




Note.—This figure does not appear in the report. It was copied from the drawings filed with the Building Department and is here given in reply to requests for the data. No dimensions were given on the originals which were drawn to scale.

Figure 1B. Stress Diagrams of Trusses

## Responsibility

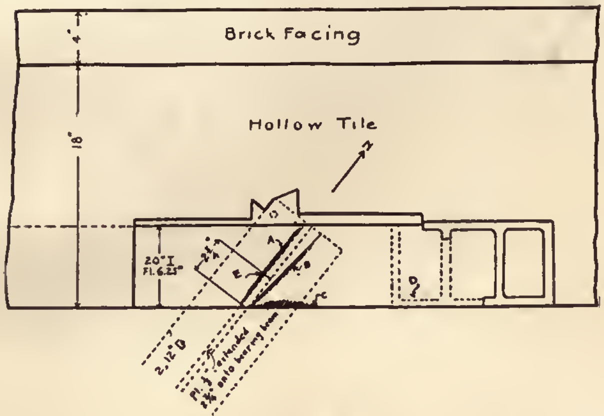
In the erection of a building, particularly a building to be used as a public gathering place, all persons engaged in designing and erecting the structure, like the operators of public utilities are jointly and severally responsible for its safety. This responsibility is entailed by the fact that their operations are intimately connected with the public welfare.

The highest degree of responsibility undoubtedly rests upon the architect, as it is upon him that an owner relies for a properly constructed building; but every other agency involved in the project has an individual responsibility for the character of its work. This individual responsibility may be somewhat limited by practical limitations of service, but, nevertheless, it is constantly present. Each agency presuming to render construction service, from the contractor to the fabricator, is obligated to communicate to the architect any knowledge that may bear on the safety of the structure. If any agency finds that, in its judgment, changes should be made in the plans to insure structural safety, it is the duty of that agency to notify the architect. The co-operation of the local building authorities should also be constantly sought.

It is essential that a clear distinction be made between design, design details and construction before responsibility can be determined. For this reason, a brief statement of what comprises the service and duty of each agency is given in the following sections:

### 1. Municipal Approval and Inspection

Municipal approval and inspection are a service rendered to the public to insure it that buildings shall be erected in conformity with zoning, occupancy, health, building code and other requirements laid down by public authority. Its scope may include, in some instances, investigation into features of design, but completely to check the design of each structure erected would exceed the working capacity of a municipal building department. It would require a staff of experts almost equal to the combined forces of private designers and would entail an expense and duplication of work too great for a municipality to bear. Field inspection also is limited by a like consideration of expense. Inspectors are obliged to cover an extended area of the city and to divide their time between a great number of buildings. Strict detailed field inspection would require an inspector constantly on each building, as a great amount of work may be executed in his absence. So far, this has been an excellence of service which the building department's appropriation will not permit. Therefore, to ascertain whether an employee of the department is culpable because weaknesses of design or construction are incorporated in a structure, it is necessary to determine whether it was reasonably possible for him, considering the magnitude of his duties, to detect those weaknesses.




A and B indicate the bearing marks made by adjacent edges of the lower chord channels, showing that these edges spread apart while the truss was on its seat.

C indicates abrasion under the east flange of the chord.

D indicates tile broken by the end of the truss and by a vertical strut framed on to the extension of the lower chord.

E shows the north edge of the gusset plate.

Note.—The two 12-inch channels forming the bottom chord of the main truss had but 8 inches of bearing on the west wall measured along the center of the chord. They also overran the gusset plate 5½ inches. Thus the two channels were practically independent of each other as far as bearing strength is concerned. This arrangement also placed the center of stress on the edge of the wall, producing an eccentricity of about four inches. The two channels with their ends free, therefore, were subjected not only to the end load of about 110,000 pounds but also to the bending stress caused by this eccentricity. The web of the west channel at the end was still straight after the collapse, while that of the east channel was rolled up as shown in Fig. 4. Fig. 3 shows the probable position of these webs prior to collapse as indicated by the bearing marks. Fig. 4 shows their condition after the collapse.

**Fig. 2. Sketch of North Bearing of Main Truss Showing Position of Truss on the Bearing**

The function of the building inspector's force is analogous to that of the police force, and it can be held responsible for infraction of building regulations in just so far as the police force can be held for infraction of other laws. In neither case should the full responsibility for the result of such infractions be shifted to the guardians of public authority. In the case of the Knickerbocker, responsibility for the disaster cannot be justly laid to employees in the department of building inspection, except in so far as it may be shown that an official or employee has failed in his duty of apprehending any violation of the building code. But even if this is finally shown to have occurred, it would in no sense relieve the other agencies of construction from their respective responsibilities. Such a course would not only be equivalent to charging a policeman with responsibility for a murder in his precinct, but it would set a dangerous precedent in removing from architects, engineers and contractors the responsibility for their actions.

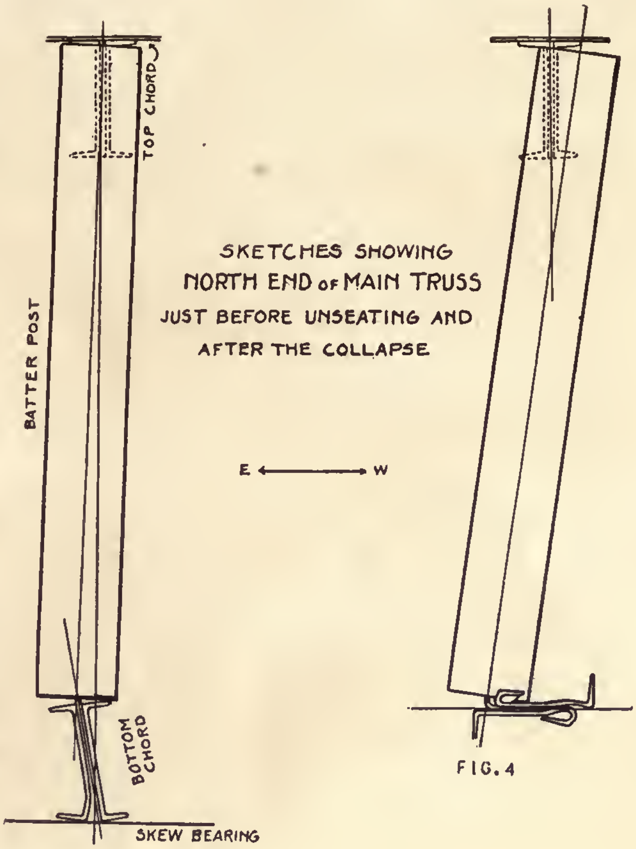



Fig. 3 shows the probable condition of the lower chord prior to unseating of the truss as indicated by the bearing marks shown in Fig. 2.

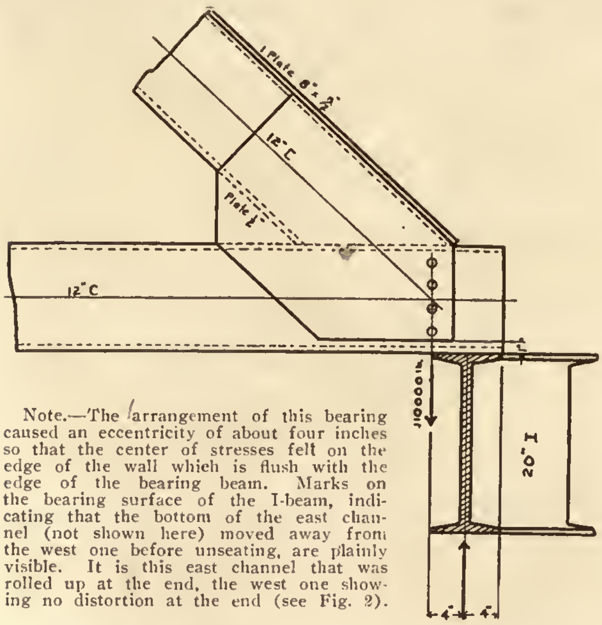
Fig. 4 shows the approximate condition of batter post and chords when the members were separated by cutting torches during the rescue work.

**Fig. 3** **Fig. 4**

### 2. Design and Supervision

Design and supervision constitute the service rendered by an architect, or an architectural firm, to a client who is the owner. Unless otherwise agreed between these two parties, the former is obligated to execute a safe design; to supply adequate plans and specifications for estimating the cost and erecting the building, and to furnish supervision that will insure its erection in accordance with these instruments. This service may not include the drafting of detailed working drawings which are sometimes made by the contractor or a manufacturer, but it does include checking and approving such drawings regardless of their origin.

To insure that the owner's building shall be erected as specified, the architect should place on the work an inspector or superintendent. This supervision serves not only to safeguard the interests of the owner, but also, in public buildings, to insure the safety of the public. Even when the architect is confident of the constructor's skill and responsibility the failure to provide this supervision is a dangerous practice which cannot be too strongly condemned; and it is especially dangerous when adequate detail drawings and specifications are lacking. The contractor is not a designer, does not know the stresses which




Note.—The arrangement of this bearing caused an eccentricity of about four inches so that the center of stresses felt on the edge of the wall which is flush with the edge of the bearing beam. Marks on the bearing surface of the I-beam, indicating that the bottom of the east channel (not shown here) moved away from the west one before unseating, are plainly visible. It is this east channel that was rolled up at the end, the west one showing no distortion at the end (see Fig. 2).

Fig. 5. Sketch Showing West Half of Main Truss and Bearing at Columbia Road Wall

determine the design, and should have adequate supervision and consultation to execute the work as it is planned.

If any parts of the building, built in accordance with plans and specifications as either drawn or accepted by the architect, are found to be inadequate or improper, then he cannot avoid responsibility for the condition of such parts. Neither can he disclaim responsibility for violation of the plans and specifications, if laxity in supervision has made such violation possible; though in the latter case the agent of the violation should be held fully responsible for his own acts.

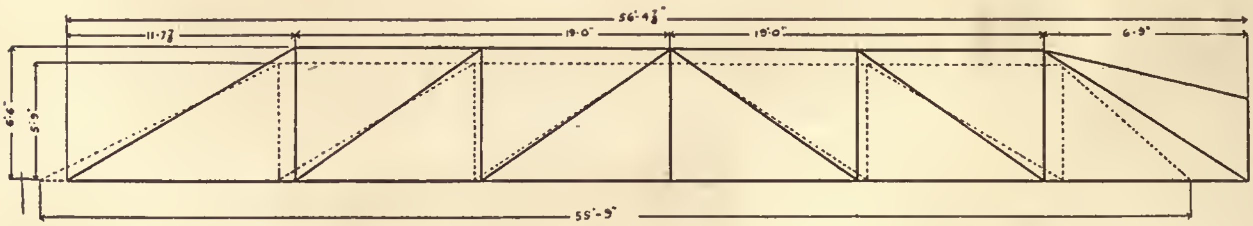
by the architect upon their approval. Adoption of this design obviously entailed responsibility to the owner for its safety, but, on the other hand, did not in any sense release the fabricator from responsibility for departures from safe practice.

As the details of structural steel fabrication are practically standardized, the responsible fabricators may usually be relied upon to execute a safe design for any given conditions. Many of them maintain thoroughly expert designers whose system of detailing and checking practically precludes an error. For this reason individual architects have placed in them a great degree of confidence. But the steel design of the Knickerbocker contained serious departures from established practice, which are believed to have been a vital factor in the collapse, and while the architect may be culpable for not checking it, the fabricator, in whom he relied, cannot escape his moral responsibility for these departures. A tabulation of items showing departure from safe design is given elsewhere in the report.

## 3. Construction

Construction, which is a service carried on under the supervision of an architect and performed by the general contractor, consists in furnishing materials and building the structure as shown by the architect's plans and specifications. It involves the sub-letting of various portions of the work which the general contractor's organization does not perform, and generally carries with it the responsibility for the work performed under such sub-contracts. It does not include design. However, it may occur that a sub-contractor seeks to change some feature of the design in order to simplify the construction or because certain materials are difficult to obtain. In that event he prepares a design, or such drawings, as may be required to show the alteration, and these must be accepted by the architect before any change or substitution is allowed. In such instances the sub-contractor obviously becomes an agent of the architect in supplying a design, as well as an agent of the general contractor in executing the work. For ultimate execution of the work, in accordance with the design, the contractor should be responsible, but for the adequacy of the alternate design he should share no responsibility.

The situation here cited occurred in constructing the Knickerbocker, and the design has been found inadequate, but it should be pointed out that unless the construction has varied from this design, or from other plans and the specifications, the contractor should not be held responsible except in so far as he may have been a party to an infraction of the law. Otherwise expressed, he is responsible for the character of workmanship and materials




The solid lines represent the stress lines of the main truss, as shown by the fabricator's stress sheet. The dotted lines represent the stress lines of the fabricated truss, as determined from measurements taken after the collapse.

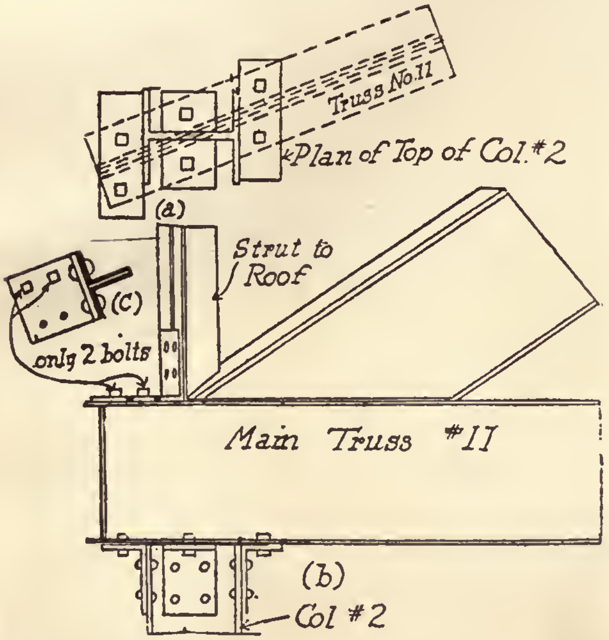
Fig. 5A. Stress Lines of Main Truss

In so far as any portions of the Knickerbocker Theatre, which were built as shown by the plans and specifications, are found to be a departure from the dictates of safe practice to that extent the design and supervision are responsible. In considering this matter, however, cognizance should be taken of an unusual circumstance involving design of the steel roof members. The fabricator, on account of difficulty in securing certain material, submitted an alternate design of his own, and this, it appears, was approved by the building department and accepted

as specified in his contract and for infraction of the building code.

No evidence has so far been found to indicate that the building was not constructed in accordance with the plans and specifications, except that evidence given at the coroner's inquest indicates that the contractor added a reinforced concrete band running through the full length of the wall which carried the main truss, and strengthened the hollow tile under the truss support with concrete. This, it was testified, has been done because the wall seemed to the contractor to be of inadequate strength and in need of reinforcing. An examination of the wreckage indicates that the contractor used materials of suitable quality throughout the construction and that the workmanship was of a kind that should be expected in work of this nature. Several defects of workmanship have been found in the structure, but they appear to be of a minor character and not involved in the collapse. These defects are discussed elsewhere in the report.

In view of the evidence obtained by the committee's investigation, and by that of the coroner, no responsibility appears to rest upon the contractor by reason of the quality of his work or any non-compliance with the plans and specifications; but by conforming to these instruments, as required in his contract, which did not provide for anchoring trusses to the walls, he was made a party to infraction of the building code. Under the Washington Code, which places responsibility for observance of its requirements upon "any person or persons, whether as principal agent or employee," it appears that violation thereof entails joint and several responsibility.




The vertical strut shown carried three beams as indicated in Fig. 5C. This strut bent over on the side where the two bolts were missing, breaking the two which were in place. Had the missing bolts been in place, they would not have resisted this action. [*Redrawn from sketch by T. L. Condron.*]

Fig. 5B. Arrangement of South End of Main Truss

## 4. Ownership

Ownership is charged in the erection of a building, and especially of a building used for public gatherings, with securing such design and supervision service as will insure its safety. It is the duty of ownership to insist upon adequate inspection and to pay a fee for architectural service sufficient to provide such inspection. If the owner presses his architect to reduce this fee below that commonly recognized as necessary to give adequate inspection he should not expect the building department to relieve him of responsibility for such action. Should the owner induce his architect to reduce the cost of structural design at the risk of endangering its safety, he jointly with the architect should share responsibility for the results.

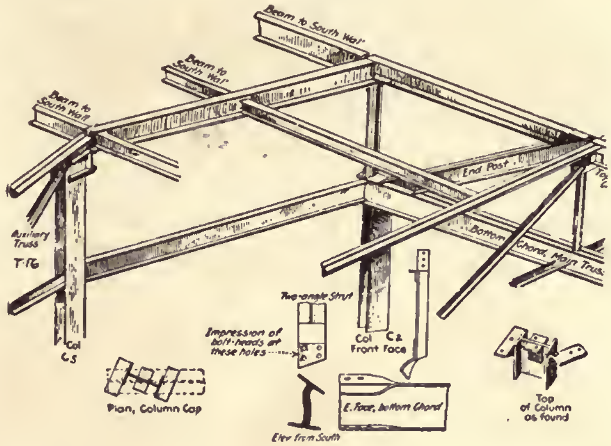
In the case of the Knickerbocker, the architectural fee, as shown by evidence at the coroner's inquest, was lower than that advised by representative architects, and an examination of the building indicates that while the decorative features were elaborately executed, structural features were inadequately provided for. Whether any action of the owners resulted in this condition has not been determined, but, if so, the ownership should share the responsibility.

## Recommendations

Investigation of the Knickerbocker disaster has forcefully emphasized four factors which have vital bearing upon the failure of this structure and which this committee believes should be called to the attention of owners, engineers, architects, contractors and public officials.

### 1. Building Approval and Inspection

Under the present system of providing funds and administering municipal building departments it is seldom possible fully to check every design or to provide constant inspection of the work—the appropriation is too small. Expenses of the department are often drawn from the general tax funds, and thus place a burden upon all taxpayers, for services rendered for the most part to but a few. Under this system the department does not receive sufficient funds to render the service desired.




The lower strut between the two columns was not in the original design. This sketch shows the flimsiness of the design at column C2, which was displaced from the truss without distortion. [*Redrawn from Engineering News-Record.*]

Fig. 5C. Arrangement of Steel at Columns C2 and C3

More extensive service could be provided if a charge, depending upon the value of a structure and sufficient to pay for checking design and for inspection, were made for each permit. This would place the cost of such service upon those who build, and would require from the general fund only an appropriation necessary to cover clerical and other general expense of the department. The cost of permits upon buildings used for public gathering could thus be made to provide whatever degree of inspection is advisable.

### 2. Design and Supervision

The expense of designing, drafting plans and supervising the construction of a modern building are fairly well established, and the fees which must be charged an owner to cover the expense of this work and provide a reasonable profit, are fixed within rather narrow limits. These fees cannot be substantially reduced without lowering the character of service rendered. They are generally adhered to by representative men of the profession and are recognized as a reasonable minimum charge.

Some members of the profession, however, on account of strong competition in the architectural field and the tendency of owners to shop for professional services as they would for coal, will accept inadequate fees; and when they do are obliged to reduce the expense of design and supervision to such an extent that they are unable to furnish adequate supervision or complete plans, specifications and details. This condition forces the contractor, whose function is not to design, to construct the building without sufficient drawings as best he can. The safety of a structure may rest upon these details and failure of the designer to provide them constitutes a dangerous gap in his service. In the case of the Knickerbocker the plans and specifications were not complete, and testimony before the coroner showed that the inspection was inadequate.

(C) *Underwood & Underwood*

This photograph shows the structure of the Columbia Road wall, the crack where this wall joins the stage wall, and where it pulled the stage wall apart. It also shows the north main truss bearing and truss T-12.

The stage wall crack runs diagonally downward from the bearing of beam 22 in that wall, which is the westernmost of the three stage wall bearings. The main truss bearing spans the third window from the stage in the Columbia Road wall.

Truss T-12, which is resting with one end on the east wall, shows sharp buckling on both edges of the top chord, where this member was pinched by the beams on each side as it preceded them in its fall. This truss was cut to pieces in the rescue work.

**Fig. 6. Interior of Knickerbocker Theatre Looking North**

In any building there are items of construction unforeseen by the designer which must later be added, but when, on a structure like the Knickerbocker, costing about $77,000, there are more than fifty such items, there would appear to have been incompetence, indifference, or both.

The committee recommends that the fees of architects and engineers be made sufficient to enable them to give competent and complete service. Fees recommended by the American Institute of Architects and the American Institute of Consulting Engineers are reasonable and proper and have had recognition by the courts.

### 3. Standardized Building Code

Municipal building codes throughout the United States have generally developed independently by a process of accumulation, until it is now practically impossible for either an architect or a contractor to have cognizance of all the provisions in force in the various localities of his work. Many of those codes are deficient in vital particulars, to such an extent that an unsafe structure can be built without infraction of the regulations; for example, light and flimsy wall construction which in the Knickerbocker Theatre was a weak element if not a direct cause of the collapse. A comprehensive and well-arranged code in any city would doubtless tend to reduce the possibility of disaster.

### 4. Registration of Architects, Engineers and Contractors

Licensing of architects and engineers before they are permitted to practice has been advocated by various groups within these professions for some time, but the effectiveness of this requirement in preventing disasters seems questionable. Such a measure might merely limit the number of persons engaged in these professions.

What is needed is a method of fixing a greater responsibility for safe and legal work. The committee believes that this can be accomplished by requiring designers, and constructors as well, in all branches of building work, to seek registration with the building authorities before permits are issued to them. Such registration should be withheld if the applicant is unable to show his competency, responsibility and willingness to comply with legal requirements. In accepting the permit the registrant would further assume responsibility for the safety and adequacy of his design and for its execution in accordance with the conditions of the permit.

While the registration fee might be nominal, the penalty attached to violations of the permit should be sufficiently exacting to make the provisions effective. Cancellation of the permit and loss of the right to operate for a given period would doubtless prove effective. Registration of this kind would tend to restrict the planning and erection of building to those who are competent and responsible—a result that is greatly to be desired.

This committee recommends that engineers, architects, contractors and public officials be urged to advocate application of these recommendations, and, if necessary, the adoption by proper legislative bodies of laws putting them into effect.

(C) *Underwood & Underwood*

This photograph shows the great amount of open space in the wall which is, in general, 18 inches thick, 40 feet high, and composed of two thicknesses of tile. At that section showing in white, the top is pushed out five inches. The wall shows three or four cracks from top to bottom to the right of this area.

**Fig. 7. Columbia Road Wall of Knickerbocker Theatre**

## PART TWO

### History of Construction

The construction of the Knickerbocker Theatre was begun late in 1916 and completed in the fall of 1917. The original steel work consisted of beams and girders, following the general layout as constructed, but the difficulty of securing certain materials during the war period prompted the fabricator to submit a design of his own involving a system of trusses which could be built from material on hand. This design was approved by the building department but, according to testimony at the coroner's jury, never checked by the architect.

During the course of construction a strut not originally contemplated was added to furnish bracing between the two columns supporting roof loads, and at the instance of the contractor, a reinforced concrete girdle was built into the west wall, at about its center and extending practically throughout its length.

The roof slab, which has been considered an important factor in various analyses of the collapse, was poured about the first of June, 1917.

## Description of Building

The shape of the building was approximately that of a half segment of a circle, with the arc running parallel to

(C) *Underwood & Underwood.*

This photograph shows column C-2 with its bottom resting on the balcony and its top resting on the ground. This column is not deformed and still has much of the plaster clinging to it. In the foreground is shown truss T-12 with beams 23 and 19d still attached. Near the top of the picture is a section of the roof slab. This slab, though but three inches thick, was capable of withstanding the shock of falling.

Fig. 8. Interior of Knickerbocker Theatre Looking South

Columbia Road and one side paralleling 18th Street. Part of the building at the intersection of these two walls was occupied by the theatre stage and a store and that portion facing 18th Street by the lobby. Neither that part of the building comprising the store nor that comprising the lobby was involved in the collapse. (See Fig. 1.)

The curved wall, which is the only one concerned in the roof failure, varied from 13 to 22 inches in thickness, but the main body of it was 18 inches thick, and composed of two thicknesses of 8-inch hollow tile with a space of about two inches between. On the street side of the wall was a facing of brick, stone or stucco approximately four inches thick, which under the Washington Code could not be considered as an integral part of the wall. The average height is slightly over 40 feet above the sidewalk.

The steel work as constructed consisted of a main truss 6 feet, 6 inches deep which rested with one end on the curved wall and the other on a column. This truss, running north and south, carried certain beams and four auxiliary trusses, three from the east wall and one from

This view of the wall bearing of beam B-22, looking north, shows the actual bearing surface outlined by cement which was spilled upon the bearing plate during construction. The undisturbed cement and the tile on the left side of this bearing indicate that beam B-22 did not leave its support by moving westward. This action is a fundamental factor in various theories of collapse which have been offered.

Fig. 9

the west. Another truss with certain beams rested with one end on the east wall and the other on a second and the only column extending to the roof. The upper flanges of all beams and of the top chords of trusses, excepting the two batter posts of the main truss were imbedded in the concrete roof slab.

The roof slab having an average span of about 10 feet, was three inches thick, and reinforced with No. 6 wire mesh, three inches on center. The ceiling was suspended partly from the steel members and partly from the roof slab. On top of the slab was a layer of cinder concrete varying from three to nine inches to furnish drainage slope; and upon this was a four-ply composition roofing covered with slag. The actual weight of trusses, beams, slabs and covering was approximately 75 pounds per square foot.

At about the center of the roof was a double eight foot ventilating fan with motor and housing weighing probably two tons. Further details of the structure are shown by the accompanying sketches and photographs.

## Description of Collapse

The roof of the theatre collapsed about nine P. M. on January 28, 1922, while between four and five hundred persons, an unusually small audience, were in the building. At the time of the collapse a heavy snow storm was in progress; in fact, the heaviest since the building was constructed and which placed upon the roof a depth of snow of approximately two feet, exclusive of likely drifting.

The roof fell bodily into the pit carrying with it approximately the eastern two-thirds of the balcony. The column under the main truss which did not extend to the roof was pushed out from under the truss without being injured. This column rested on one of the balcony columns which did not fail and was joined to it by bolting through two spliced plates. The only column extending to the roof was buckled by the truss framing into it and the load of this column fell upon the balcony buckling the column directly beneath and one other column supporting the balcony.

The main truss was practically undistorted outside the north panel where the lower chord which formed a bearing on the west wall was buckled and twisted about 90 degrees. The gusset plate above this chord was buckled and torn while the batter post and top chords were thus thrown out of line about four inches; otherwise, none of the members of the main or auxiliary trusses show indication of failure before falling.

The Columbia Road wall was found five inches out of plumb at the main bearing, shattered at the southwest corner where an auxiliary truss rested upon it, and cracked practically through its height in three other places. These three cracks show in the brick and stone facing and it has not yet been ascertained whether they extend also through the tile. This wall pulled away from the stage wall about two inches at the top and pulled that wall apart, about halfway between the stage and the Columbia Road wall.

This photograph of the north end section of the bottom chord of truss T-11 shows the effect of a twisting stress, which, combined with the bearing stress, turned the bottom chord off of its bearing on the Columbia Road wall. Note that the west flange at the end is undistorted, while the east flange is curled up against the web. This bottom chord section is the only member found to show evidence of failure before falling. The fact that the corner of the bottom west flange is not injured indicates that a twisting of this member occurred before it struck the floor. Outside of the first panel the truss appears to have been but slightly unlined during the collapse.

Fig. 10

The main truss apparently fell free of the Columbia Road wall as no scratching is evident; but the four auxiliary trusses on the east side did scar the east wall with their bearing ends during the collapse. The flanges of the bearing beams which carried the wall end of these trusses were bent downward, with the exception of the northernmost which is practically straight, and the southernmost which carried a truss independent of the main truss.

The slab was badly shattered by the fall but in the southwest corner it remained suspended without rupturing over a span of about 20 feet.

Eye witnesses testify that a crack was seen to open in the plaster up near the left of the stage and that an instant later the roof fell. A witness who sat in the balcony near the column of the main truss testified that there was no noise nor disturbance in that vicinity before the crack at the stage was noticed or before the collapse occurred. The testimony given shows rather conclusively that the initial movement, regardless of its cause, occurred in the vicinity of the west side of the stage.

This photograph shows the omission of a cover plate at the upper end of the north batter post of the main truss, and the manner in which the gusset plate buckled toward the west. The stiffness of the heavy upper chord was limited to this half-inch plate. The top chord was cut during the rescue work.

Fig. 11

## Defects of Design

It is difficult to draw a distinct line between what constitutes design and what constitutes the detailed work of the designing service necessary to make it complete. Both elements, however, are a part of the whole field of design and are therefore treated together in this section. These defects are as follows:

### A. Walls

(1) The Columbia Road wall of the structure was not a safe wall for the heavy concentrated load placed upon it. It was approximately 40 feet high, 18 inches thick and not integrally bonded. About 45 per cent. of its length was occupied by openings. Even a solid brick wall of this height and length would have required a minimum thickness of at least two feet to accord with good practice. (See Figs. 6 and 7.)

(2) A skew bearing was used on this wall to carry the heavy concentrated load of the main truss and no provision for anchorage was made. Such a bearing should have special consideration in its design to guard against the tendency to slide sidewise. The actual bearing surface was only six inches wide normal to the wall, and only a small movement of the wall or truss was necessary to cause unseating. (See Fig. 2.) The omission of anchorage was an infraction of the Washington Building Code.

### B. Structural Steel

(1) The main column, C-2, supporting the main truss was in itself, given no lateral bracing, and no bearing plate. Its ends were not milled and at its connection with the column below was merely bolted through two splice plates which enabled it to carry practically no stress except a simple vertical load. This condition was greatly responsible for the completeness of the collapse which occurred in the vicinity of the balcony.

(2) Sufficient lateral bracing to give the structure stiffness as a whole was not provided. This was a contributing cause to the collapse. (See Fig. 5C.)

(3) No reinforcement of the bottom chord was provided to take care of bearing stresses and of the canting action caused by the skew. This was one of the main causes of the collapse. The bottom chord shows conclusive evidence of failure through bearing.

(4) The center of stresses of the lower chord and batter post at the north end of the main truss came on the edge of the wall bearing, giving about four inches of eccentricity. This caused additional stress in the chord which was not provided for.

(5) The channel of the bottom chord extended about five and one-half inches beyond the gusset plate at the north main truss bearing without a filler between the webs so that their bearing strength was greatly reduced. These webs were thus dangerously overstressed and one of them shows every indication of having failed before the truss dropped.

(6) Moment plates on the top and bottom of the main truss were put in in sections and neither spliced nor butted together. They were thus unable to transmit the stress from one panel to the other, which forced the top and bottom chord channels to carry the full stress, this contributing greatly to the deflection of the truss.

(7) No cover plate was placed over the batter post and top chord of the main truss. This limited the lateral stiffness of the compression chord to that of a half inch gusset plate. This gusset plate failed at some time during the course of the collapse and is one of the most critical weaknesses in the steel design.

(8) Moment plates of the main truss were broken at panel points which were not supported laterally, thus decreasing the lateral stiffness of the truss. The top chord of the truss buckled at these points, probably during the collapse.

(9) The distance between stress lines in the stress diagram was used as the outside dimensions of the truss which reduced the effective depth of the main truss about nine inches. (See Fig. 5A.) This also was a factor in increasing the deflection of that truss. Also the center of stresses of the diagonals did not pass through the center of stress at the panel point.

### C. Roof Slab and Loads

(1) The roof slab was too thin for the load and length of span used, and while not a primary factor in the collapse, was a distinct departure from good practice and capable of producing a local failure.

(2) The stress sheet shows no provision made for the load or vibration of the double eight foot ventilating fan carried on the roof.

(3) The actual dead load of the roof as designed and constructed was about one-third more than the load which appears to have been used in computing stresses. This added greatly to the deflection of the main truss which was an important factor in the collapse.

### Defects of Construction

Defects of construction consist of poor workmanship, use of faulty materials and variations from the plans, and specifications and building regulations. If the contractor furnishes the material and builds the structure as the architect described it, then the structure's weaknesses are not considered as defects of construction for which the constructor was responsible. Defects of this nature found in the Knickerbocker Theatre were as follows:

(1) The bearing plate of beam B-24 was so placed that this beam had only a partial bearing at the wall. This defect, however, apparently had no influence upon the collapse, as it was not unseated until the truss fell.

(2) The strut over column C-2 where it fastened to the top of the bottom chord of the main truss, was provided with four holes for anchorage to that member. The chord itself, however, was provided with but two holes, thus two bolts on one side were omitted. The holes should have been bored and the bolts inserted. This strut, however, bent over against the side which was not bolted and the absence of these two bolts cannot be assigned any responsibility for the collapse. (See Fig. 5B.)

(3) A number of light colored hollow tile were used, which were considered by some to be of inferior quality, but evidence before the coroner indicates that tests of these tile have shown them to be of the usual commercial strength.

(4) The Columbia Road wall and the stage wall were not bonded for a distance of six or seven feet at the top. Such bond as existed, however, was sufficient to break the stage wall about half way between the stage opening and the Columbia Road wall so that this defect is not regarded as a contributing cause of the collapse.

## Review of Other Analyses of Collapse

A number of theories seeking to explain the initial collapse of the roof have been advanced in the press and at the coroner's inquest. The evidence upon which they are based has been carefully studied by the committee which has checked practically every point mentioned with the evidence existing at the structure. It has found that some of these theories have not mentioned a number of important facts. (See Fig. 1.)

### A. Theory of Joint Committee of Army and Navy Engineers

The report of the Army and Navy Engineers attributes the roof collapse primarily to failure of the bearing under beam 21. Presumably the expansion and contraction of the roof slab moved the Columbia Road wall and reduced the area of this beam's support. The bearing then failed through crushing of the tile allowing beam 21 to drop and causing the roof slab to pull beam 22 sideways toward Columbia Road until it also left its support. When these two beams fell they released beams 19b and 19c by breaking the bolts which fastened these two sets of beams at their union with truss T-12. T-12 buckled, then pulling off the main truss T-11 from its Columbia Road support, thus causing the entire roof to drop.

The condition of the steel members and wall bearings which this Committee has found at the site of the building, is incompatible with the action outlined by the above theory. That such action could not have taken place is believed to be shown by the following facts:

1. At wall bearing 22 the cement which was spilled on the bearing plate at the west side of the beam was not disturbed and a piece of the tile projecting from the wall could not have remained in place as it now does had this beam moved westward. Shortly after the accident there were distinct scratches on the bearing plates showing that beam 22 moved practically straight south. (See Fig. 9.)

2. Where each pair of beams, for example, B-20 and B-19a, framed into truss T-12 the flange of the top chord of that truss was buckled up sharply on both sides. Beams B-19d and B-23 are still hanging from the truss. On the underneath side of the top chord of the truss are distinct dents that could have been made only by a scissor action from each pair of beams as the truss preceded them in its fall. (See Fig. 6.)

3. If beam 21 had failed first, the top chord of truss T-12 should naturally have buckled first at that point, but the top chord is not buckled between beams 20 and 22.

4. The top chord of T-12 where beam 22 joins it is buckled and torn but the fracture is a clear tension failure and shows clearly the effect of the scissor action mentioned above, indicating that the fracture occurred after flange of the upper chord was pinched by beams 22 and 19-C.

5. Both beams at each connection were fastened with four bolts at their junction with truss T-12, and even if beams 21 and 22 had dropped first they could not have exerted a turning effect on T-12. The turning effect would be counter-balanced. Moreover, the top chord of this truss was imbedded in the concrete roof slab, which would greatly resist buckling before the fall.

6. If beams 21 and 22 had dropped from their wall supports and broken their truss connections, the first sign of collapse should have been the appearance of their north ends as they broke through the ceiling. This, according to eyewitnesses, did not take place.

7. That the Columbia Road wall could have been

moved outward by expansion seems improbable as the roof slab was poured about the 1st of June and at initial set probably possessed its largest volume. Also the roof was covered with cinder concrete and 4-ply composition roofing, and it is doubtful that any material change of temperature or volume ever occurred.

### Theory of Colonel P. M. Anderson of the War Department

This analysis is practically the same as that of the Army and Navy Engineers except that failure is attributed to the roof slab which presumably pulled beams 21 and 22 towards each other and off of their support. (See Fig. 1.)

This analysis is not supported by evidence in the wreckage. Pieces of slab examined directly under this point showed extra reinforcing of three-eighths inch corrugated rods which indicated that this was probably one of the strongest portions of the roof slab. The parting of this slab could not have pulled these beams toward each other, and since in the southeast corner of the building a slab of 20 feet or more is still holding together unsupported, this action appears unlikely. The same reasoning applies to this theory from the point where the two beams were unseated, as applies to the preceding theory.

### Theory of Mr. T. L. Condron, Consulting Engineer, Chicago, Ill.

This theory places the immediate cause of failure in the column C-2 at the rear of the theatre. Presumably, the column failed through over-loading. This allowed the south end of the main truss to drop pulling the north end from the wall and producing a general collapse.

This theory appears entirely plausible but it is not borne out by evidence of the structure nor by evidence given at the coroner's inquest.

1. Though this column was undoubtedly weak and overstressed it underwent no distortion throughout the collapse. It is still perfectly straight and coated with about half the plaster that was originally on it.
2. Had this column failed and pulled T-11 from its bearing, the last point of contact of this truss with the bearing would have been the northwest corner of the flange of the bottom chord. A load of some 55 tons would have been placed upon this corner. That this did not occur is evidenced by the fact that this corner even now, is not bent. (See Fig. 4.)
3. An eyewitness sitting in the balcony not far from this column who saw a crack open up at the left of the stage, noticed no noise or disturbance in the vicinity of the balcony before the crack appeared.

### Theory of Mr. R. M. Geare

This theory places the origin of collapse at the top chord of truss T-12 where beam 22 is attached; presumably, a weakness in the steel caused the truss to buckle at this point pushing the beams on the north side into the stage wall, this allowing T-12 to pull T-11 from its bearing. This action is believed impossible from the fact that the stage wall shows no evidence of the beam having punched through the hollow tile at the beam ends. The imprint of the beam ends in concrete that was spilled around them during construction is still intact and shows that no thrust occurred there. Moreover, the fracture in the flange of the top chord of T-12 is a clean tension break in a compression member and shows the effect of the scissor action of the beams on each side, which could not have occurred after the flange tore. The fracture mentioned appears to have been caused by falling of the truss and not by any buckling while on its bearing.

### Theory of Ernest B. Ruebsam, formerly in Charge of Structural Design for the Supervising Architect

This theory places the origin of failure in the gusset plate at the north end of the truss at the junction of the top chord and batter post. Presumably, the truss buckled at this point where the lateral stiffness was only that of the gusset plate. This caused the top of the batter post to move to the west, thus unlining truss T-11 and pulling T-12 from its wall bearing on the east wall.

This theory undoubtedly strikes at one of the weakest points of the structure and is in part, concurred with by this Committee. However, the action relative to unseating T-12 appears to have been unlikely. The east end of this beam did not fall clear to the bottom but caught on an opening at the second floor lobby. Had the east end of this truss fallen first and taken this position, it would have undoubtedly pushed the end of the main truss over to the Columbia Road wall. That this action did not occur is evidenced by the fact that the north end of the main truss did not touch the Columbia Road wall in its fall.

In this theory, however, are pointed out the most important weaknesses of the structure, such as excessive deflection of the main truss, lack of splicing moment plates, overloading of trusses, and general instability of the main truss at the bearing, all of which were contributing causes of failure. Failure of the gusset plate mentioned and distortion of the lower chord of the main truss actually occurred in the collapse, but it is difficult to say how much occurred in the fall itself.

### Analysis of the Engineering News-Record

This analysis attributes the initial failure of the unseating of the main bearing at the Columbia Road wall. It points out the weaknesses which contributed to this action and denies the possibility of failure having originated in any auxiliary member of the steel. In these and practically all other essential points the report of this Committee concurs.

# THE HOUSE WIRING PROBLEM

## The Wiring Committee of the National Electric Light Association makes an appeal to Architects

IN the March, 1922, *Bulletin of the National Electric Light Association,* is an interim report of a sub-committee of the N. E. L. A. Wiring Committee. This report proposes a classification of houses into four categories governed by the amount of wiring each house may contain.

The first classification would be when the service meter and one or two lights have been connected. This might be described as electric service in house.

The second classification would be the case which is only too common, of one light in most of the rooms, and but little more. This might be described as electric service in each room.

The third classification would be, in the opinion of the sub-committee, the minimum for a wired house, though not a well wired or adequately wired house. This might be one lighting outlet and also one convenience outlet in each living room (bed room, parlor, dining room, etc.) and an average of three such outlets per living room. This might be described as wired.

The fourth classification would be a reasonably well wired house with at least one lighting and one convenience outlet in each room and an average of five such outlets per room. Of course, under this classification a house with only the minimum two outlets in each room and none in closets, hall ways, etc., might theoretically get in the best classification by installing a 50 light chandelier. This, however, should not interfere with the practical use of the classifications.

The practical use will be, for instance, that when two wiremen are competing and one of them cuts down the amount of wiring to reduce his price his competitor may point out that one price is for wiring the house, the other merely for bringing in service.

Another use of the classification will be that when a real estate man advertises a house as wired the central station man or electragist may go to him and tell him he should do some more wiring in order to live up to his advertising.

Still another use will be in selling additional wiring to house owners. With such a classification the man with an average of two outlets per room should be sold the idea that an adequately wired house with more outlets will add to his comfort.

The committee hopes that the foregoing classifications will be fully discussed by architects and others interested in the subject of adequate wiring, believing that great changes in this important item are pending.

Another report of the sub-committee considers the effect of diversity in the use of appliances and the lighting load.

The following recommendations regarding room demands and number of circuits required are presented. Obviously there must be a maximum limit as to the size of house to which any empirical rule, such as the one here suggested, would apply. With this clearly in mind it is suggested that three circuits be limited to residences of not more than 2500 sq. ft. floor area, and that in all cases engineering principles should be applied, taking into account length of circuit, permissible drop in voltage, etc., in determining the size of wire to use. It should be borne in mind that any general rule is subject to variation, depending on local conditions.

The 1500 watt circuit is suggested in view of the possibility of using 15 ampere fuses.

The schedule under "Room Demands" is an attempt to arrive at the demand in the different rooms, allowing for diversity between appliances and light loads.

This recommendation does not contemplate the use of heavy current consuming devices, such as ranges, electrically heated mangles, water heaters, etc., for which special provision must be made when their use is contemplated.

| *Suggested Circuit Arrangement* | *Room Demands* |
|---|---|
| One 1000 watt or 1500 watt circuit to supply—<br>Laundry and Basement<br>Living Room baseboard outlets<br>Dining Room baseboard outlets<br>Kitchen baseboard outlets | (a) Laundry<br>750 watts plus 1 watt per sq. ft. floor area and not less than 1000 watts. |
| One 1000 watt or 1500 watt circuit to supply—<br>Ceiling outlets in main floor rooms<br>Ceiling outlets in halls and porches<br>Baseboard outlets in 2nd floor rooms | (b) Living Room<br>500 watts plus 1 watt per sq. ft. floor area and not less than 750 watts. |

| | |
|---|---|
| One 1000 watt or 1500 watt circuit to supply— | (c) Kitchen and Dining Room (loads combined) 1000 watts plus 1 watt per sq. ft. floor area and not less than 1500 watts. |
| Ceiling outlets 2nd floor rooms | (d) Bed Rooms and Bath Rooms (loads combined) 660 watts plus 1 watt per sq. ft. and not less than 600 watts plus 150 watts per room. |
| Attic lights | (e) Attic and general basement. ½ watt per sq. ft. floor area. |
| Second floor halls and porches | (f) Halls. 2 watts per sq. ft. floor area. |

The above are without regard to the number of outlets per circuit.

Outlets should be installed with reference to convenience rather than a definite number per circuit.

### Fire Protection Meeting

THE twenty-sixth annual meeting of the National Fire Protection Association is to be held at Chalfonte-Haddon Hall, Atlantic City, May 9, 10, 11. Interest already manifested indicates an exceptionally large attendance this year, and the large increase in fire losses during the past three years, generally attributed to the "moral hazard" of business depression, makes the work of the Association a matter of increasing public interest.

A considerable number of committees will submit important revisions of standards this year to keep step with changes in industrial processes. The regulations adopted by the Association, which were at first of interest to underwriters only and valuable to them in estimating hazards in the making of rates, are now commonly used as a guide by municipal and state bodies having jurisdiction over the matters with which the regulations deal.

An official program of the May meeting, giving the nature of the committee reports and other matters to be discussed will be mailed to the five thousand members some time in April. Being an educational body the Association is liberal in furnishing copies of its committee reports and other information respecting its work to anybody manifesting an interest. The Executive Office is at 87 Milk Street, Boston, Mass.

### The Lighting Fixture is a Luminaire

THE Illuminating Engineering Society announces that at the Council meeting in March, formal approval was given to the use of the word "luminaire," to designate all lighting fixtures.

This action of the Council follows the recommendation of the Committee on Nomenclature and Standards in the report presented to the annual convention of the Society at Rochester last September. An expression of opinion favorable to the adoption of the word has been received from a number of organizations. It will hereafter be employed by all illuminating engineers and salesmen of lighting service.

The word adopted is already in use in the French language in this connection and it can as readily be assimilated as the words "garage," "hangar," "chauffeur," "chassis," etc., each having displaced awkward locutions. For a long time it has been felt that "lighting unit" is clumsy and makes for confusion, the popular idea of "unit" being that it is a synonym of "standard." The introduction of new types of plugs brought in the expression "removable fixtures" and portable lamps have been termed "movable fixtures," in spite of the fact that "fixture" indicates something stationary or fixed. Luminaire will cover all these cases.

### American Engineering Standards

IMPORTANT developments that have taken place in the movement to nationalize engineering and industrial standards are set forth in detail in the report now being issued relating to the work of the American Engineering Standards Committee during 1921.

The activities of the American Engineering Standards Committee have developed to such an extent that work is now under way on 79 distinct projects which have reached an official status. In its work, 160 bodies of national importance are co-operating, these having designated more than 500 individuals as official representatives to serve on sectional committees working under the auspices of the Committee.

A statement has been issued entitled "Work of the American Engineering Standards Committee, 1921" and copies may be obtained from the secretary, 29 West Thirty-ninth Street, New York City.

# THE AMERICAN SPECIFICATION INSTITUTE

127 North Dearborn Street, Chicago, Ill.



The American Architect and The Architectural Review *has gratuitously set apart this section for use by The American Specification Institute.*

*The Editors and Publishers assume no responsibility for any statements made, or opinions expressed.*

*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review

SPECIFICATIONS may be divided into four classes insofar as their contents are concerned. These classes are materials, methods, construction and equipment. Many specifications and, in fact, most specifications that are used in building and engineering structures, combine three of these four elements; that is to say, for building and engineering structures the specifications will embrace materials, methods and construction while for the equipment there will be these same elements with a sub-element of installation after shop construction.

Specifications are essential to the proper and orderly conduct of the business of all those concerned with buildings, engineering structures of all classes and for all manner of equipment of whatever kind which may be placed in or about such works. We have, then, the following classification of users of specifications: Engineers, architects, contractors, manufacturers, vendors, labor, owners, buyers, operators.

Each one of these classes is vitally interested in having at his disposal good specifications, the intent and purpose of which cannot be questioned. To each of them a good specification brings the assurance that there will be smooth operation and cordial relations for all concerned, whereas mediocre specifications mean everything but cordiality and happiness.

Owing to a present lack of means for collecting and distributing information concerning specifications there is a needless duplication of study, research and labor on the part of specification writers. This condition tends to make the work seem arduous, as it is quite often, if there has been no effort expended towards meeting the conditions present in the individual office. Those specification writers who have had sufficient vision to analyze the problems that they must meet and who have attempted to organize their work in some more or less methodical fashion, have been gratified to find the time so spent has been well spent.

Practically all other professions are so organized that the interchange of knowledge peculiar to their profession, such as the deliberations of committees which formulate proposed standards for basic operations and the results of researches undertaken by scientific laboratories, is affected in such a way as to result in the improvement of the quality of specifications produced and as a direct consequence, has resulted in an improvement in the professional and business standing of their authors.

The American Specification Institute has been organized to improve all those conditions surrounding the writing of specifications and to bring to specification writers the benefits that are to be obtained from organized efforts of men accustomed to study and write these essential documents.

The activities of the Institute are divided into two major classes, viz.: (a) study of materials and methods and (b) study of the elements and the composition of specifications. It is highly desirable that one who writes specifications should know something of the production of raw materials and the method of finishing and preparing them for use. Such knowledge is informative and possession of it undoubtedly will tend towards a more intelligent selection and use of materials, thus producing more economical construction. The Institute does not propose to undertake the study of raw materials—such as those that enter into the manufacture of steel, for instance—with a view to developing a specification for the manufacture of any certain basic product, but it feels that a knowledge of the physical and chemical properties is, in many cases, quite desirable in order to prevent useless or wasteful attempts to utilize a material that is unsuited or uneconomical for the purpose intended.

The restrictions placed on membership, namely, that each candidate must be engaged, to some degree, in specification work for building and engineering structures assures a membership with a single purpose—the study of improvement of specifications—and precludes the giving of attention to extraneous matters that might occur if the interests of the members were of a diverse character.

The membership fee is ten dollars and the annual dues twenty dollars, payable semi-annually, the fiscal year being from May 1 to April 30.

**The Town Hall, Rheims**

*(Reproduced from a Photograph by R. M. Blackall)*

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TOWER OF S. GOTHARD, MILAN

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, MAY 10, 1922 NUMBER 2393

View of Main Entrance, Showing Covered Automobile Entrance

# THE NEBRASKA STATE CAPITOL

BERTRAM G. GOODHUE, Architect

GROUND was broken during April for the new capitol for the state of Nebraska. Five millions have been appropriated for its erection. Contracts will be let during the summer, in time to insure the completion of this work before the close of 1925. The site is in the original ten acre square which was selected for the purpose when the capitol was erected on the prairie "at a city to be called Lincoln."

The Nebraska capitol marks a radical departure in American state house architecture. The plan was secured through a series of competitions given under the auspices of the American Institute of Architects. Three Nebraska men were selected in a preliminary competition in which the economic and political aspects of the problem were considered as well as architectural requirements. Seven firms of national reputation outside of Nebraska joined in the competition, which resulted in June, 1920, in the selection of Bertram G. Goodhue of New York as the architect of the commission.

For a year after the adoption of the Goodhue plan it was studied and restudied, not only by the architect and his staff but by the commission and by the public. Some changes have been made but the essence of the first design remains in all its original simplicity and dignity, promising a public building of unusual strength and beauty as well as economy of space and low operating costs.

The capitol consists of a building approximately 440 feet square. It will have a basement below the grade, a first floor forming a terrace entirely around the building, and a main floor bringing the parapet to a height of 51 feet from the ground level. The chief feature of the structure is a tower rising from the center to a height of 400 feet. This tower, surmounted by a colossal figure called "The Sower," will be seen, it is estimated, from thirty to forty miles from every direction. The tower will be 80 feet square at the base and will taper only slightly as it rises, a square, severe shaft, pierced on each of its four sides by long continuous windows and terminating in a graceful dome of colored or gilt tile. The object of the architect in making this feature was to furnish the comparatively flat state of Nebraska with an elevated building which could be at once an object of beauty and a source of inspiration.

But while this architectural feature will distinguish the building and make it different from

Main Front of the Building from Fifteenth Street

The archway is 25 ft. wide by 50 ft. high. Above the doorway is a panel in high relief symbolizing the coming of the pioneers. Above this panel is one of the three semi-circular and grilled windows that admit light to the vestibule. On either side this arch is buttressed by pylons on the two outermost of which are two low relief panels, one of the arms of the United States and the other the arms of the State of Nebraska, while the two inner ones terminate in majestic engaged figures of tremendous scale, representing the four attributes of the law, as named in the inscription in the center and above the whole

"Wisdom, Justice, Power, Mercy
Constant Guardians of the Law."

all other capitols, it is also utilitarian to the very top. The lower portion of the tower will contain the main rotunda. Above the roof it will carry a dozen floors of offices, housing many of the state departments and providing room for an indefinite expansion of the storage space for the state library. At the top, underneath the dome, will be located the war trophy room. This will be a magnificent apartment with space to store in permanent safety the battle flags and other relics left over from the

Looking Along the South Front from the Terrace

This terrace is 20 ft. wide and extends completely around the building, giving access to the second or main floor. Within the central mass is the Supreme Court Room and on the floor above the reading room of the Law Library. The three-quarter length figures that occur between the windows and at the corners of the pylons represent the following outstanding law-givers: Minos, Hammurabi, Moses, Amenophis, Solon, Solomon, Cæsar, Justinian, Charlemagne, Napoleon

Civil War, the Spanish and Philippine wars and the recent conflict.

The tower, a strictly utilitarian feature, is the most striking feature of the Goodhue plan, but is by no means its only excellence. The basement and first floor will house the service features and many of the state departments. The chambers which distinguish such a building will be found on the main floor. Entering from the north by a broad flight of stairs, the visitor finds himself in the hall of state, a vaulted apartment approximately fifty feet high, and containing niches for statues and spaces for inscriptions and mural paintings. At the left will be a series of rooms for the governor. Passing directly to the center of the building and standing in the rotunda the visitor will have at his right a well designed senate chamber and at his left a somewhat larger apartment for the house of representatives. In front he will see the doors leading to the supreme court rooms with the state library immediately above.

The Nebraska State Capitol Building

Bertram G. Goodhue, Architect

The building is in the form of an exact square of which each face is 437 ft. long including the terraces. The greater part of the exterior is low (two stories and attic, with basement underneath) broken at the center of each side by a somewhat higher mass, each of which is the termination of a cross-shaped structure from the center of which raises a great tower, 80 ft. square and 400 ft. high from the ground to the top of the figure on the dome

Four courts opening to the sky admit light and air to the interior. The arrangement is such that every office in the structure opens either upon the outside or upon one of these courts. The library and the chambers of legislation are lighted by clerestory windows. Even the rotunda, which in practically all capitols must be illuminated, artificially, receives direct light from the windows cut into the tower as it emerges from the roof. The feature of the design is that it covers so much ground and has so large a capacity without requiring artificial lighting in any of the departments.

Governor's Reception Room

The style of architecture employed is simple and dignified. It departs from tradition but does not become futuristic. Nothing is employed, in fact, but well established forms. Simplicity is the keynote. Such criticism as has been offered deals with the severity of the lines. Mr. Goodhue has been bold and original but has not adopted a feature that smacks of the fantastic or the experimental. What he has done is to take the American skyscraper and with unexampled boldness and courage has fitted it into a pub-

Foyer

This Great Hall leads from the vestibule directly to the central rotunda beneath the tower. Its ceiling is a groined vault of colored and gilt tile of which the apex is 50 ft. from the floor, the room itself being 80 ft. long by 30 ft. wide. On the walls beneath the semi-circular windows of the clerestory are six panels for mural paintings relating to the history of Nebraska. The piers supporting the vault are of marble. This hall is separated from the central rotunda by a screen, providing on the floor above, a convenient means of passage between the Chambers of the House and the Senate

The Library

Though its floor is set a story above, the room balances the Foyer. It is divided by arches into four bays, each bay vaulted with a pendentive dome. Between the projecting bookstacks that carry the balcony are a series of alcoves, each with its own window. The doorway at the end of the picture leads into the reading room which, it is expected, will be used mainly by the judges. Although in this and the reading room, space is provided for sixty thousand volumes, the shaft of the tower will provide for present storage and expansion in the future for many years to come

One of the Interior Courtyards and a Corner of the Tower

Each of these courts is a rectangle, 87 ft. x 100 ft. They are open to the sky

**Senate Chamber**

The walls are of stone, though it is proposed to introduce in panel form and also in the ceiling a different material of high absorbent power for the sake of its acoustic effect. As elsewhere the ceiling, which takes the form of a pendentive dome, is decorated with gold and colored tile. Beneath the galleries that extend around the entire room is a passage separated from the Senate Chamber proper by screens on three sides and with marble columns on fourth, behind the speaker's desk and platform

**House of Representatives**

Though on the plan this Chamber is of precisely the same dimensions as that of the Senate, owing to the necessarily larger seating capacity required, a somewhat different treatment has been used. The galleries, in this case on three sides only, are supported by pairs of marble columns. The Speaker's desk is placed in a niche on the west wall beneath a mural painting, the subject of which has not yet been determined lic building in a way to give striking architectural results and at the same time provide convenience, utility and economy to an unexampled degree.

The material is to be of stone of a rather light buff tone. No engineering problems of any difficulty have been encountered. Thirty feet below the surface a bed of Dakota sandstone is encountered. Piers at intervals of sixteen feet will be sent down through the clay and sand formation to this rock and no danger of settling need be felt even under the great tower, which is the only portion that puts unusual stresses upon the foundation walls. The tower itself will be of steel construction with wind bracing to give it security.

The building will be enriched by sculpture painting and vaulting of colored and gilt tile. The figures over the main entrance, representing Wisdom, Justice, Power and Mercy have already been modeled by Lee Lawrie, to whose hands has been entrusted all the sculpture for the completed building. Inscriptions drawn from the great storehouse of the world's wisdom will be carved on the walls. Space will be left for mural paintings but these will not be included in the present work of the commission. The law calls for the erection of the building for five millions of dollars without furnishing or without the purchase of additional ground. The new capitol is to stand on the site of the old one. It will be the third state house to be erected on the grounds since Lincoln was made the capitol when the state entered the union in 1867.

Main Entrance

Leading up from 15th Street to the entrance is a monumental flight of steps, 75 ft. wide, terminated by plinths upon which sculptured in low relief, are buffaloes and appropriate inscriptions

# THE SESQUI-CENTENNIAL EXPOSITION IN PHILADELPHIA

BY CARL A. ZIEGLER, A. I. A.

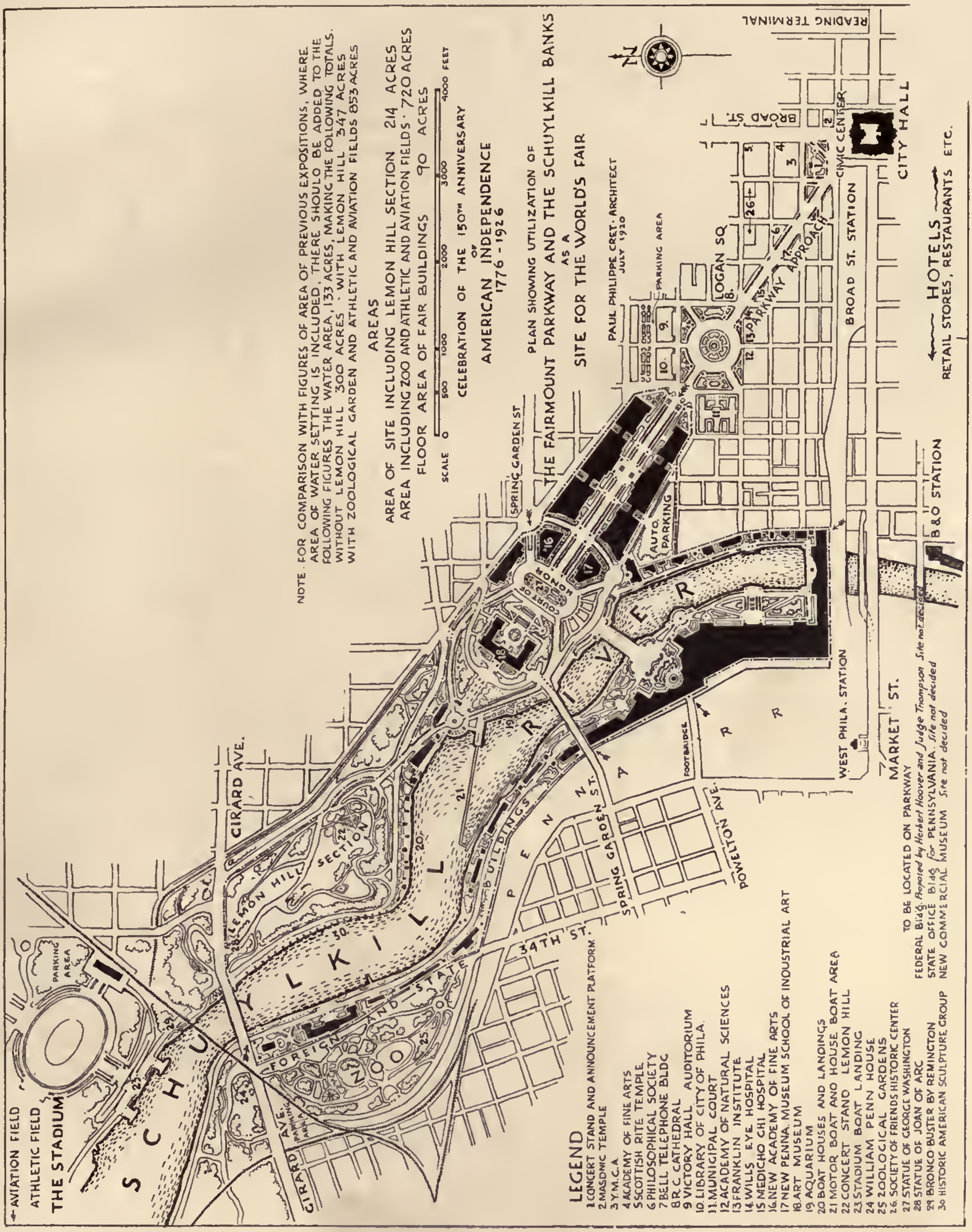
NOW that Philadelphia has definitely decided upon a site for the Sesqui-Centennial Exposition to be held in that city during the year 1926, to commemorate the 150th anniversary of the signing of the Declaration of Independence, the question naturally arises as to what form that great project is to take.

Artists who have followed for the past ten years the development of the great Parkway which cuts diagonally across the city from the City Hall in the center of the business district, to Fairmount Park in the Northwest, realize that Philadelphia has had for some years a vision of creating what is destined to become the Acropolis of Art in America. In addition to this great boulevard, second to none in the world for the boldness and beauty of its conception, Philadelphia has also been studying for a number of years the possibilities of developing the banks of the Schuylkill River along the lines of the Thames Embankment in London and the Seine in Paris.

The eminent French architect, Dr. Paul P. Cret, under whose guidance the School of Architecture at the University of Pennsylvania has been developed until it ranks second only to the Ecole des Beaux Arts of Paris, was retained some years ago to study the development of the Schuylkill River banks where it passes through the city and when the subject of the Sesqui-Centennial was first broached in 1918, he was asked to suggest a plan whereby the Parkway and a portion of the projected Schuylkill Embankment might be used as a nucleus around which to build the coming Exposition.

By the happy association of these two great projects it was hoped to gain for the Exposition an incentive that would not only add greatly to the artistic conception of the Fair, but would also give


Partial Plan of City of Philadelphia, Showing Its New Civic Center and the Connections of the Fairmount Parkway with the Present Street System and Other Proposed Radial Avenues

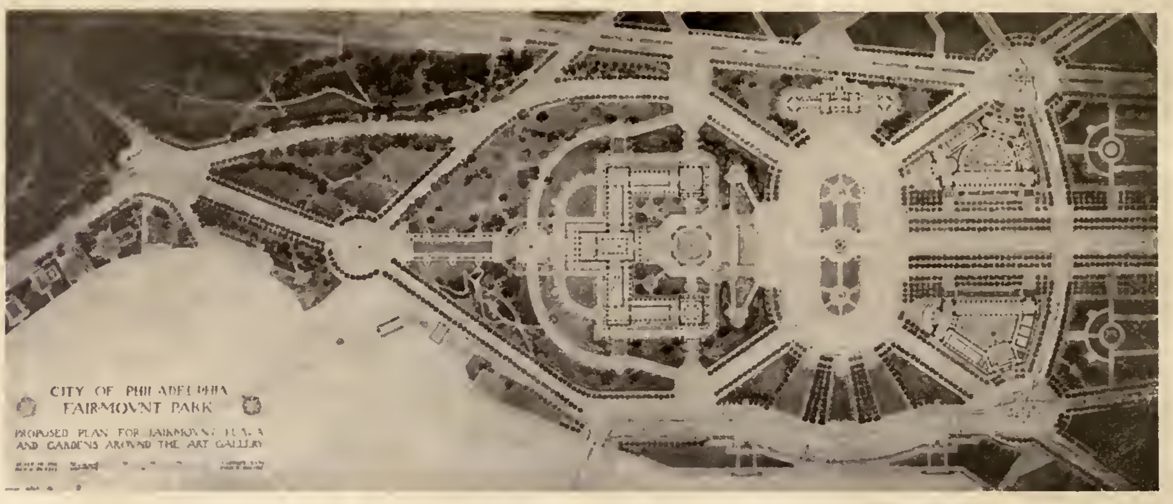



Paul Philippe Cret, Architect

to Philadelphia an inspiration to rush to completion the long cherished Parkway and the River Embankment.

How well Dr. Cret succeeded in combining these three projects can be seen by studying the accompanying plan, which although only a preliminary study and not sufficiently developed to show individual buildings, is worked out in ample detail to afford a comprehensive idea of the great possibilities of the site.

Such a site, the entrance to which is only a few squares from the heart of the City and the Railroad Terminals, is unique and with a river of the width of the Schuylkill to play with, the artists who plan its embellishments must needs be supermen to produce architectural structures worthy of the setting.




Proposed Plan for Fairmount Plaza and Gardens Around the Art Gallery

Strange as it may seem Philadelphia has taken more than a year to decide upon this site, but so keen has been the interest in the Fair that every large public organization has asked to be heard and many sites have been offered for consideration, but that a wise choice was finally made is now the unanimous opinion.

The area, including the Zoological Garden and the water area, is 853 acres. It is estimated that the Fair will cost between Thirty and Forty Millions of Dollars, but unlike most expositions, a large portion of the work will become permanent and will be utilized in the completion of the Parkway and River Embankment.

At the Southwest corner of the tract, along the West bank of the river there now exists an abattoir surrounded by a plot of ground that is a veritable "no man's land" and which must have been overlooked by the early city planners. According to Dr. Cret's plan this wilderness will "blossom like the rose" and as a new bridge is to be built to carry the buildings entirely across the river at this point in order to screen the very unpicturesque bridges directly to the South, we may expect this unattractive spot to become one of the particularly attractive portions of the Fair.

Philadelphia is to be congratulated upon having made a wise choice; that which was done in Independence Hall in 1776 has led many pilgrims to her shrine; that which she will consummate in 1926 is, in term of city planning, quite as radical a step and will no doubt become as famous in the Art World as is the "Cradle of American Liberty" in the Political World, for no city in America has dared to wipe out such a large area from the very center of her business section in order to follow deliberately through many years a vision worthy of the Golden Age.

Only a physical examination of the great Parkway already opened for traffic can give an adequate conception of what has been achieved and now that there has been added to this achievement the determination to complete the Schuylkill River Embankment and the Exposition, the art student may confidently anticipate the dawning of a new epoch in American Art in 1926.

The chief characteristics of the design for the architectural treatment of the Parkway have already been decided upon and the splendid Art Museum at Fairmount with the Court of Honor below it may properly be referred to as "America's Acropolis of Art." Already the Art World is asking pertinent questions in reference to the design of the Exposition itself. Will it follow the purely classical lines of the World's Fair at Chicago, a selection which exerted a tremendous influence on American Art, or should we have the freedom granted the designers of the Paris Fair? Will it be colorful like the Pan-American Fair at Buffalo and are we to have conceptions like Louis Mullgardt's at San Francisco? Will the *"Arts*

*Noveau"* run riot in the Midway or will the Volstead Act restrain that feature?

A London critic reviewing the recent American Architectural Exhibition in that City stated that only one of the buildings was "American" in design and that the Blenheim Hotel at Atlantic City. What a pity that Mr. Magonigle's War Memorial for Kansas City was not a part of that exhibition, in order to illustrate that the American architect is capable of wandering beyond the limits of stylistic traditions without losing dignity.

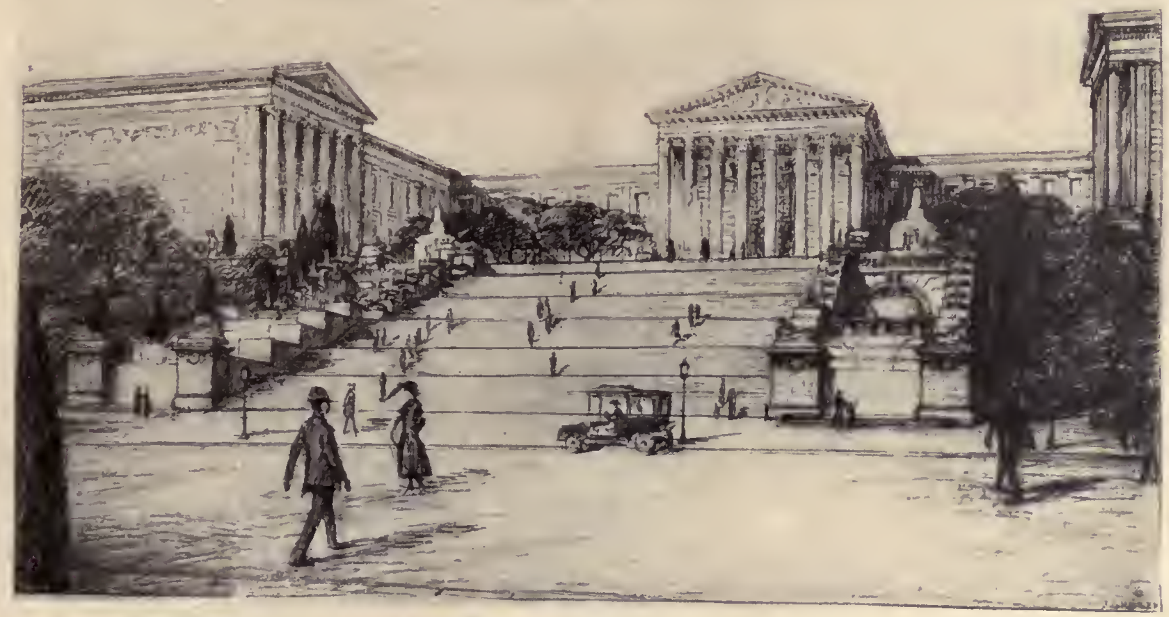
No one should quarrel with the desire of the super-modernist to effervesce in the Midway Pleasance, for is not frivolity the essence of the side show, but if a World's Exposition has one purpose that is paramount, it is the creation of a vision that is irresistible and must influence the minds of all who come in contact with it regardless of whether they are classed as the "Intellegenzia" or the "Proletariate."

Only this achievement can possibly justify such a large expenditure of effort and money. Commercial success will not compensate for the lack of vision. The Merchant Princes of Venice have long since been forgotten, but Venice still charms the world.

There is a peculiar psychology about the effect which materials have on the minds of the architectural designer, designing a cornice in galvanized iron as compared with marble for instance.

Most World Fairs are executed in "staff" destined when the last strains of the music have faded and the lights have been extinguished for the last time, to the limbo of forgotten things; but in Philadelphia it is the purpose to salvage a large part of the Exposition for a permanent improvement to the city and this fact must influence the imagination of the designers, else might we find the fair Quaker City permanently arrayed in the ornaments of the frivolous "Flapper."

But four years remain in which to complete the entire project, a time all too short for so stupendous a program and wise must be the executives who are to guide its fortunes if the Exposition is to be a worthy tribute to the arts and crafts of America.



Perspective of the Main Entrance Steps to the Museum

Paul Philippe Cret, Architect

VIEW INTO PATIO

HOUSE OF E. M. GOULD, ESQ., MONTECITO, CAL.

ENTRANCE GATES

HOUSE OF W. S. MORSE, ESQ., PASADENA, CAL.

REGINALD D. JOHNSON, ARCHITECT

# ·EDITORIAL·COMMENT·

THE MAY 24 ISSUE of THE AMERICAN ARCHITECT will be one of unusual interest and large technical value.

The leading article, by Lionel Moses, entitled "McKim, Mead & White—A History" will review the work in architecture of the present generation of members of a firm that is one of the architectural landmarks of the United States. This article will be profusely illustrated by examples of the larger work of McKim, Mead & White, designed and executed since 1910.

A further important feature of the May 24 issue will be the beginnings of two series:—

The first, by Professor Paul E. Sabine, will treat on the Nature and Reduction of Office Noises. Professor Sabine is probably the highest authority in this country on the subject of acoustics. His article describes and analyzes all the many distracting sounds that are to be found in large offices, due to typewriter operation as well as other mechanical devices used. The remedies are set forth and clearly explained.

The series by Joseph G. Reynolds, Jr., Master Craftsman in stained and painted glass, begun in this issue will take up and consider the technical study of stained glass in all its artistic and commercial phases.

* * *

AN INNOVATION IN EXHIBITS of art was proposed by The National Sculpture Society when it stated its willingness to hold its annual exhibition in the open in the form of a sculpture garden in Central Park, in this city.

In view of the very large educational value of an important exhibition of the art of sculpture under such very dignified auspices, it is difficult to understand the objections raised by various societies. Protests have been made by the Parks and Playground Association, the New York Chapter of The American Society of Landscape Architects and other societies ostensibly interested in the preservation of the parks.

It is gratifying to note that The Architectural League of New York warmly endorsed this out-of-doors exhibition of sculpture, and that it has in a series of resolutions formally expressed its regrets that the objecting societies were not able to consider with more favor the request of The National Sculpture Society. The resolution passed by the League further expresses in its wording, the opinion that the proposed exhibition would lead to the establishment of a permanent sculpture garden to be maintained by the Metropolitan Museum. It cites as precedent characteristics of the appreciation of art by state and municipal authorities abroad, tending towards the embellishment of parks and the education of the public's tastes, the many sculpture gardens maintained in connection with the prominent museums of Europe.

THE AMERICAN ARCHITECT is on record as to its attitude towards any encroachment on our present park areas for purposes other than might strictly be regarded as within the usual recreative function of parks. It would seem to be just as logical for the societies who are protesting this exhibition, to protest any extension of building of the Metropolitan Museum as to take exception to an exhibition which would be so very dignified, so very educational and so very desirable towards the art education of the people as is the Metropolitan Museum itself.

In previous years amongst the most dignified exhibitions of art that were held in this country have been those of The National Sculpture Society. Its membership numbers the leading sculptors of the United States, whose work stands far away at the head of the art of sculpture of the world. These exhibitions held more often in connection with the exhibitions of The National Academy or The Architectural League, have not, by reason of the limitation of area available, been able to present the wonderful development of the sculptor's art in America in a manner that is due it.

Further, the rather aristocratic surroundings of the various exhibitions of art held in this country by art societies have a tendency to repel the great mass of the people who are the ones that should really have opportunities for art education. An exhibition of sculpture in the open in Central Park would attract hundreds of thousands of visitors and would do more to acquaint the people with the wonderful artistic development of sculpture in the United States than any exhibition that might be held indoors.

The protesting societies should re-consider this matter in all its various aspects. If the best counsels are brought to bear and the exhibition encouraged as it should be, The National Sculpture Society would undoubtedly place on exhibition in Central Park a collection of sculpture that would mark an epoch in the art history of this country.

* * *

SINCE THE FOREGOING was written, The National Sculpture Society has withdrawn its application for the proposed space for an exhibition in Central Park. A. A. Weinman, the chairman of the exhibition committee, stated in his letter to Park Commissioner Gallatin that in view of the objections that had been raised the Society had decided to abandon the project. Commissioner Gallatin in his reply, indicated that he would consider the advisability of a plan whereby the City would acquire property for a formal garden where public art exhibitions could be given.

If the proposed exhibition could have been held, Mr. Gallatin would have little, if any, difficulty in securing official sanction to the plan he proposes.

No feature of art in this country is as little understood by the masses as that of sculpture. We hope The National Sculpture Society will not abandon an out-of-doors exhibition. It could, and undoubtedly would, prepare a grouping of sculpture that would delight and instruct thousands of people. An opportunity to forward one of the most dignified educational undertakings is undoubtedly only lacking of official co-operation. There are other available sites. The National Sculpture Society could, if properly encouraged, arrange an exhibition on some selected section of Riverside Drive that would become a Mecca to all the people. Perhaps art has as much right there as railroad tracks, coal pockets and flaunting bill boards.

* * *

CENTRAL PARK HAS NOW LOST most of its one-time natural charm. The impoverishment of the soil has retarded growth of forest trees, and the vandal elements in a city population have over-run and destroyed much of the natural effect of that fine area.

It is, of course, perfectly right to preserve the park from encroachment, but it seems inconsistent to permit the slow destruction that is the result of a careless, thoughtless lot of people. Eventually, owing to a shifting of population, Central Park will be too far from the classes of people who most need to avail of it. Even now it is surrounded on all sides by the most stately residences and high rental apartments in this city. During summer months most of these dwellings are closed and those who avail of the park come long distances from the congested locations of the East Side.

A group of citizens, headed by George Grey Barnard, the sculptor, has suggested that the large and undeveloped section along the southern banks of Spuyten Duyvil Creek, and running from 189th to 203rd Streets, be saved from so-called improvement and be converted into an acropolis and recreation area. Few cities possess so attractive a locality. Since the days when Hendrik Hudson voyaged on the river which bears his name, this spot has remained untouched. Few of the dwellers on Manhattan Island know of its beauty. Those who do, find recreation and rest on those wooded slopes under the shade of trees of forest growth. Efforts have been made to save this tract from the hands of the real estate speculator, and an option was secured on its purchase. But it seems impossible to impress the city authorities with a sense of the importance of this tract or to find citizens of sufficient public spirit to contribute to its purchase.

There, would be provided a place for an out-of-doors exhibition of sculpture, with an unsurpassed setting. If one could be arranged, the hundreds of thousands who would visit it would become so impressed with the absolute necessity for the conservation of this wonderful site that it would be a hardened politician or a more than indifferent "realtor" who would set his sordid views against the will of the citizens.

Here is a park site, exactly on Manhattan Island on a location that would not be surpassed by any city in this country.

The National Sculpture Society, with the strong backing it undoubtedly could secure, could start a movement that would earn it the gratitude of every one in Greater New York.

* * *

C. B. J. SNYDER, for thirty-one years Superintendent of School Buildings in New York City, has applied for retirement. Dr. Ettinger, Superintendent of Schools, in announcing Mr. Snyder's application for retirement, referred at length to his long and faithful services and his great contribution to the advancement of school architecture in the United States. "Many features," said Dr. Ettinger, "that are now considered essentials of school building planning were originated by Mr. Snyder, while the artistic excellence of his designs have set standards everywhere."

During his term of office, Mr. Snyder has supervised the erection of more than $200,000,000 worth of school buildings. It is significant of his efficiency and close adherence to the highest principles of architectural practice, that during his incumbency, Mr. Snyder's department has been conspicuously free from all political scandal.

It is sure that every one that has at one time or another been in contact with Mr. Snyder's department will learn with regret of his proposed retirement. He may confidently believe that he has gained the respect of the entire community and that he has set a standard that will for all time be the highest mark of artistic and executive efficiency.

REFLECTION POOL

HOUSE OF J. P. JEFFERSON, ESQ., MONTECITO, CAL.

REGINALD D. JOHNSON, ARCHITECT

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POOL AND PERGOLA

HOUSE OF J. P. JEFFERSON, ESQ., MONTECITO, CAL.

REGINALD D. JOHNSON, ARCHITECT

VIEW INTO PATIO WITH BACCHANTE BY McMONNIES

HOUSE OF J. P. JEFFERSON, ESQ., MONTECITO, CAL.

REGINALD D. JOHNSON, ARCHITECT

FRONT ENTRANCE

HOUSE OF E. C. THIERS, ESQ., PASADENA, CAL.

REGINALD D. JOHNSON, ARCHITECT

HOUSE OF MRS. F. P. KNOTT, MONTECITO, CAL.

REGINALD D. JOHNSON, ARCHITECT

CORNER OF FORECOURT
HOUSE OF EDWARD LOWE, ESQ., MONTECITO, CAL.
REGINALD D. JOHNSON, ARCHITECT

3676

HOUSE OF TODD FORD, ESQ., PASADENA, CAL.

REGINALD D. JOHNSON, ARCHITECT

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DETAIL OF PRINCIPAL ENTRANCE

HOUSE OF W. S. MORSE, ESQ., PASADENA

FRONT ENTRANCE
HOUSE OF T. R. COFFIN, ESQ., PASADENA, CAL.
REGINALD D. JOHNSON, ARCHITECT

HOUSE OF E. P. GAVIT, ESQ., MONTECITO, CAL.
REGINALD D. JOHNSON, ARCHITECT

380 10

VIEW IN GARDEN

HOUSE OF EDWARD LOWE, ESQ., MONTECITO, CAL.

GARDEN STATUE BY McMONNIES

HOUSE OF J. P. JEFFERSON, ESQ., MONTECITO, CAL.

REGINALD D. JOHNSON, ARCHITECT

388"

HOUSE OF E. M. GOULD, ESQ., MONTECITO, CAL.

ENTRANCE PORCH
HOUSE OF ARTHUR K. BOURNE, ESQ., PASADENA, CAL.
REGINALD D. JOHNSON, ARCHITECT

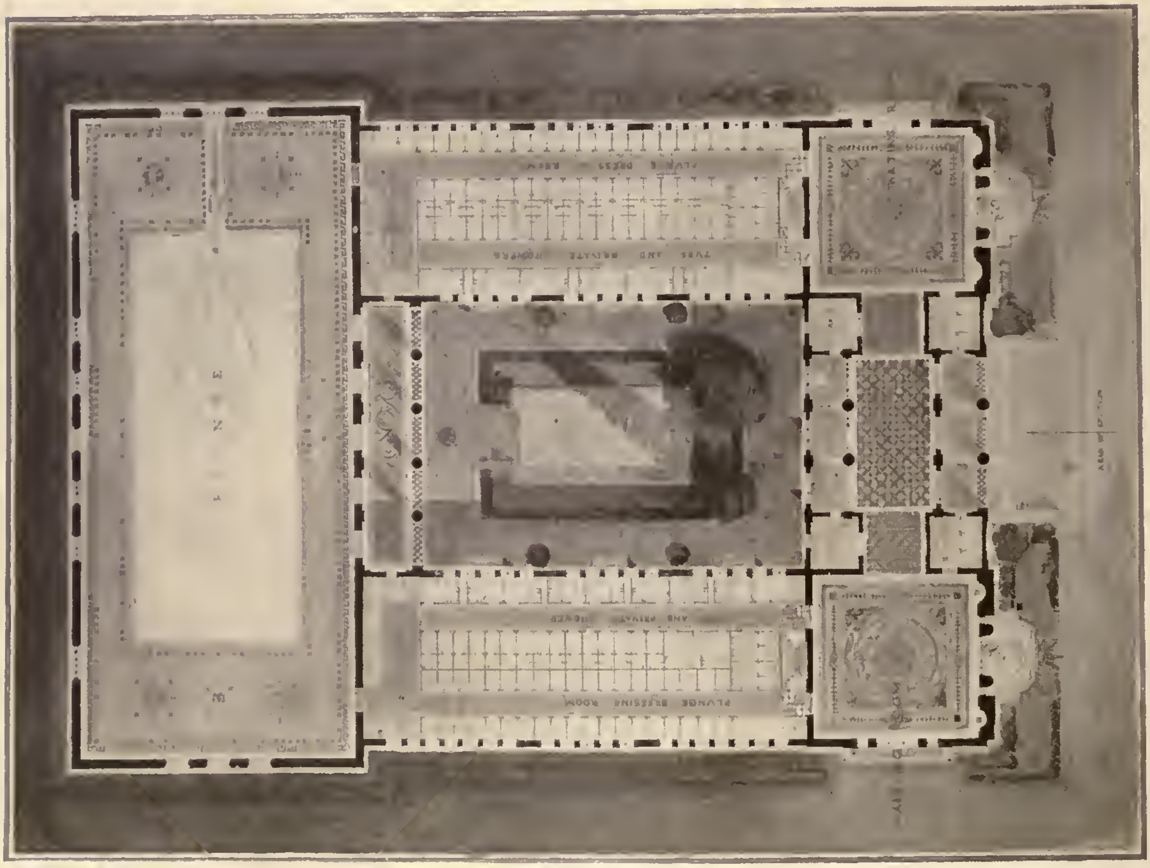
PRIZE WINNING DESIGN

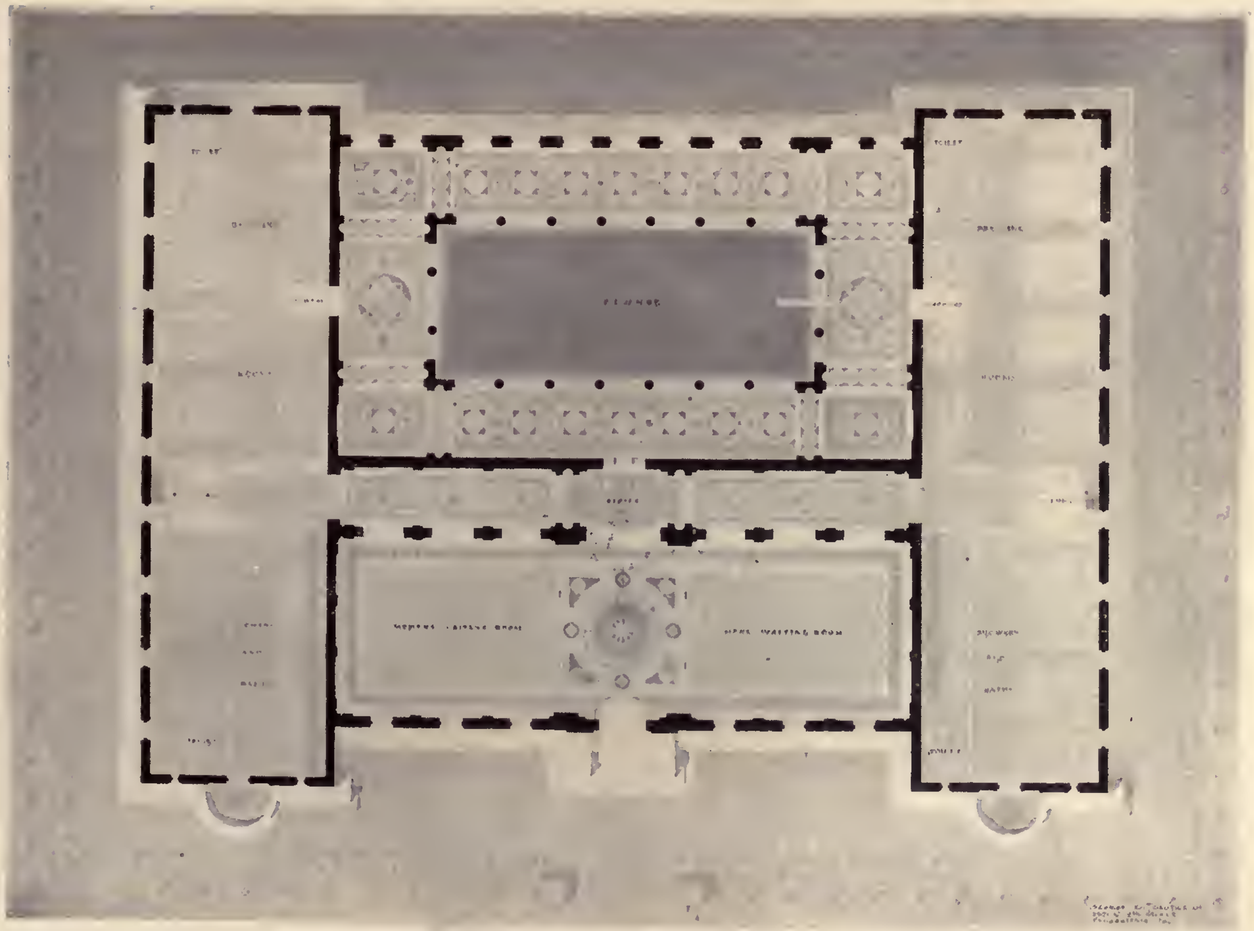
LIONEL H. PRIES

LE BRUN TRAVELING SCHOLARSHIP COMPETITION, 1922

PRIZE WINNING DESIGN — LIONEL H. PRIES

LE BRUN TRAVELING
SCHOLARSHIP COMPETITION, 1922





FIRST MENTION

GEORGE K. TRAUTWEIN

LE BRUN TRAVELING SCHOLARSHIP COMPETITION, 1922

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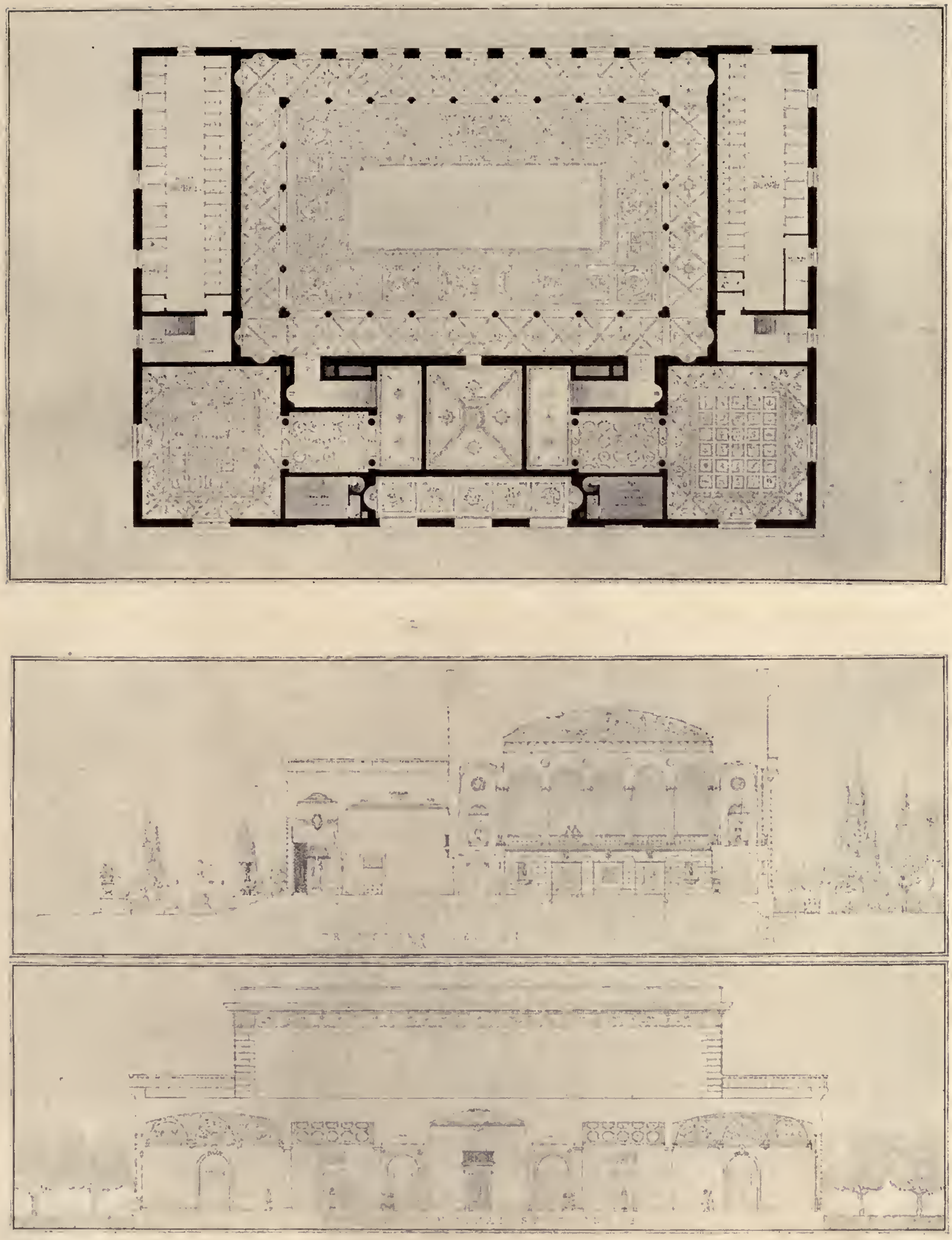
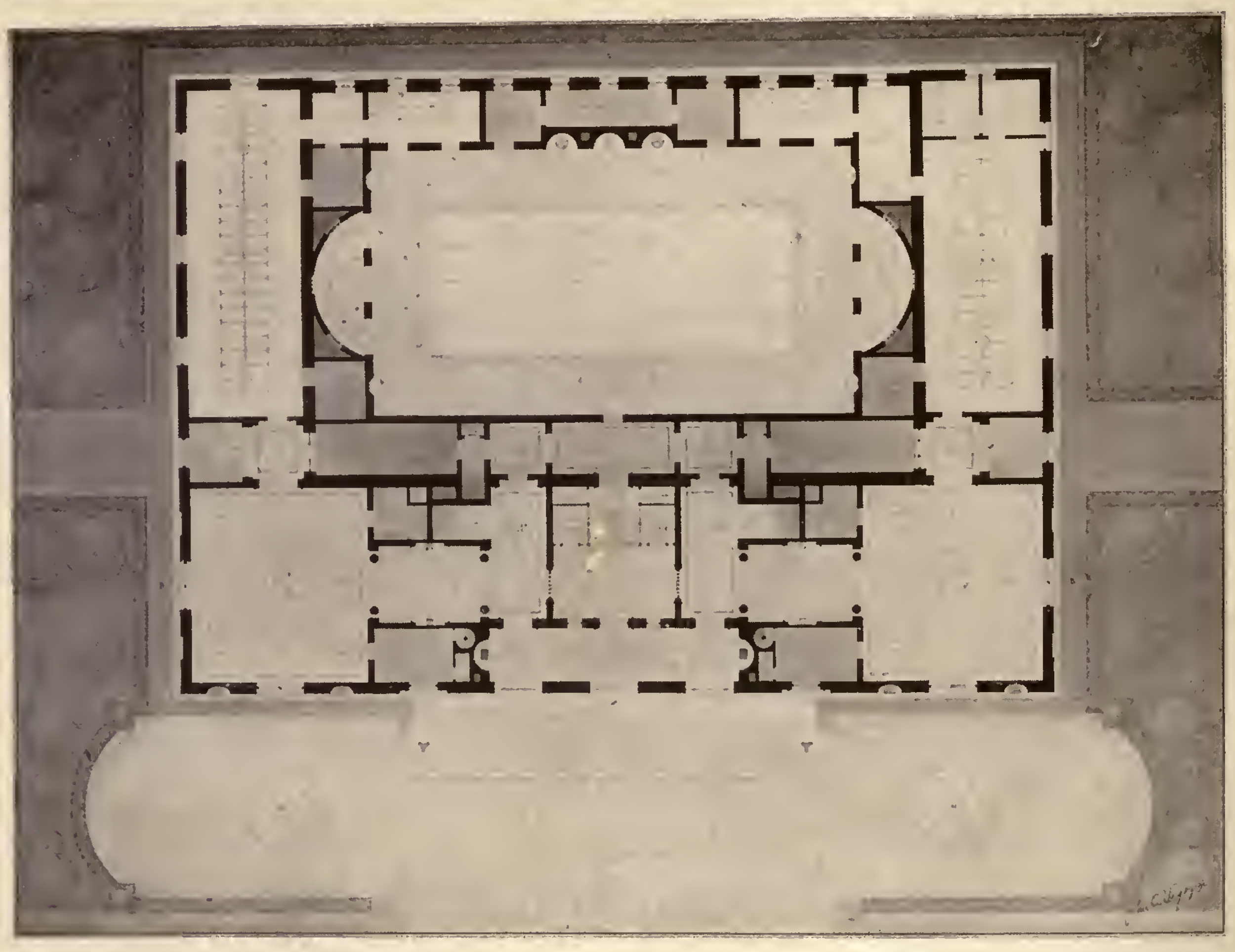


SECOND MENTION JOHN O. VEGEZZI

LE BRUN TRAVELING SCHOLARSHIP COMPETITION, 1922



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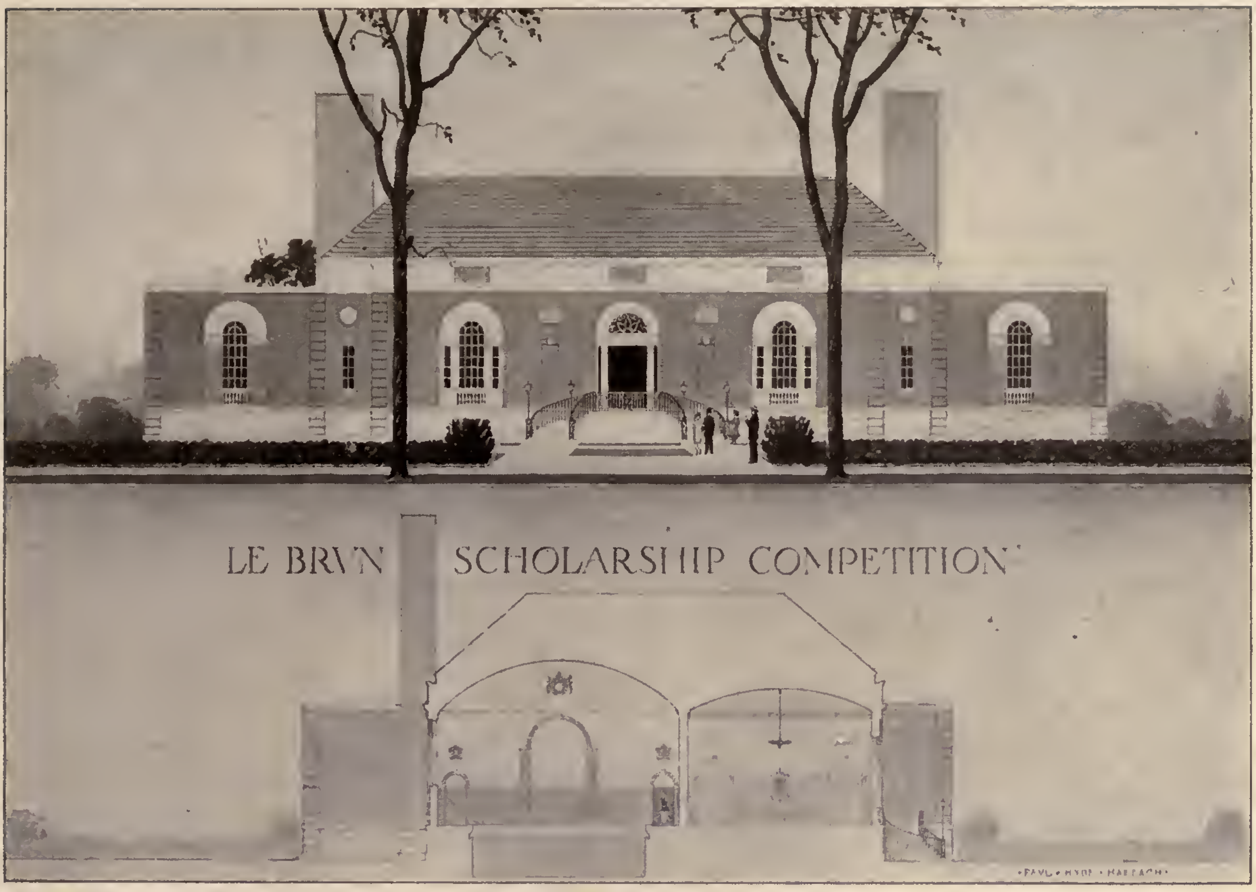
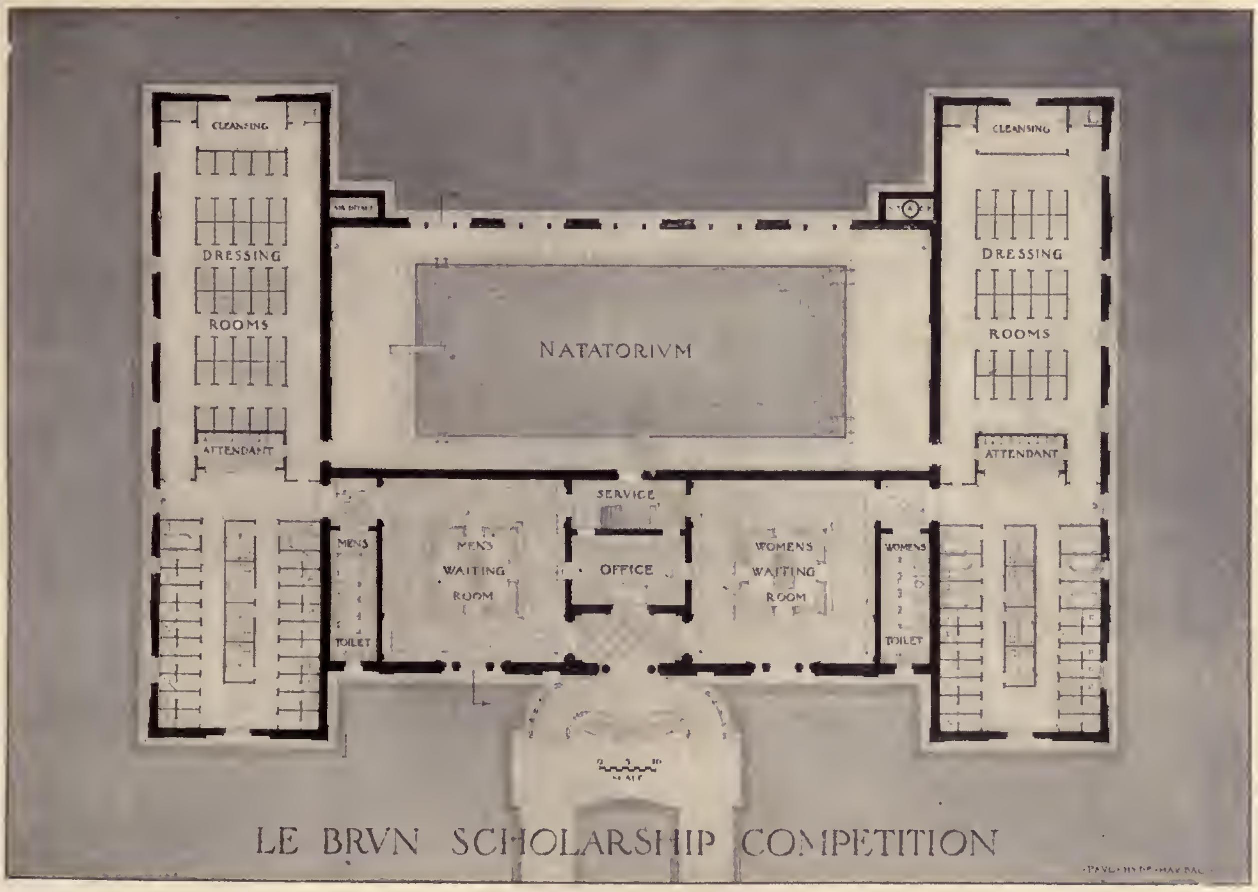



THIRD MENTION

PAUL HYDE HARBACH

LE BRUN TRAVELING SCHOLARSHIP COMPETITION, 1922

# EXTRACTS FROM COMPETITION PROGRAM, LeBRUN TRAVELING SCHOLARSHIP, 1921-1922

A PROSPEROUS city of from 100,000 to 150,000 population has voted the funds necessary for the construction of a

MUNICIPAL BATH BUILDING

It is supposed that the citizens of the city have a proper pride in the aesthetic quality of its public buildings, parks, etc., and have consequently instituted a competition for the selection of an architect to construct this building about to be added to the city's public buildings.

The size, materials, type of architecture, etc., are left entirely to each competitor who may locate, if he so wish, the city in some particular region of this country and develop his scheme and selection of materials to suit and express the climatic or other general conditions of the region.

THE SITE: The building is to be located in a public park in proximity to a main street that forms one of the boundaries of the park, and at a point where there is no grade. The building, with its approach, must be confined to a space 190 ft. x 250 ft. It is left to the option of the competitor to determine whether the long or the short axis of the property shall be parallel with the street.

THE BUILDING: Practical considerations call for the entrance, or entrances, for both men and women, to be on the façade, facing the public street, from which they have immediate access to separate waiting rooms.

While in these waiting rooms, both sexes obtain from the General Office a card of admission to the baths and they give up, for safe keeping, any valuables in their possession.

Each sex must have direct access from its waiting room to its portion of the bathing establishment. An attendant there takes up the bath ticket and distributes towels and, when required, bathing suits.

Those who merely wish to take a shower bath will find individual dress cabins in communication with individual showers. Those who wish to take tub baths, will find bath rooms with bath tubs, while those who wish to enjoy a swim in the plunge, will find dress cabins in direct communication with a Cleansing Room, for each sex, where a shower must be taken, before proceeding to the plunge. The plunge is to be used in common by both sexes.

Exit from the building must, of necessity, be through the waiting rooms.

REQUIREMENTS FOR THE BUILDING

A PLUNGE or swimming pool, 75 feet long and about 30 feet wide with a platform on all sides about two feet above water level. At the deep end of the pool the platform should allow for a running dive.

CLEANSING ROOMS, one for each sex, with totals of about 12 showers.

DRESSING CABINS (3 feet x 4 feet). Approximately 40 for men, 30 for women.

SHOWERS (3 feet x 3 feet) with individual dressing cabins (3 feet x 4 feet), 1 shower for each cabin, approximately 20 for men, 15 for women.

BATH ROOMS with individual bath tubs, about 6 for men, about 10 for women.

TOILETS AND WASH STANDS for each sex separately.

ATTENDANT'S ROOMS for towel and other supplies.

WAITING ROOMS for each sex.

GENERAL OFFICE for administration.

The general services for heating, etc., may be considered to be placed in a basement or cellar and do not form part of this program, but their existence necessitates the raising of the main floor level about 5 feet above curb.

The building may be one or more stories in height.

# LEGAL DEPARTMENT

Conducted by

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

THERE has recently been passed by the New York Legislature, and approved by the Governor, the so-called Bly bill which amends in a number of important particulars the 1915 Law referring to the registration of architects. The old law required in substance that any person residing in or having a place of business in New York State and who, before the law went into effect on April 28, 1915, had not engaged in the practice of architecture in that state under the title of architect, must before being known as an architect, secure a certificate allowing him to practice as such. The law further provided that any person who had been in practice as an architect before the above date "may" secure such certificate and that anyone having a certificate is entitled to be known as a registered architect. Under the above phraseology, it was optional with anyone who had been engaged in the practice of the profession prior to the time when the law took effect to register or not register, as he saw fit. The only difference was that, if he did register, he might then assume the title of "Registered Architect" and use the abbrevation "R. A." as indicative of the fact that a certificate of qualification had been issued to him.

The law in this respect has not been changed. This section of the law has, however, had a new paragraph added, as follows:

"Any person claiming the right to practice as architect or registered architect by reason of his or her having been in practice as such prior to the twenty-eighth day of April, nineteen hundred and fifteen, may be required by the board to file an affidavit setting forth the facts and to present such evidence as will satisfy the board that he or she was in *bona fide* practice previous to such day."

It will be noted that the above paragraph gives the Board the power to require any architect, registered or not, to submit proper proof of the fact that he was engaged in *bona fide* practice prior to the date mentioned.

The section of the old law dealing with the Board of Examiners remains substantially unchanged. The section dealing with qualifications, examinations and fees, is amended in a number of important respects, however. Among other things, an applicant in order to secure his registration without examination must show that he was in practice for two years prior to April 28, 1915, and make application for registration before January 1, 1923.

The section dealing with certificates has been enlarged. There is now provided a fee of $1.00 for the filing of the certificate of registration and the affidavit in the office of the clerk of the county in which the architect resides or has his office. It is further provided that re-registration must be made by May 1, of each year, through the Secretary of the Examining Board, and that a fee of $2.00 is to be charged for each re-registration. It is further provided that an architect who is not registered as shown by the list to be published each January 1, shall be deemed to be practicing illegally and that his certificate may be revoked, and that all architects registered at the date of the passage of the act must, before December 1, next, apply for re-registration through the Secretary of the Board.

The date of the approval by the Governor of this bill was April 5, 1922. Apparently the provisions of the law which make it permissive and not mandatory for an architect in practice prior to April 28, 1915, to register are retained. The new provisions to the effect that an architect who does not appear to be registered, as shown by the list to be published each year, shall be deemed to be practicing illegally, refer merely to those architects who have registered. The effect of the law, therefore, appears to be that if an architect does not register he is entitled to practice without registration by reason of his practice prior to April 28, 1915, and may continue to practice without registering and will not be considered to be practicing illegally because his name does not appear on the registration list. On the other hand, if an architect registers, and thereafter fails to re-register, so that his name fails to appear on any list to be published thereafter, he will thereupon be deemed to be practicing illegally and his certificate will be revoked.

There is some question in my mind whether such an architect might, nevertheless, continue thereafter to practice without registration if he had been in practice prior to April 28, 1915. The provision of the law that he would be deemed to be practicing illegally is certainly broad enough, however, to be construed as covering his practice whether he practiced as a registered architect or not and the indication is that once an architect is registered, he must thereafter be careful to re-register regularly or face the danger of having it held that he is not legally entitled to practice.

The foregoing amendment is in line with the general tendency, which I have had occasion to note before in these columns, to place the practice of the profession on a basis more analogous to that of the profession of law by requiring that all applicants, for admission to practice, shall demonstrate their fitness not alone by their preliminary training or by graduation from a recognized School of Architecture, but by their ability to meet the requirements of proper examinations, corresponding to the examinations for admission to the bar. It is a question of time only, I think, when laws of this general type will be adopted generally by the different states and placed upon a substantially uniform basis.

## LEGAL DECISIONS

PLAINTIFFS brought an action to foreclose a mechanics' lien. The lien was claimed under a contract between plaintiffs and defendant, whereby the plaintiffs agreed to erect and complete a garage and factory building. The contract called for the furnishing by the architect of certificates at the end of each month. Plaintiffs began work, but never completed the contract. They claimed that the defendant, the owner, had defaulted in making payments under the contract, but the court found that this was not the case, and that the plaintiffs abandoned the contract, without any justification for this action on the part of the owner. Thereafter, the owner took possession of the premises and proceeded with the completion of the building. The plaintiffs claimed that the defendant, in completing the work, did so at an unnecessary expense, and claimed also reimbursement for extra work. The decision of the court is voluminous, and, after practically taking an account between the parties, decides on a certain balance due the plaintiffs for extra work and for the difference between the balance of the contract price and the cost to the owner of completing the work, less a nominal award to the owner on his counterclaim. In the course of its opinion, the court, among other things, held as follows:

If an owner is in default in making payment under a building contract, the contractors are no longer bound to proceed, but are thereby relieved from their obligations under the contract and entitled to file a lien for the amount due them for work and materials.

If the contract provides that payment installments are not due until the certificate of the architect is obtained, nothing is due on such an installment, in a case where the certificate is not produced or its production is not waived by the owner.

Where the owner is given the right to retain an amount sufficient to indemnify him against claims or liens and the contractor admits that the claims or liens against the property exceed the balance due the contractor, the owner is not obligated to pay such balance to the contractor, until he is completely indemnified against such claims or liens. The requirement that the architect's certificate shall be produced to justify payment of an installment is not applicable where the owner completes on the contractor's default. Where the owner so completes, upon abandonment of the contract by the contractors, without just cause, the owner remains liable for the payment of such liens as take precedence over the lien of the contractor, in the order of their priority, provided that, after allowing for the cost of completion, sufficient of the contract price remains to take care of such liens. Where the owner completes on the default of the contractor, it is not proper to attempt to show, by expert testimony, what would be the reasonable cost for the completion of the work or the reasonable cost of completing any part thereof. This evidence is not admissible, because the question is not what the contract could be completed for, but what was actually and necessarily expended to complete the contract. The owner cannot, however, complete the work in an extravagant or reckless manner and charge the contractor for expenses unnecessarily or unreasonably incurred. It is only the reasonable value of the work necessarily done fully to complete the contract, according to the plans and specifications, which is deductable from the contract price.

Where the contract provides that claims for extra work shall be arbitrated, the right to insist on this procedure is waived, where the owner does not raise any such question in his answer and makes no objection to the admission of testimony on the trial offered by the contractor, in support of the claim for extra work. The balance found due the contractor for extra work is applicable to the payment of liens in the order of their priority.

Where a contract provides that there shall be a payment of $15.00 per day, as liquidated damages for the contractor's delay, such a provision is applicable only in a case where the contractor delays in completing the building, as distinguished from the case where the work is abandoned by the contractor and the owner undertakes the completion thereof.

In an action on a building contract, where the amount ultimately found due the contractor was unliquidated, no interest will be allowed on such amount.

Although no sum may be due a building contractor on his contract when his lien is filed, the lien nevertheless attaches and is effective, to the extent of any sum subsequently becoming due thereunder.

*Clark v. Fleischmann Vehicle Co., Inc.*, 187 *N. Y. Supp.* 807.

# DEPARTMENT OF SPECIFICATIONS

CONCRETE SPECIFICATIONS—(*Continued*)

THE last article in this department discussed the erection of forms, the placing of reinforcing steel and the mixing of concrete.

It has been suggested heretofore (somewhat out of proper sequence) that the forms should be wetted in warm weather before the placing of concrete. This is mentioned again to bring it into proper sequence as the specifications should mention this procedure after the specifications covering the mixing of the concrete.

One other item deserves attention before proceeding with specifications for depositing operations. That is the heating of concrete ingredients during freezing weather. Although it may appear that construction operations will be carried to completion during warm weather one rarely can be sure that some unforeseen delay will not force some, if not all, of the concrete work into cold months. On the other hand, it would not be proper to include clauses covering heating of materials in work in our southern climate where the likelihood of freezing weather is rare if not totally absent. The frequently mentioned good judgment of the specification writer must be exercised here also as he should not be put in the class of one person who at one time called for trap rock for concrete coarse aggregates for work in a locality where no trap rock was available but where equally good broken stone of another geological character was in common use.

Concrete must be placed in the forms immediately after being mixed and deposited in such a manner that the ingredients will not become separated. One objection to the dropping of concrete from a height, aside from the possible separation of ingredients, is that air may be retained, forming pockets that may not be eliminated later. If such pockets occur along the forms they will be visible and may then be patched. But a number of such pockets may form a train of voids that will facilitate the penetration of ground water or free water if present and thus introduce hazards that should be carefully avoided. It is not probable that sufficient air pockets would be formed to introduce the factor of failure but, nevertheless, careless work of this nature should be prohibited.

The concrete should not be placed in piles to be spread through the forms later, but should be distributed evenly along the spaces from end to end, so that levels may be kept fairly uniform. Immediately after the placing of concrete it should be agitated and rammed with suitable tools to release entrained air and, where circumstances require, to produce smooth surface finishes. The choice of suitable tools should be left to the discretion of the architect's superintendent and the contractor except in the case of surface finishes, in which case a long, thin bladed tool may be required.

If coarse surfaces are desired it may be that the desired effect can be obtained by placing concrete of a dry mix, composed of aggregates of a small, uniform size along the side of the form, to be backed up with the general concrete. For decorative concrete surfaces, where coarse textures are desired the method of depositing the concrete must be given special attention, to insure sufficient control of the work. For reinforced walls the concrete must be rodded to insure complete surrounding of reinforcing and for thin walls or walls that are heavily reinforced the forms may be pounded to produce the proper degree of compactness.

In agitating the concrete to produce material of maximum density (and that is the prime purpose of agitation) the specifications should require that agitation cease when a distinct film of water begins to form on the upper surface of the concrete. If concrete is to be placed on top of it at once, the presence of this film may not be fraught with much danger but if there is a chance that a work plane will be formed this film is what produces laitance. Work planes are always difficult to handle in any way but the one correct way, except where the surrounding soil is permanently perfectly dry and, consequently, there is no danger of water seepage.

The best practice requires that when work of placing concrete in wall forms ceases at the end of the day, a key be formed longitudinally by a two by four inch scantling or a stick of timber of other suitable size and so shaped that it may be removed easily when the next day's work commences. Where reinforcing occurs it may be difficult to place a scantling flatwise, in which case, if it is laid on the two inch edge, a key of some sort at least may be made. Where water seepage may occur and the water tightness of the concrete is to be obtained by integral mixes the best method requires the placing of scantling for a key and, in addition, the installation of a copper or zinc strip set vertically to form a watertight dam. In any event the specifications should require that all laitance be removed from the surfaces of previous days' work, the waste swept off and the concrete then drenched and covered with a thin cement grout or one of the several available special bonding agents.

Vertical work planes occur at times, as well as horizontal planes. Should it be necessary to carry up one portion of a wall higher than another in a form that is continuous a bulkhead must be placed to stop the concrete. This bulkhead should have a key scantling placed on its inner face so that the proper keyed bond will bo obtained. It is not likely that any precautions other than those given above will require observance in the ordinary building. Special cases will occur where unusual factors require particular attention and the specification writer must be on his guard to detect such instances while checking the drawings.

In reinforced concrete work the effect on the strength of the structure is the controlling factor in the location of work planes. The concreting of beams, girders and slabs must be stopped at the exact center of the span and in a vertical plane. Where the "pan" system, consisting of tee beams and their slabs, is used the specifications should prohibit the forming of work planes between the slabs and beams or girders. This rule also applies to other tee beams and similar cases, where the action of the concrete depends on a monolithic, integral construction. A similar rule applies to work planes between columns and beams or girders. Where beams or girders are connected to columns (and in architectural practice this is the general rule) the column should be poured to the under side of the lowest beam or girder, and in all cases, the columns should be entirely complete in each story height, poured in one continuous operation.

The concrete for floor slabs, girders, beams or columns should be allowed to settle for at least two hours before the succeeding concrete is placed on them. This is quite an important element and should be specified distinctly. Where footings or walls should be poured in one operation the specifications should mention such needs unequivocally. This may occur in foundation work that is to be waterproofed where the possibility of work planes is not to be considered. Other needs of such precautions will occur and should be covered in a correct manner.

Where faces of concrete are exposed to premature drying the greatest utilization of the strength of the concrete will not be possible. On occasion custom sanctions the removal of forms from one side of a wall within twenty-four to thirty-six hours after tho last concrete has been placed. Since it is not always possible to anticipate the exigencies that will require the early removal of forms, or in the case of floor slabs, the easy protection of finish topping that may be placed on them (as customary in some classes of industrial buildings), the specifications should require that attention be given the prevention of premature drying out of the concrete. It is not well to specify the exact methods to be followed unless one desires to assume the responsibility that will rest with him when laying down conditions to produce certain results. It is generally better to trust the judgment of the contractor and the architect's superintendent to see that this work is accomplished in the most feasible manner. For the best quality of concrete the exposed surfaces should be kept dry for at least seven days. A shorter period may be sufficient, according to the moisture content of the atmosphere. In freezing weather other precautions, rather than the wetting of surfaces, must be resorted to, as the experience of the one in charge of the operation may dictate.

Since construction methods have been improved to such an extent as to permit the carrying forward of concrete work through winter weather the specifications should provide that precautions should be taken to see that the concrete poured at such times is adequately protected from freezing. The green concrete not only freezes but it may expand when frozen to such an extent as to cause damage of considerable amount.

The specifications ordinarily should not specify the manner of constructing expansion joints as this should be shown on the drawings. But it is necessary to specify that such joints are to be provided and indicate exactly how the separation is to be made and also the kind of filler that is to be used. Some thought might be given to the effect of expansion of roof slabs on the parapet walls, especially when the enclosing walls are carried outside the outer face of the structural framework. The reason for this suggestion lies in the fact that most roof leaks occur at flashings along vertical surfaces and it may be possible that a little thought on this factor may provide the explanation for some leaks the reasons for which have not been understood heretofore. No particular experience can be cited to prove that there may be merit to this suggestion; consequently it is given for what value there may be in it.

In some buildings that are to be faced with limestone the concrete framework may provide for some beams or slabs to bear on the walls that are so faced. If the forms for this concrete work are erected and the concrete poured complete before the enclosing walls are built it is not likely that damage will occur to the stone through staining, by the concrete. If, however, such wall bearing construction is to be placed after the walls are built the specifications must lay down certain protective measures that must be followed to prevent staining of the stone. The Indiana Limestone Quarrymen's Association recommends the omission of back-painting or stain-proofing and consequently all built-in faces of the stone would be exposed to cement stains. The concrete should be so designed that there will be at least one vertical course of brick between the stone and the concrete but as this is sometimes difficult to accomplish the most dangerous condition must set the standard of preventive measures. Dry roofing felt may be placed against the brick or stone or the brick may be coated with an asphalt compound. The type of protection requires careful study and it is hoped this suggestion will save some cautious specification writers from unfortunate difficulties.

In many construction operations, especially those of lesser magnitude the temptation to store materials on green concrete seems hard to resist. The specifications should prohibit the indiscriminate storage of materials on green slabs, especially during the time the forms are in place, and should require that no materials be placed on the reinforced concrete work until the architect gives permission for such use.

The matter of the removal of forms has been discussed in a previous article but a synopsis of it will be given here. Forms should not be removed until the architect so directs. His instructions should be based on the rule that floor slab forms should remain in place not less than seven days, the soffit forms for beams and girders two weeks and column forms seven days. Forms for sides of beams and girders may be removed when the floor slab forms are removed. Forms for exterior basement and retaining walls should not be removed until the forms supporting floor construction bearing on them have been removed. Where a retaining wall, such as an area wall, occurs the forms for it should be allowed to remain in place at least two weeks if the earth is bearing directly on the wall.

Upon the removal of forms the surfaces of some walls may require mechanical surfacing. This desideratum must be determined in the specifications and it may be necessary to ask for a unit price to cover such surfaces as later developments may require to be surfaced. Mechanical surfacing may be accomplished by hand, air or electric tools, in a number of different finishes. For general appearance a rubbed surface, produced by a rotary grinding wheel, removing the form marks, will be sufficient. More decorative finishes may be obtained, usually to the complete satisfaction of the architect. The concrete must be allowed to harden to some extent, the degree of hardness varying for the different finishes. For the finer ground surfaces the concrete should be quite hard, while for a chipped, straight tooled surface or bush-hammered surface the concrete may be somewhat softer.

Some building inspection authorities require the making of tests on reinforced concrete construction —generally floor slabs only—and the specifications should provide for the making of such tests in accordance with the legal requirements. The construction of the gauge should be specified, as also the number of readings and intervals between each series. As such tests essentially are made for workmanship and not design it is proper that the contractor do the testing, furnishing loading material and other needed items, as a part of his contract.

As a precaution it would be well to have the specifications require a general checking of locations on inserts, sleeves, thimbles and all other built-in devices after concrete has been poured so that incorrect or displaced items may be made correct without the trouble and delay that would ensue if this were postponed to a later date.

In a particular building there may be many features formed in concrete that are of a special nature and that must be given attention in the specifications. These may comprise a considerable part of the work when measured in dollars and consequently require particular attention. The judgment of the specification writer must be depended upon to eliminate descriptive matter that is or should be shown on the drawings and confine his instructions to the specific features only.

For the waterproofing of basement spaces the specifications either must be quite explicit in the choice of materials and their installation or else they must state only those surfaces that are to be made watertight and leave the materials and methods to be chosen by the contractor, with a general guarantee that the work is to produce a watertight shell.

In either case the water hazards must be described fully, that is to say, the facts regarding average water level, hydraulic head, character of walls and footings, means of joining walls and columns to footings and floors to columns and walls. Much of this will be shown on the drawings but the specification, to be complete, should carry a description of all conditions that will have a bearing on the final result.

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## STRUCTURAL DESIGN PROBLEMS

### A discussion of the present importance of the items of restraint, continuity and unbalanced moments

THE student of the mechanics of materials and structures first encounters the item of restraint when he learns that bending moment co-efficients are considerably modified by end conditions. He learns that $M=\frac{WL}{8}$ for a beam freely resting on end supports, becomes $M=\frac{WL}{12}$ when the beam is attached to the supports. Unfortunately many do not understand the "How" and "Why," their ignorance not being manifest during the period when their problems are simple and all their work is with wood and steel formed into standard shape and sizes. Such men experience much anguish of spirit when called upon to use reinforced concrete, for work in this material cannot be satisfactory unless one understands how continuity in a structure creates restraint and restraint sets up bending moments in the restraining members.

Take the case already referred to of a simple beam converted into a restrained beam by attaching the ends to supports. When a load is placed on a beam it deflects and the ends rise if they are free. To convert it into a restrained beam it is necessary so to fasten the ends that at the support the fibers will be horizontal and remain horizontal no matter how heavy the load. Any load will cause a beam to bend but, owing to stiffness, downward bending of a restrained beam begins at a point some distance from the support. The restrained ends form cantilevers carrying a suspended span. The end of the cantilever section where the neutral plane reverses curvature is variously known as the "point of inflection," "point of contraflexure," or "point of reverse bending moment."

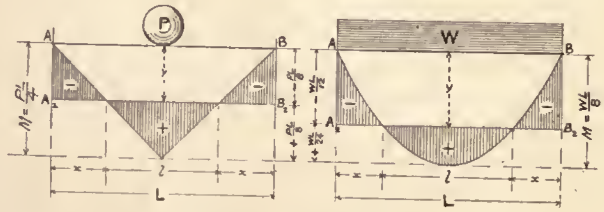


Fig. 1. The restrained beam with a concentrated center load and a uniformly distributed load

In Fig. 1 two beams of single span are shown, one carrying a concentrated load, $P$, and the other a uniformity distributed load, $W$. The line $A$, $B$ represents the neutral axis of the beam. A condition of complete restraint exists when the beam extends beyond $A$ and $B$ a certain distance and the ends carry loads which set up negative bending moments balancing the positive moment on the beam. The imaginary end extensions are called "mirror beams" and an equally good idea may be had by drawing the bending moment curve, a triangle under $P$, a parabola under $W$, and dropping $A$ to $A_2$, and $B$ to $B_2$, so the sum of the negative moment areas on the end spans $x$, will be equal to the positive moment area on the intermediate span $l$.

Consider first the concentrated load $P$. Neglecting the weight of the beam, $M=\frac{PL}{4}$. Plot this to any scale downwards from the line $A$, $B$ and draw lines from the end to $A$ and to $B$. A triangle thus made is the bending moment diagram for a concentrated center load and the bounding lines are called the "moment curve." The curve includes a "moment area" which is equal to $\frac{AB\times M}{2}$, which is the expression for the area of a triangle having a base $A$, $B$ and a height $M$.

The problem is to drop the neutral plane $A, B$ to a position $A_2, B_2$. Divide the moment area by the base, $A, B$, thus obtaining $y$. Set off this distance downward from $A, B$ and draw a line from $A_2$ to $B_2$.

From the principle of similar triangles $x = \frac{L}{4}$ and $l = \frac{L}{2}$, this fixing the positions of the points of contraflexure. The moment areas were equated by superimposing upon the moment area figure a rectangle of equal area with equal base.

For the uniformly loaded beam the moment area diagram is a parabola with a height equal to the maximum bending moment, which is $M = \frac{WL}{8}$. The area of a parabola is equal to two-thirds the height multiplied by the base. Two-thirds of $M$ is $y$, which is set off below the line $A, B$ and a parallel line $A_2, B_2$ is drawn, thus superimposing on the parabola a rectangle of equal area with equal base. The sum of one end negative moment and the positive moment for the short suspended span, $l$, is equal to the total moment as shown in the drawing. The length of $x$ remains to be found.

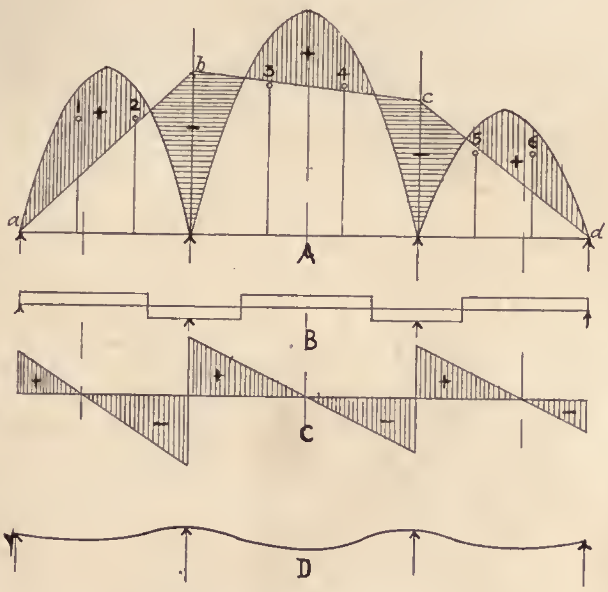


Fig. 2. The Continuous Beam, Method of Characteristic Points

Let $w$ = load per lineal foot and $\frac{wl^2}{8} = \frac{wL^2}{24}$;

eliminating $w$ and dividing; $l^2 = \frac{L^2}{3}$

$$l = \sqrt{\frac{L^2}{3}} = \frac{L}{\sqrt{3}} = \frac{L}{1.732}$$

When $L = Unity = 1$, $l = 0.5773\ L$; then $L = 2x + l$, and $x = 0.2113\ L$.

Continuous beams rest on three or more supports, the usual condition being that of non-restraint. The usual analysis assumes an edge, sharp or rounded, at each support and thus each span is freely supported. When any span is loaded the tendency of the ends to rise is counteracted by the stiffness of the beam in the adjoining span or spans. If the moment of inertia is constant throughout on equal spans and each span is uniformly loaded with the same unit load a condition of nearly complete restraint exists over all interior supports. The extreme ends must be attached to their supports to produce complete restraint in each span.

In the usual analysis of continuous beams no bending is set up in the supports, a condition which is never realized in practice. All restraint is assumed to be caused by the stiffness of the beam, whereas in practice the width of the support causes friction and the support is pulled toward the more heavily loaded span in case of unequal loading. In many structures there is a positive connection of beams to supports and the structure responds throughout to deformation in any span. Maxwell's Theorem of Reciprocal Deflections covers this condition and will be referred to in a succeeding article.

Fig. 2 illustrates a simple graphical method for determining bending moments, shears and reactions in continuous beams. It is known as the Method of Characteristic Points and was first described by Prof. T. Claxton Fidler in *A Practical Treatise on Bridge Construction,* about 30 years ago. In the example selected the beam has unequal spans and is uniformly loaded. On each span the bending moment curve, a parabola, is drawn as if each span were freely supported.

After drawing the moment curve each span is divided into three equal parts and vertical lines are erected as shown at *1, 2, 3, 4, 5* and *6*. The length of each line is equal to two-thirds the height of the parabola in which it is contained. The small circle at the upper end encloses the "characteristic point" at the end of the line.

In this example the extreme ends of the beam are not restrained so *1* and *6* are disregarded in the work that follows. In each end span a straight line is drawn from the end support on an upward slope to pass near *2* and *5* to an intersection with a vertical line extended upward through the interior support. The points of intersection are connected by a straight line across the center span, giving a broken line *a, b, c, d.*

This line can occupy but one position; which is located by trial. It must close at the end supports

$a$ and $d$. From $a$ it passes below point $2$ to $b$ and from $b$ it passes above point $3$, at distances inversely proportional to adjacent spans. For example, if the spans were equal the distance the line, $a$, $b$, passes below $2$ would be equal to the distance the line, $b$, $c$, passes above $3$. The spans being unequal the distance below $2$ exceeds the distance above $3$ in the ratio of the second span divided by the first. In the third span the line

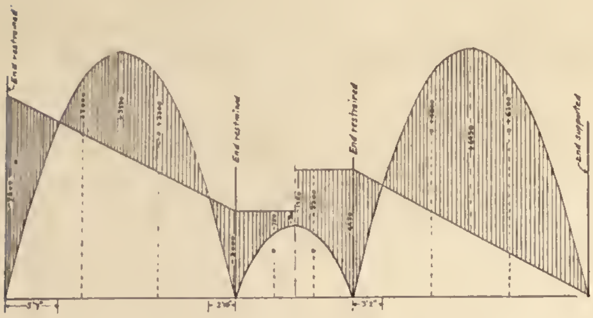


Fig. 3. Cross-section of a school floor with full dead and live loads

from $d$ to $c$ passes above $5$ and the line from $c$ to $b$ passes below $4$ in a similar fashion. When the closing line is located the bending moment at any point is the vertical intercept between the closing line and the moment curve. Intercepts on the interiors of the moment curves are positive, as shown by vertical hatching; intercepts on the exteriors being negative, as shown by horizontal hatching.

Assuming the extreme end supports to be restrained the closing line will pass through $1$ and $6$, closing on a vertical line extended upward through $a$ and $d$. There is but one possible location for the closing line, which must pass on opposite sides of adjacent characteristic points.

At $B$ the lengths of the cantilever and suspended spans are determined by vertical lines dropped from the intersections of the closing line with the moment curve. The shears and reactions are shown at $C$, the point of zero shear being determined by a vertical line dropped from the point of maximum positive bending moment. The reaction on the edge of each support is equal to the shear at that point, the total reaction on any support being the sum of the positive and negative shear. The deflection of the beam, greatly exaggerated, is shown at $D$.

The Characteristic Point Method may be applied to any number of spans, equal or unequal and for any condition of loading. Kidder gives graphic methods to use for determining bending moments in beams for all conditions of loading. For concentrated, or combined distributed and concentrated, loads such bending moment diagrams are constructed instead of parabolas. The spans are divided into three equal parts by vertical lines and characteristic points are marked on these lines. The shape of the bending moment curve determines the heights of these points, it being necessary first to find the total moment area.

Let $A$ = the total area of the moment diagram.
$x$ = distance from left end of span to center of gravity of the moment area.
$L$ = span.

then $\frac{2A(L-x)}{L^2}$ = height of point at left

and $\frac{2Ax}{L^2}$ = height of point at right.

The points being located the closing line is drawn as described for Fig. 2.

The preceding work applies only to beams with constant moment of inertia. If, owing to differing span lengths, different loads, etc., changes in section are made in the continuous beam, so the moment of inertia on any span differs from that on an adjoining span, a slight alteration in procedure is made. The heights of the moment curve are computed on each span by using the true span length and loads. To draw the figure and obtain the characteristic points, the closing line, shears and reactions, use artificial spans obtained by dividing the moment of inertia *in inches* by the span *in inches*. On these artificial spans erect the true moment heights and draw the moment curves.

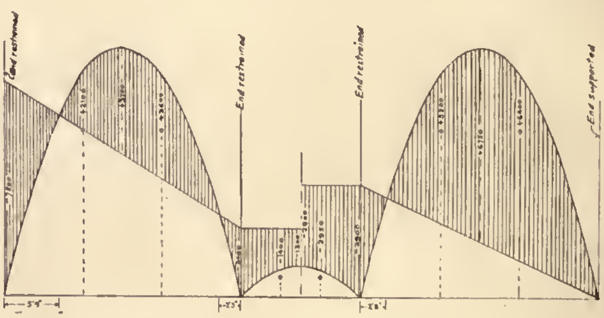


Fig. 4. Cross-section of a school floor. End spans with live and dead loads. Corridor span without live load

About ten years ago a school building was built in a mid-western state, the floors being of reinforced concrete. The designer used specifications required in a near-by city and took for coefficient $c$, 10 for the outer spans and 12 for the corridor span, in the formula $M = \frac{wl^2}{c}$. The effect the two long spans would exert upon the short middle span was not taken into consideration. The designer confessed later that he had never studied the theory of continuous beams, blindly using formulas given to him in ordinances and hand books.

The contractor for the terrazzo floor of the corridor was twice required to replace the floor on account of cracking. He employed the writer to help him out of trouble when cracks again appeared. Fig. 3 shows the diagram the writer made to ascertain the bending moments for total live and dead loads on the three spans. To economize space but one-half the width of the building was drawn, it being symmetrical about the vertical line through the middle of the short center span. It was thus possible to show conditions on the left assuming perfect restraint at the wall and on the right assuming the end of the slab to be freely supported. No positive moment was found in the intermediate span.

The assumed conditions could exist only for a few minutes when the two school rooms might be occupied and children would be marching through the corridor. Fig. 4 was then prepared by assuming the school rooms to be occupied and the corridor empty, that is, the center span carrying dead load only and the long outer spans carrying live plus dead load. This is the condition existing during practically all of the school day.

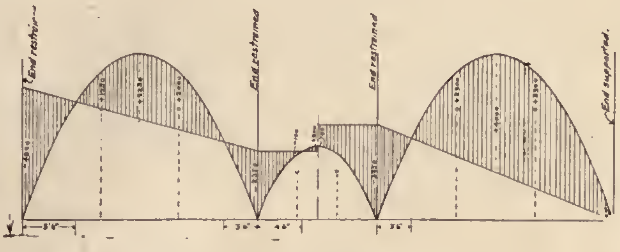


Fig. 5. Cross-section of a school floor. Corridor with live and dead loads. End spans without live load

Fig. 5 was prepared on the assumption of conditions which might exist for a few minutes during each recess period, corridors with full live load and school rooms empty. Loading tests confirmed the diagrams and the terrazzo floor contractor was paid for the extra work he had been compelled to do because of faulty designing. Some of the reinforcement over supports was cut in order to reduce the effect of continuity to the amount originally assumed by the designer and no more trouble was reported.

(*To be continued*)

# ELECTRICITY IN THE HOUSE

## V—THE BED ROOM

BY M. O. WHITTON

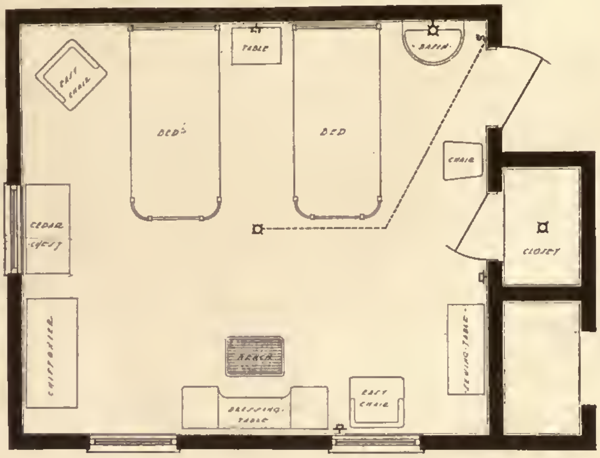
IT is only of very recent years that anyone has paid much attention to the adequate wiring of a bedroom. Before that, people were supposed to be content with one bracket lamp, placed somewhere near the door, or a central fixture, from which depended a lengthy brass chain, or sometimes even a piece of string, for which the owner fished in the dark. Nor was that individual supposed to complain; he was to be thankful that he didn't have to light a match besides. If one were very particular, the central fixture might be switched from the doorway, but that was about the loftiest flight of imagination in the way of electric luxury in a sleeping room.

One suspects that the impetus towards improved bedroom wiring came from city hotels which seized upon the advantages of electric lighting, to add to the attractiveness of rooms otherwise none too large or light. Hotels started the custom of placing a bracket so that patrons might read in bed; hotels switched their lights from convenient places in the hope that guests might thus be encouraged to turn them off when not in use; hotels installed bracket lamps on either side of bureaus and dressing tables, so that patrons would have no cause to complain of lack of daylight. And the home-owning and home-building public, occasionally patronizing these hotels, enjoyed these conveniences and gradually set to work having them installed in their own premises.

Action and reaction being equal and opposite in this as in all things, from undue neglect of bedroom wiring, we swing to possible over-emphasis, for now we hear not only of the most elaborate wiring plans, but also of complete sets of bedroom furniture entirely wired for every possible emergency in the life of man,—or woman. Furniture dealers, we are told, are keenly interested in the new development, and predict the largest of sales from it providing,—and here follow some practical suggestions worth noting. It is thought that the present standard wiring fittings for wall work will have to be adapted and made smaller for furniture; and it is intimated that the wiring ought to be somewhat simplified so that its cost, added to that of the furniture, may not be prohibitive of popularity.

Bearing these suggestions in mind, it seems possible to outline a wiring plan for a bedroom, which shall be sufficiently flexible to meet present-day usage, and still escape the pitfalls of the faddish or the extravagant. While the greatest possible wiring elaboration, both as to room and to furniture may be desirable in certain definite circumstances, yet for ordinary conditions, a compromise between the two extremes will usually be found happy. In selecting and furnishing a room to typify the modern sleeping room, the writer has consciously refrained from recommending the wiring of everything possible to be wired, in favor of presenting a room suitable to the intelligent use of an intelligent family.

The room here depicted is 14 by 16 feet in size and has daylight on two sides. Between two windows on one side will be found the dressing table, while the chiffonier is placed in the corner where it will receive daylight from two sides. Beds, flanked by a hand basin, are placed on the longer wall opposite the two windows, while a closet door breaks into the fourth wall. The sewing table is placed between this and the window to the left of the dressing table. Two easy chairs, two small chairs, a cedar chest used as a window seat, and a small table between the beds complete the furnishing of this room.



Ceiling Outlet Bracket Outlet Base Receptacle S Switch

A home bedroom may be as convenient as a hotel bedroom when adequately wired

The lighting arrangements themselves are also comparatively simple. In a room of this general size and description, one central fixture, controlled by a switch to the right of the entrance door, will be found sufficient for general illumination. Over the wash basin, however, a bracket light is added. Were the room larger or darker, two brackets might be allotted at either side of the dressing table, but for the arrangement shown here, the central lighting fixture will probably give all the needed illumination at the dressing table. To the left of the table, however, a double wall outlet or baseboard receptacle is recommended; this would supply a lamp to be placed upon the dressing table, if local illumination were desired, and also an outlet for connecting the electric curling iron, hair dryer, and other toilet articles usually considered more or less necessary for feminine comfort. If it were desired, one of these outlets could be connected to a socket placed upon the dressing table itself, at the back or in some other inconspicuous location. In some instances, it might be thought better to have the dressing table itself entirely wired; this however, would depend upon the tastes of the occupant of the room.

To the left of the sewing table, another baseboard or wall outlet is indicated. This would serve as source of supply for a small electric sewing machine, which could be stored away in the closet when not in use, and then set out upon the sewing table. This location would also be a suitable point from which to operate the vacuum cleaner, or into which to plug an electric radiator in cool weather. For the closet, an electric light is most emphatically recommended. It may be placed in the simplest of fixtures, or it may dangle at the end of a utility cord, but even in its crudest form it will be of the greatest convenience to the householder.

But one more source of supply remains to be explained, and that is the double baseboard or wall outlet indicated between the beds, and behind the small table. The question then arises, shall the beds themselves be wired, or will some lesser degree of modernity be found satisfactory. The full program for wired beds requires wooden frames, into the head of which are inserted bracket reading lamps. Under one or both beds would also be a small light, designed for night use, or in case of sickness. Then, at a convenient spot for use from the bed, there would be a socket for the plugging-in of a heating pad, cooking device, fan, vibrator, or whatever appliance was needed by the occupant of the bed.

Against this full program are a few objections; for instance, at the one extreme would be pieces of furniture of such value that no one would like to have cut into; at the other extreme would be the modern metal bed, which could not be cut into. The writer believes that in many cases a middle course may be well taken by making use of a small table placed between the beds, as indicated in the plan, and having this table wired, so that it can supply a reading lamp, and the desired connection point for the electrical appliances to be used in case of illness, or for greater convenience in taking care of an invalid. This wiring of a bedside table is a part of the wired furniture program that the writer can heartily recommend as simple, inexpensive, and highly effective in promoting comfort in living.

A discussion of the proper wiring of sleeping rooms would not be complete without a few suggestions for the arrangement of children's rooms or nurseries. The wiring would not differ greatly in essentials from that for the adults' sleeping room, except that it would probably be simpler. Care should be taken that the light will not shine in the eyes of the child when in bed, for the younger the child, the greater the possible injury to the eyesight. If the architect is unable to govern the placement of the furniture, he can bring out the same idea, by using two or more small bracket lights (depending on the size of the room,) and having these equipped either with fairly low wattage lamps or ordering frosted bulbs for the fixtures. Because of its greater safety, and freedom from fumes of all kinds, an electric radiator is usually provided as an auxiliary heating device in a child's room, and this should be operated from a baseboard or wall outlet. As in other rooms, it is better to make this a double outlet, so as also to arrange for the use of the vacuum cleaner, a heating pad, a milk warmer, hot water cup, or similar appliance that would be employed in the care or feeding of a young child. As a last possible precaution against accident, the architect can order his lighting brackets to be of the torch design, rather than the type of fixtures with pendant bulbs since the latter may possibly become loosened and fall upon the head of some unlucky or inquisitive small person.

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## Notes on Materials of Construction

A SERIES of interesting tests was conducted at the Underwriters' Laboratories at Chicago on April 6, for the purpose of testing frame construction covered with metal lath and three coats of plaster. The tests were made on completed floors and walls in full size sections about 10 feet by 10 feet in size. It is reported that after an exposure to intense heat for one and one-quarter hours the covering was still intact and the wood only slightly charred on the edges.

THE Slate industry in joining the movement to eliminate waste is urging upon architects the advisability of considering this material for copings, sills and heads of windows, steps, walks and even walls of buildings. Much good along these lines, has been accomplished. Slate is also an excellent material for carving and has been used in the form of rough stone panels with carved letters. When the material is thus utilized the percentage of waste in quarries and yards will be reduced, this in turn resulting in a lessened cost of slate for roofing and structural purposes.

In a study of slate sizes for structural use, water closet enclosures were studied and it was found that by a slight change in a long used form of joint where the ends and partitions joined the back, that one hundred and twenty combinations and sizes of enclosures could be produced from only thirty-five sizes of slabs.

Nearly all such enclosures had the ends run into the back wall and the backs set between them, making the ends one inch wider than the partitions. Butting the ends against the backs, made both ends and partitions the same size, reducing thus the time of getting out two different sizes of slabs and the storage, selection, packing and checking up of their installation at the job. The same is true of the backs. By making the end enclosures one-half inch narrower than the interior enclosures, it was found possible to make all back slabs exactly the same width, with corresponding simplification of production and use.

IN July, nineteen-twenty, several hundred representatives of the wood working industries of America, assembled at Madison, Wis., to celebrate the tenth anniversary of the founding of the Forest Products Laboratory. In commemoration of the event a Decennial Record was printed and is now being distributed.

The uses of wood are manifold, yet more than one-half of the timber cut each year is for structural use. The laboratory is collecting data for determining the use and design of wood and things made of wood; effect of defects; the selection of wood; the standardization of grading rules and building codes and the economic utilization of structural timbers. All this is told in the record, together with a history of the war work of the Laboratory, a fascinating story in itself; as well as work done for the makers of containers for shipping goods; the preservative treatment and the chemical utilization of wood. The record is a well printed and handsomely bound book of 196 pages, the price of which is $1.75 the copy, as long as the limited edition lasts.

ALUMINUM shingles are now on the market. The cost of reducing this metal has been falling rapidly since the war. Stories are circulating in chemical circles to the effect that in some industries material from which aluminum may be produced in an embarrassing by-product so that aluminum at five cents a pound or lower is not an unlikely possibility.

The new aluminum shingles are said to be as enduring as bronze, as light as paper, as agreeable in color as aged wooden shingles and easy to apply. The cost is said to be about the same as tile at present. There are 86 shingles to 100 square feet, the exposed surface being 12 by 14 in. The weight is about 40 lbs. to the 100 sq. ft.

APART from the larger displays by the Bureau of Standards and Federated Engineering Societies, one of the features of the recent Building Conference held by the National Federation of Construction Industries at Chicago in April, one particularly commended was that installed for the Indiana Limestone Quarrymen's Association. It showed the progress that has been made in the adoption of a uniform classification for a building stone, standard specifications and standard practice relating to the furnishing of samples.

A VENERABLE brick from the Great Wall of China passed the customs officials and has just been received by the Engineering Museum of New York University, said the *New York Evening Post* in a recent issue. The brick was secured by Dr. Lawrence A. McLouth, professor of Germanic languages and literature at the university, who returned last fall from China after spending a year as exchange professor at Tsing Hua College in Peking.

The United States customs officials, although familiar with the collections of antique hunters, were more than usually suspicious of the brick. They drilled into it, sawed an end off it, and tested it in various ways for smuggled goods, but, finding it harmless, finally released it.

## The Portable Motion Picture Booth

MANY states and municipalities have passed laws requiring the use of portable booths for motion picture exhibitions conducted in assembly rooms not equipped with standard fixed booths. The natural inference to be drawn from this legislation is that a good portable booth is regarded in many localities as adequately safeguarding the use of nitro-cellulose film. Portable motion picture booths are frequently used in places where the discharge of either flame or smoke in the room would have a tendency to produce a panic, while the flame might ignite combustible material in the vicinity, and the smoke carries with it the additional danger of suffocation.

The April, 1922, *Quarterly of the National Fire Protection Association* contains a report of Underwriters' Laboratories on an investigation of a portable booth designed to minimize the above mentioned hazards and intended mainly for use by non-professional operators in schools, churches, lodge halls and places of assembly where fixed booths have not been installed.

Among the conclusions reached the following are of most interest from the standpoint of safety to life and property:

LIFE HAZARD:

The booth as designed does not furnish the protection to life necessary in a device of this kind.

In each of the Fire Tests either the quantity of smoke or flame was sufficient to induce panic.

SUMMARY:

The investigation indicates that the feasibility of constructing a practical portable booth which can be depended upon to reduce both the fire and life hazard is problematic and emphasizes the desirability of confining the use of nitro-cellulose film to buildings provided with fixed booths vented to outside air and to professional operators.

It is essential that a booth which materially reduces the hazard to life and property should be so constructed as to permit the burning of film without smoke and at the same time so muffle the flames that they cannot be seen in great volume or set fire to combustible material near the booth.

With a view of meeting these essential requirements the manufacturers of the booth forming the subject of this report have insured perfect combustion by providing openings for the admission of air and have unsuccessfully attempted to confine the flame to the booth by wire screening and baffle plates. In general, the results of the test were not such as to encourage the submittors in attempting to control the flame in this manner; and the protection to life and property provided by the final construction is considered as being little if any greater than were the films burned in the open room.

The results of the entire investigation emphasized the necessity for using slow burning film rather than attempting to safeguard the use of nitro-cellulose film under the conditions given.

## Gas Made from Leaves

GAS is made by the dry distillation of leaves, says *Industrial Digest*. Such gas has a calorific power of 3500 calories which compares well with coal gas of 5000 calories. This product may be used in the same burners as is employed with coal gas. Inasmuch as foliage gas does not contain even a trace of such impurities as sulphuretted hydrogen, ammonia, etc., which are found in appreciable amounts in coal gas and which must be removed before the latter can be used for lighting or cooking, the new product is very well suited for this purpose. The Deutsche Gas A. G. has applied this process successfully and is using potato plants, pine needles, tan-bark waste, kitchen refuse and other waste products for making gas.

## Steel Basement Windows

MANUFACTURERS of steel sash have recently placed on the market a new product and the humble cellar window has come in for publicity.

Exterior view of typical basement window with steel frame and sash

The illustrations here presented give a fair idea of the general appearance of a cellar window in which steel is used. The glazed area is about fifty per cent. greater than it is in the same opening with sash and frame of wood.

This exterior view of a steel basement window partly open shows the small obstruction offered by the steel frame

The steel basement window is made in unit sizes and is carried in stock. The sash is attached to the frame by means of heavy steel hinges at the top and swings inward at the bottom. Removable hinge pins allow easy removal of the sash for glazing or protection of the glass.

Interior view of typical steel basement window opened

In cost these windows are formidable competitors of the old established wood type. A number have been installed at prices much lower than were asked for wood sash and frame windows and the difference will be greater with an increase in demand. Not only is the glass area greater but the installation is more simple and readily made; the frame and sash are firesafe, indestructible and weatherproof. An item of great importance is that a steel basement window cannot warp or stick.

## The Design of Hotel Plates

TESTS carried out at the United States Bureau of Standards indicate that the design of the rolled edge and the angle of inclination of the rim of hotel china plates has as much effect on the ability to withstand chipping as the properties of the body from which the plate is made. The glazes now in use appear to be sufficiently well constituted chemically to withstand the alkaline solutions employed in dish washing.

## Lighting a Basement Stock Room

THE A. C. Eynon Plumbing Company, Canton, Ohio, has a stock room in the basement lighted by prisms set in the floor of the display room. The prism lights have been in use for about ten years and the grinding of the upper surface by the shoes of people visiting the store seemingly has had an effect almost negligible in affecting the transmission of light. The area equipped with prisms is 20 feet by 33 feet and the owners say it is transparent enough to enable them to dispense with artificial light in the stockroom during working hours.

This method of lighting a basement is not uncommon. The news item is of importance as being a record of experience covering a number of years and such records are valuable in relation to their sources.

# THE AMERICAN SPECIFICATION INSTITUTE

19 South LaSalle Street, Chicago, Ill.

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CHESTER L. POST

The American Architect and The Architectural Review *has gratuitously set apart this section for use by The American Specification Institute.*

*The Editors and Publishers assume no responsibility for any statements made, or opinions expressed.*

*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review.

On the first of May the Executive Secretary's office was removed to 19 South LaSalle Street, Chicago. Members are requested to make sure that the new address appears on their records.

### The Annual Meeting

The annual meeting of the Institute was held on the first of May at the Hamilton Club, Chicago. The Board of Governors was re-elected, as indicated at the head of these columns. The Board of Governors re-elected Mr. Ralph W. Yardley, Chairman; Mr. Frank A. Randall, Vice-Chairman; Mr. Gardner C. Coughlen, Acting Executive Secretary. The Chairman re-appointed Mr. R. Jarvis Gaudy, Chairman of the Advisory Committee.

The financial report for the past year will be sent to the members shortly.

### Chicago District Meeting

After the annual meeting those present started preliminary organization of the Chicago District Section under the direction of Mr. George C. Wright, of George C. Nimmons & Company, the district member of the Advisory Committee.

Meetings of this section will be held monthly and all members in Chicago or vicinity are requested to ascertain from the Executive Secretary's office the date of the next meeting if they are not resident in the district. Those members resident in the district will receive proper notice.

### The Spring Conference

The Spring Conference was held on the evening of April 21 at the Chicago Engineers' Club. Mr. John De Las Cassis, of the W. P. Nelson Company, answered questions and offered many interesting suggestions for the concise preparation of specifications for painting. It was the general concensus that specifications for this branch of construction are sadly in need of improvement and much constructive criticism was offered.

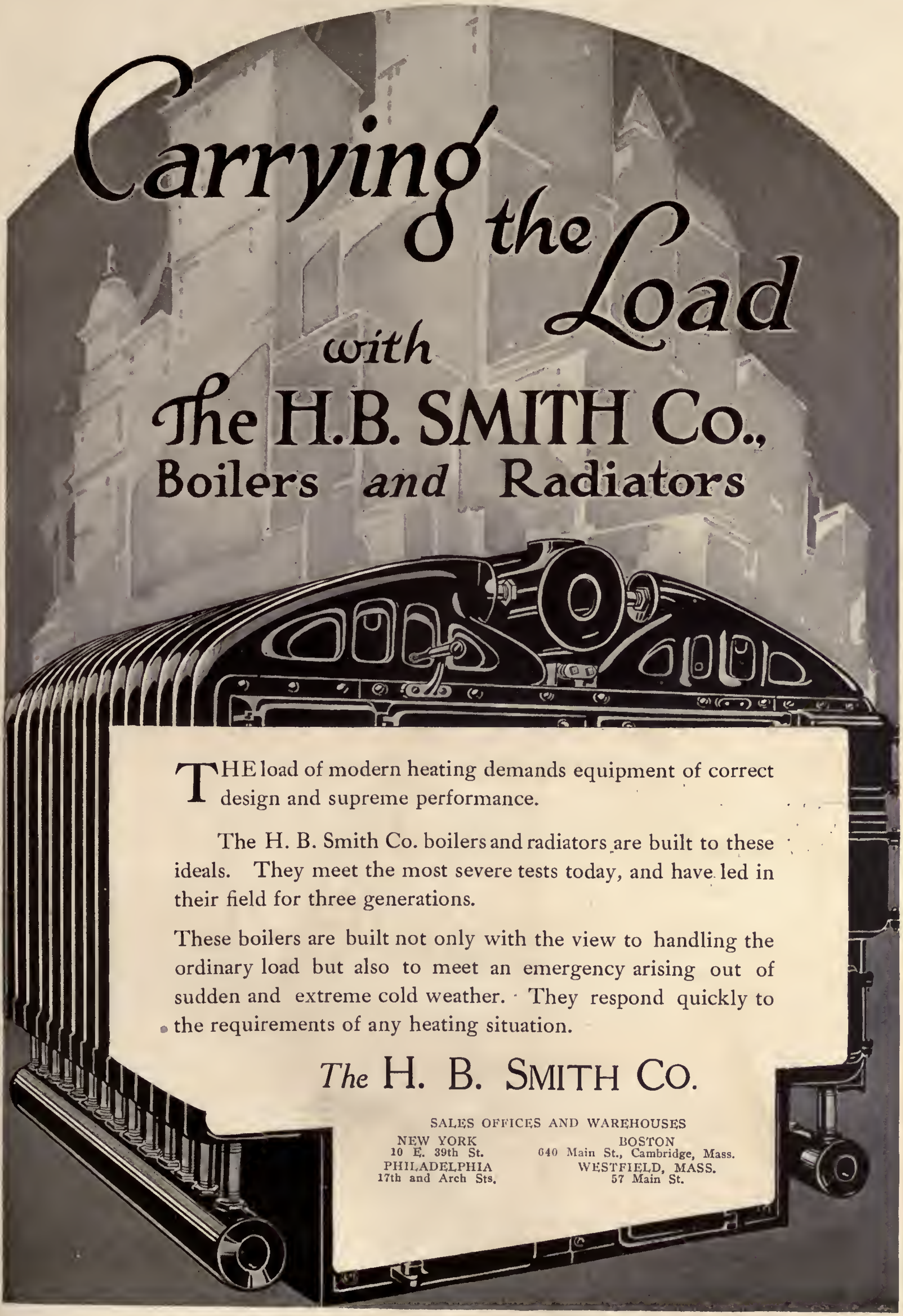
As this Conference was held for the purpose of discovering fundamental defects and analyzing the suggestions for improvement no immediate results were obtained. There is now in preparation a detailed report of the meeting, a copy of which will be sent to each member.

As a result of one suggestion a committee is now preparing questionnaires to be sent to paint, varnish and stain manufacturers and to painting contractors of established reputation to elicit information that will be essential to the clarifying of several phases of this work. Members are requested to send to the Executive Secretary's office the names of painting contractors who will be able, through long and varied experience, to lend assistance of value.

### New Members

The following new members have been elected:

Walter Bradnee Kirby, Architect, New York City.
Robert H. Orr, Architect, Los Angeles, Calif.
Delbert K. Perry, Architect, New Britain, Conn.
Jack A. Scanlan, Engineer, Chicago.
J. Binford Walford, Architect, Richmond, Va.
MacKenzie Waters, Architect, Toronto, Ont.
Edgar A. Rassinier, Architect, Louisville, Ky.
Walter Harold Lewis, Architect, Philadelphia, Pa.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THE load of modern heating demands equipment of correct design and supreme performance.
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### Elihu Root Receives Medal In Recognition of His Services to L'Enfant's Plan for Beautifying Washington

IN recognition of Elihu Root's services to the commission which undertook the rehabilitation of Washington, D. C., on the original design of L'Enfant, a group of artists and architects on May 3 presented a gold medal to him at a dinner in the University Club.

The group arranging the ceremony comprises about eighty members of the Diplomés Architects Society of New York, the American members of the Société des Architectes Diplomés par le Gouvernement Francais.

"Mr. Root has a long and extremely important record in his efforts in behalf of American architecture," said John Mead Howells, president of the American group, in a statement telling of the honor. "Mr. Root, Mr. Roosevelt and Mr. Taft were responsible for the rehabilitation of the original plan of Washington, D. C., designed by L'Enfant and approved by Thomas Jefferson.

"It was, however, Mr. Root's untiring support which made possible the work of the commission, consisting of McKim, Burnham, Olmstead and Saint-Gaudens. As Secretary of War and Secretary of State he did everything in his power to drive as many stakes as possible in pinning that plan to the District of Columbia, to use his own words.

"Mr. Root also made possible the establishment of the National Commission of Fine Arts in Washington, and he helped to organize the American Federation of Arts."

### New Orleans Skyscraper 147 Years Old Still Standing

THE following story of New Orleans' first skyscraper, reprinted from a recent issue of the *Times-Picayune,* is an interesting account of some of the earliest construction work done in the skyscraper field:

"Towering high above the city, the skeleton frame of the new Hibernia Bank building rears its cupola, twenty-three stories in the air. Below, the masons already are at work placing in position the great blocks and graceful arches that will form the outer walls of the structure. It is the highest building ever erected in New Orleans.

"And within sight of the towering cupola, nestled in a strange huddle of dwellings, far down the Rue Royale, the first skyscraper of old, old New Orleans still stands.

"Stripped of all its old time grandeur with its queer narrow hallway and still narrower stairway, it stands a venerable reminder of those other days, when, in its brave finery of hand wrought grills and slender gallery railings, the first skyscraper caused fashionable Nouvelle Orleans to gasp in wonder.

"It was in those brave old days of Spanish occupation, three years before the minute men of Lexington had fired the first muskets in the struggle to make the colonies free, that the first 'towering landmark' was built.

"Tradition still tells of the horrors experienced by those old Creole fashionables when the new owner of that little tract of land on the Rue Royale, at the corner of what is now St. Peter Street, told his neighbors that he was about to build the 'mammoth' four-story-and-a-half 'scraper.' And of the vigorous protests that were made in the old Cabildo, the structure in which Don Alexandro O'Reilly ruled, perhaps to the doughty Irish-Spanish leader in person, against that soaring structure by those who feared that such a spindling, mountainous plinth would topple into the streets if, perchance, the winds blew briskly.

"But, if Don O'Reilly heard these pleas, he was busied with other affairs in those days of 1774. The building shot skyward. Nor were the fears of those old Creoles realized. It still stands today, despite the fire that swept its neighbors to the south, destroying even the Cabildo, in 1780, together with the records that should give the history of its construction.

"But now evil days have come to the old building, and now, while its splendid neighbor soars skyward, its status is that of a tenement."

### Summer Courses at Pittsburgh

A VARIETY of subjects is offered for the summer session at Carnegie Institute of Technology, Pittsburgh, Pa. Courses of six weeks and eight weeks will be given in the College of Fine Arts, College of Industries, Margaret Morrison College and the College of Engineering.

The work of the summer session at Carnegie is arranged to meet the needs of teachers, undergraduate students, and others interested in technical subjects. The courses for teachers are scheduled for six weeks from July 5 to August 12. Eight weeks' courses will run from June 26 to August 19.

Courses are planned for architectural draftsmen who desire additional training in design and working drawings, and for those who are planning to enter the Institute. Subjects offered are design, working drawings and superintendence and outdoor sketching.

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FROM THE ORIGINAL SKETCH BY WILLIAM MITCHELL KENDALL

# THE AMERICAN ARCHITECT

## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, MAY 24, 1922 NUMBER 2394


# McKIM, MEAD & WHITE—A HISTORY

BY LIONEL MOSES

IN 1872 Charles Follen McKim entered upon the practice of architecture in New York City. He had been a student at Harvard, had studied at the Ecole des Beaux Arts and had spent two years in the office of Gambrill and Richardson. In 1878 McKim formed a partnership with William Rutherford Mead and Wm. B. Bigelow, the latter retiring from the firm during the following year.

Mead had been graduated from Amherst in 1867, had spent several years in Russell Sturgis' office, had studied a year in Florence at the Accademia delle Belle Arti, and had traveled extensively.

In 1879 Stanford White, a New York University man who, too, had been in Gambrill and Richardson's office at the same time as McKim, after an extensive trip through Europe, joined the others, and the firm of McKim, Mead and White came into being.

From the very beginning of this partnership the work of the firm revealed a quality of architectural design different from and far superior to that which then prevailed, and in due time the firm became noted among the foremost of the architects of the day, taking rank beside a limited number of others whose work showed a high degree of talent, and who had already been in practice for some time.

The American Academy in Rome (1913)

It must not be thought, however, that recognition came suddenly. In the beginning the firm experienced difficulties and discouragements similar to, but even greater than, those that exist at the present time. But with minds ever set on highest principles of service and art, recognition was bound to come. When once it commenced it grew steadily until, throughout the art world, both here and abroad, McKim, Mead and White became famous, and the buildings designed by them were admired and publicly praised for their architectural beauty. They were hailed not only as great artists but also as pioneers. As building after building was erected, the public became better educated in architecture and evinced a growing desire for beautiful edifices.

Were appreciation of Charles F. McKim, William Rutherford Mead and Stanford White to end with the expression of admiration of their buildings, and praise of their successful blazing of the trail leading to the development of popular taste, their fame would still be secure; but they were more than great designers and public educators. Their early experiences; their love for the beautiful; their passion for good architecture; all caused them to look far into the future even at the time that they were at the pinnacle of success. Those who were intimately connected with them at this time fully know to what extent they did look forward and with what devotion they laid the foundation for the future of the art of architecture in this country. Those whose good fortune it was to be so connected, realize that these men were always teaching, helping and encouraging all who were in their office in order that, when they should go forth as practitioners, they might uphold the standards of the profession as these standards should be upheld.

By this attitude toward art, public and student, the firm became more than a mere office. It became an institution, just as truly as though "College" or "University" had been appended to the firm name.*

But there is an additional proof of the truth of the assertion that the firm, McKim, Mead & White was, in character, an institution and that

It was but natural that the selections should be the very men who, in increasing measure, year by year, had contributed a vital influence to the work of the office. As a matter of fact, the work of the men later to be selected had already blended completely with that of the others. Internal changes had taken place without the slightest jar, transition having been so gradual.

When, however, announcement was made of the additions to the personnel of the firm, the world of art was interested. This interest partook of various forms. With these we need not now be concerned. It is sufficient merely to note the fact since time has proven the wisdom of the selections made.

On January 1, 1906, William Mitchell Kendall, Burt Leslie Fenner and William Symmes

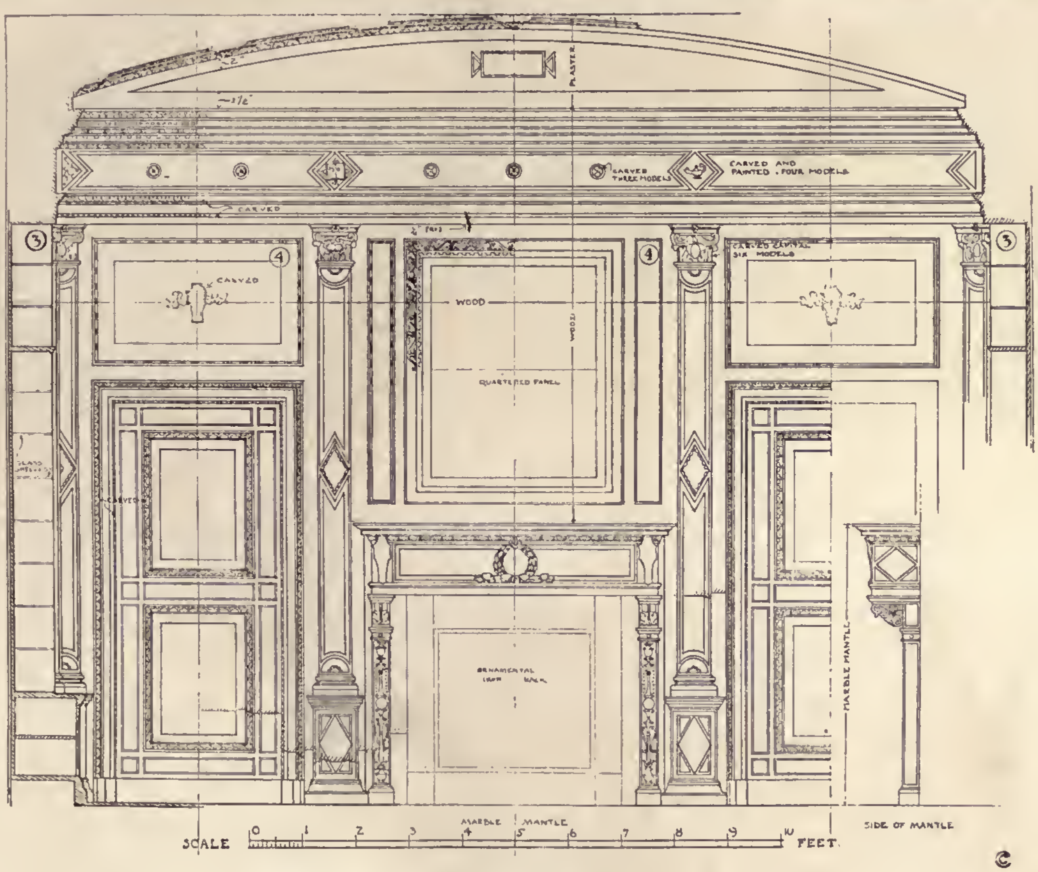
Addition "H"—Metropolitan Museum of Art

its members were cognizant of the fact. It is found in their determination to perpetuate the name and continue the activities that had brought this name into such high repute. Thus, at the height of their attainments, they commenced to consider who should, in the future, be their successors. These men must have the same lofty aims and high business principles that they themselves had. They must be men of proven ability.

*See appended list of names of some of those who have been members of the office.*

Richardson were made partners, followed by Teunis J. Van der Bent and later by Lawrence Grant White.

Kendall had been graduated from Harvard in 1876, had traveled abroad and been connected with the firm since 1882. His intimacy with the original partners and the complete artistic harmony in which he and they had worked together for so many years; the design knowledge which Kendall had contributed during the firm's formative period, and after; these and other assets made




Library for the Hon. Whitelaw Reid, New York (1910) it as logical for him to become a partner as it is for brother to join brother.

Fenner had been a student at the University of Rochester and the Massachusetts Institute of Technology from 1887 to 1891, and had entered the office in the fall of 1891. Fenner's father and Mead had been classmates and close friends at Amherst. What, then, more natural than that Fenner, in the pursuit of his profession, should enter the office of McKim, Mead and White? What more natural than that Mead should take a paternal interest in him and that he should impart to him knowledge which had contributed so markedly to the success of the firm; that under McKim and White, Fenner should develop further knowledge of design already gained by his studies at Technology? The younger man soon proved his ability to shoulder the burden of labor of which the older one gradually divested himself.

Richardson had come from practice in San Francisco and had been in the office since 1895, during which period he had gained the confidence of White who, more and more, entrusted him with important work and continually counseled with him on matters of design. How natural, therefore, that he, too, should become a member of the enlarged firm.

Van der Bent had been graduated from the University of Delft, Holland, in 1885 as an architect-engineer, and had entered the office in 1887. During the time he had been so connected he had contributed great engineering skill. Not alone this; his knowledge of general construction, of planning, of superintending and of designing as well, made him a valued co-worker and a very great asset to the firm at the time of its expansion.

Lawrence Grant White, Stanford White's son, by his very inheritance, was cast for architecture. Under the guidance of his father, even in his early youth, his leaning was unmistakably toward that profession. Graduated from Harvard in 1907, he completed the Ecole des Beaux Arts course, and in 1914 entered the office and was made a member of the firm in 1920.

The American Academy in Rome (1913)

While much of the work done before the expansion of the firm might be properly credited, at least in part, to these men, the work for which Mr. Mead and they are entirely responsible, dates from 1909, when McKim died, White's death ante-dating McKim's by three years.

For several years prior to 1919, Mr. Mead had been gradually transferring his labors to his partners. He had, during that period, as before, been the steadying influence. At the end of 1919 he retired from the firm, still maintaining, however, his interest as consultant and adviser.

And so today the firm of McKim, Mead & White is composed of William Mitchell Kendall, Burt Leslie Fenner, William Symmes Richardson, Teunis J. Van der Bent and Lawrence Grant White, with Mr. Mead as consultant.

The first noteworthy attainments of the new firm were the Municipal Building at Park Row and Chambers Street and the United States Post Office opposite the Pennsylvania Terminal, both won in competition. The Terminal itself had been a subject of preliminary study during the life of both McKim and White. The construction contract was awarded in 1906 and the building was erected under the supervision of the expanded firm. Thus in a comparatively short time the firm showed unmistakably its capability of perpetuating the great name as well as the fame of the firm as originally constituted; then and later proving the wisdom of the original members in their choice of men that were to succeed them.

And what of subsequent work? When we recall some of the earlier work, we are impressed by the classic tendency that pervades most of the designs. So are we impressed when we study an equal number of the best buildings designed after 1909.

Comparison between the two periods reveals little to allow of differentiation. The same scholarly knowledge is evident. The same dignity of design is appreciable. The same conception of scale and proportion is discernible. And we note the same refinement of detail. Instinctively it occurs to one's mind that the same artistic impulses are at work now as at the previous period; that the same spirit of art still exists. No break in continuity is evident between what was and what is. McKim, Mead and White still lives.

Classic influences have always prevailed in the work of this firm. Each example of it is a noteworthy expression of these influences, yet if we study some of the individual buildings designed in other styles we are impressed by the same scholarly understanding which is shown here, also. The Redmond houses are an example. The problem of designing a residence in the French style of Henry II, at the corner of two streets in a great city is fraught with many difficulties. These difficulties are not always apparent after designing has been completed. In fact the finished building should not show them at all. Nor does it in the case in question. (How many, for example, have observed the unequal spacing of windows?)

SALON
House of Percy Pyne, Esq., New York (1911)

The net result is an edifice simple in character, well proportioned and dignified, attesting in every part studious care supported by full understanding of the *motifs* of the period of Henry II.

Another case is that of the Newbold house.

Compare this house with any of similar style (and there are many in the city) and we cannot help noting how well the natural difficulties have been overcome or, if few are recognized in the completed work it is because the result is so eminently satisfactory.

The same general remarks are applicable to the Pyne house which is a noteworthy building among Georgian residences of modern erection.

MUNICIPAL BUILDING

The difficulties of satisfactory solution of the problems involved in the planning of the Municipal Building are best known to those architects who competed for the work.

A comparatively small plot of irregular shape on which was to be erected a very high office building, whose rooms required proper lighting; a building whose principal story would allow of uninterrupted passage of the traffic of Chambers Street, as well as access to subways; a towering building without cellar for the numerous necessary mechanical contrivances of an office building —these and other requirements faced the competitors.

That all these problems are satisfactorily solved is evident, and we have a building of 580 feet to the top of the figure, of superbly monumental character and classic beauty, every part of which attests the architectural knowledge of its designers.

U. S. POST OFFICE BUILDING

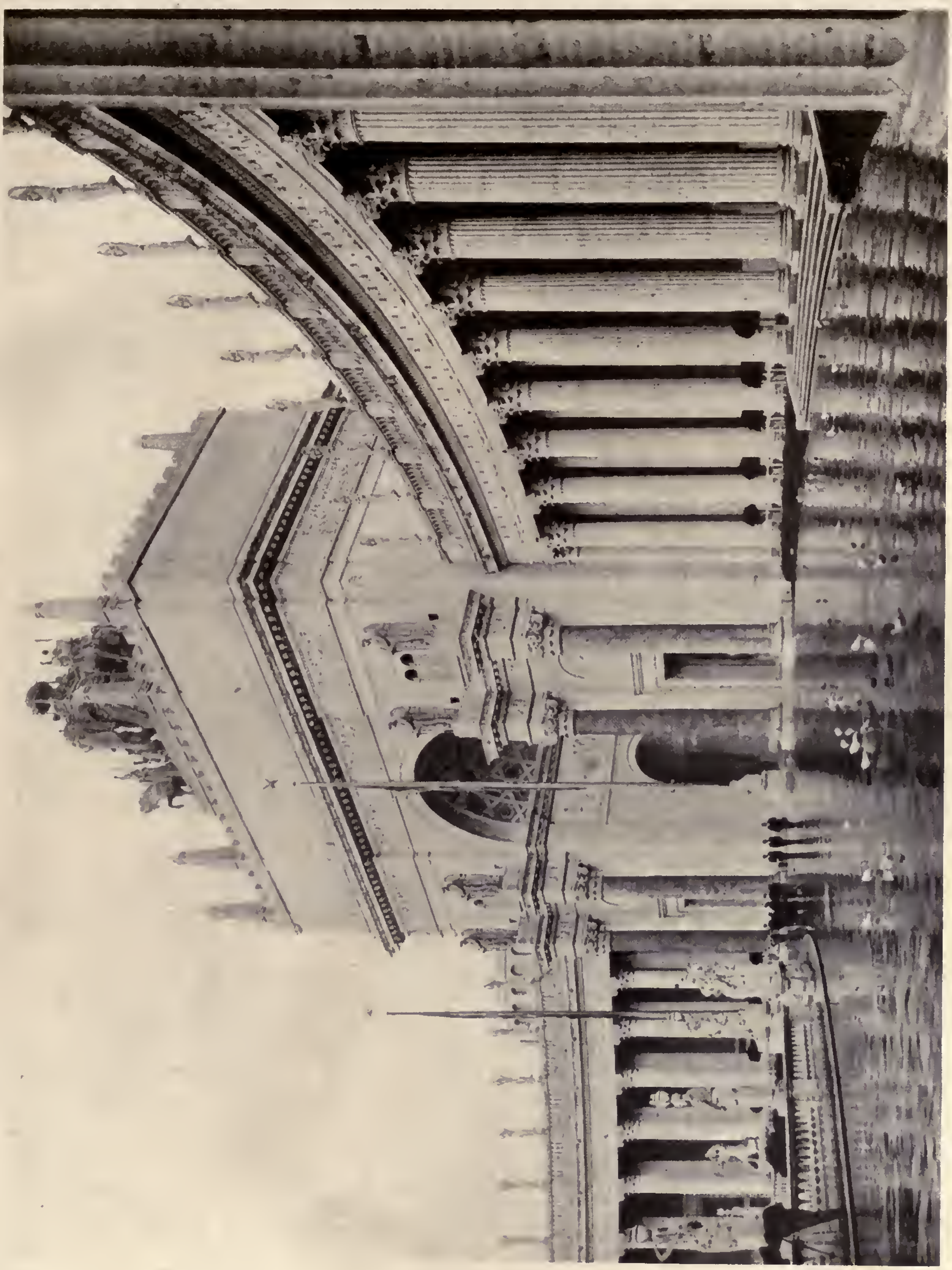
Unless a building of moderate height is large in scale it becomes insignificant when surrounded by skyscrapers. The design of a building, therefore, of any considerable size which is likely to be so surrounded, should be conceived with this important point in view, and its details executed so as to preserve the scale of the conception and a unity of design.

Had the Pennsylvania Terminal been less noble in its proportions, it would be dwarfed by the hotel which towers above it on the opposite side of Seventh Avenue.

What the future has in store for the surroundings of the Post Office Building which faces the Eighth Avenue front of the Terminal, no one knows, but we may rest satisfied that no matter what may be built in proximity, the Post Office, by reason of its noble scale, will always retain the monumental character which should be distinctly associated with the governmental class of buildings.

Harmony, too, with the design of the western facade of the Terminal Building, is one of the essentially successful qualities of this building, the two forming a "center" with which no spot in the city can be compared, the nearest approach to

RECEPTION ROOM
House of Percy Pyne, Esq., New York (1911)



VIEW IN COURT OF THE UNIVERSE, PANAMA PACIFIC INTERNATIONAL EXPOSITION (1915)

McKIM, MEAD & WHITE, ARCHITECTS

comparison being the Seventh Avenue front of the Terminal taken in conjunction with the Pennsylvania Hotel.

A study of the plan of the Post Office is well worth while for by it we note its exact expression in the elevations.

### Pennsylvania Hotel

It is a far cry from the hotels erected a quarter of a century ago to the one completed in 1920 opposite the Pennsylvania Terminal. One notes now how tiresome is the over ornate decoration which was conceived, in former years, as being a hotel necessity; a character without which popular favor could not be obtained, and therefore financial success assured. Little by little the fallaciousness of the idea has become apparent until hotels (as well as residences and, for that matter, buildings generally) become distinguished by reason of their quiet good taste rather than by their elaborateness.

The design problem of the Pennsylvania Hotel may not have been one of extreme complexity but the opportunities it afforded have been used to advantage and the design of the public rooms of this hostelry are well worthy of being taken as standards for other hotels of similar character and moreover it is not unlikely that they will be. The design and arrangement of the mechanical contrivances are worthy of special note. They marked a great step forward in hotel efficiency and have already been used as standards for some of the hotels subsequently erected.

### McKinley Memorial

An appreciation of the McKinley Memorial at Niles, Ohio, requires that attention be drawn to its plan which, for a problem of this kind, is unique. We have here, instead of one important room over another, a library and an auditorium on the same level joined by a colonnade and separated by a Court of Honor, or Atrium, surrounded by a peristyle in the center of which is the statue.

Of the architecture of the edifice little need be specially noted, one cannot help admiring those qualities shown here which seem to be prevalent in McKim, Mead and White's work.

FAÇADE TOWARDS GARDEN

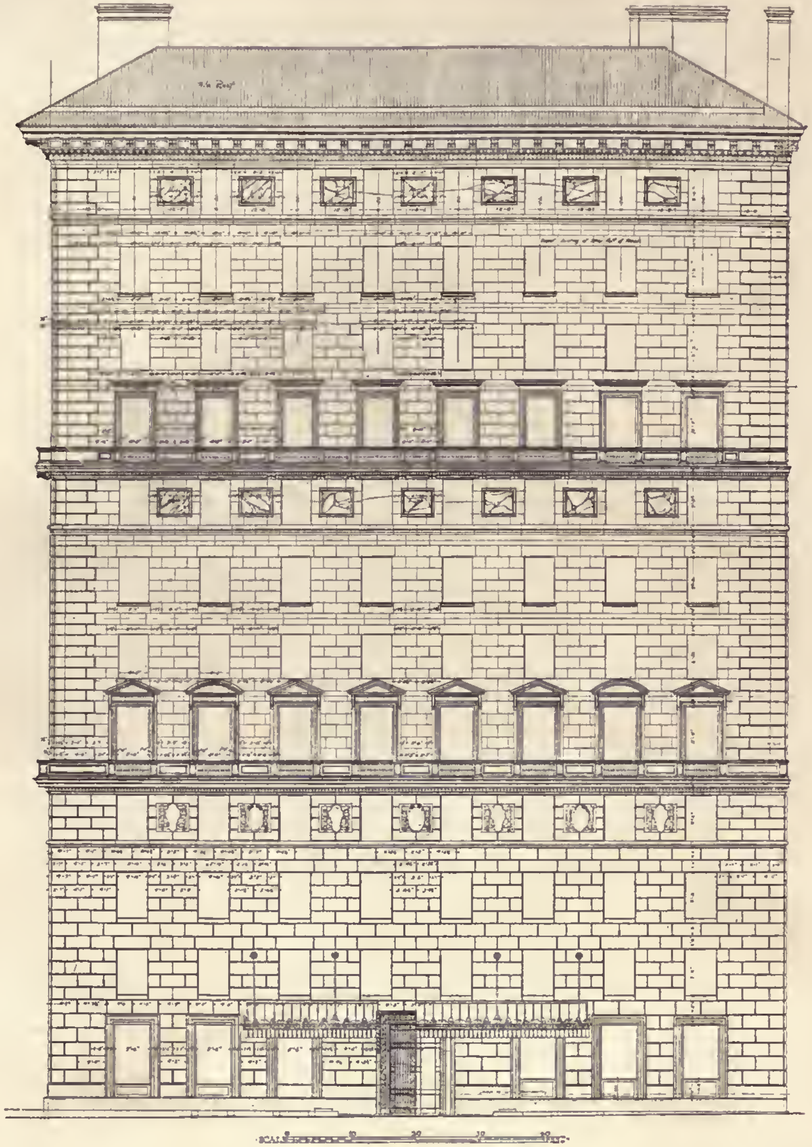
Botanical Museum of the Brooklyn Institute of Arts and Sciences

### Apartment House 998 Fifth Avenue

McKim, Mead and White have repeatedly initiated new eras of architectural design and opened the markets for new materials. One can recall the first modern use of the black headed arch brick and the unevenly shaped brick which were at one time "wasters" of the kiln. These were used in the Harvard Gates by Mr. McKim and to this day are known as "Harvard" brick. Almost immediately after the Harvard Gates became known, architects everywhere made use of this kind of brick. So, too, with light colored brick used first in an apartment house (The Yosemite at 62nd Street and Park Avenue). No sooner was this building completed than here and there, through the city, their use became common.

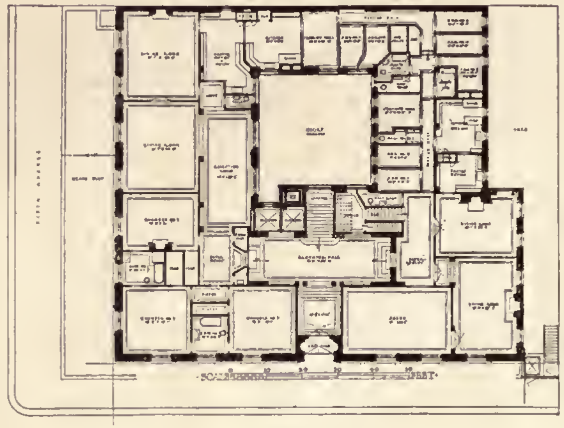
As has been stated, the firm was ever pioneer-

(*Concluded on page* 424)



ELEVATION

TYPICAL UPPER FLOOR PLAN SHOWING SINGLE APARTMENT ON LEFT AND PART OF DUPLEX ON RIGHT



FIRST FLOOR PLAN

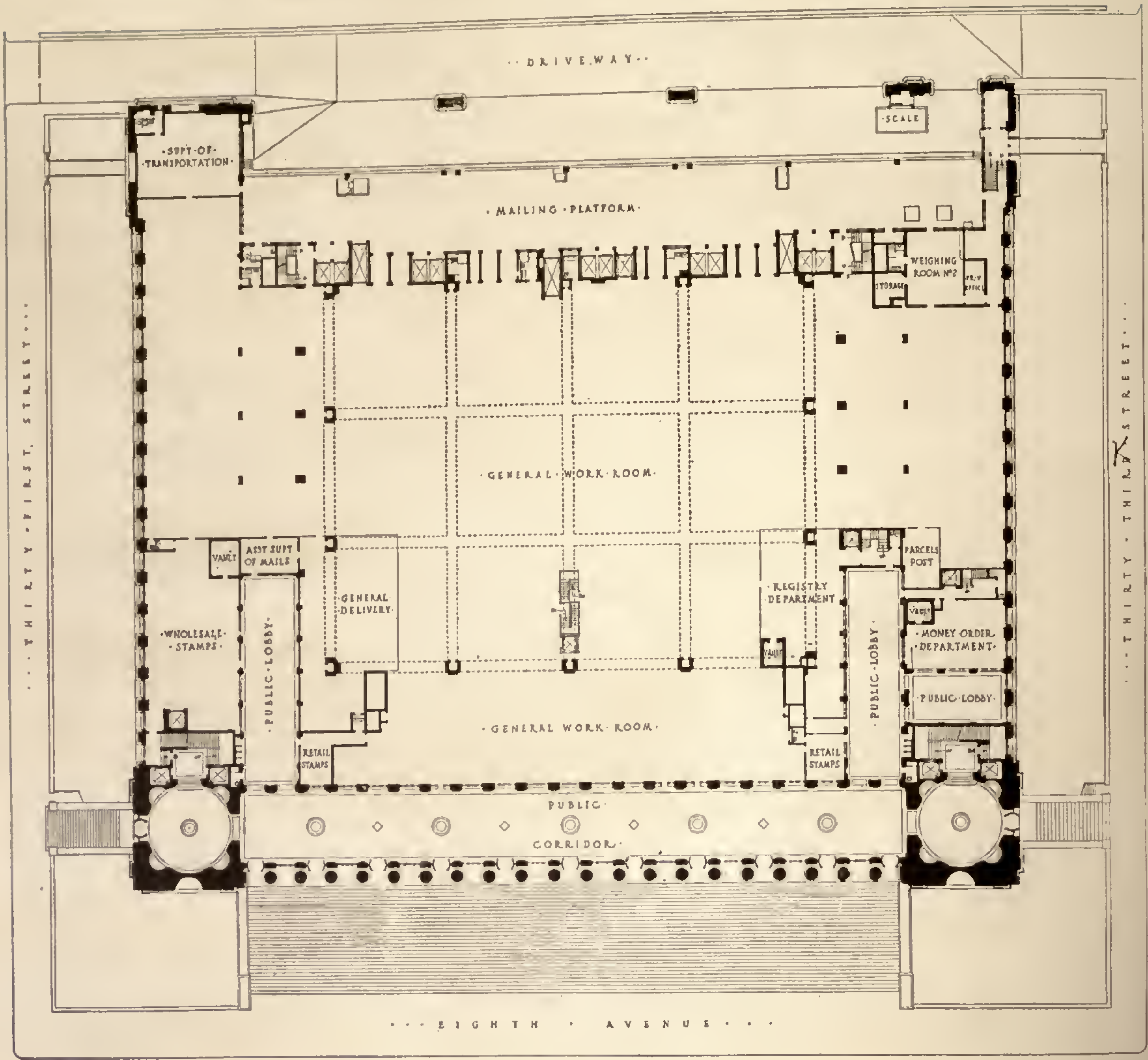
·UPPER FLOOR·

·LOWER FLOOR·

TYPICAL DUPLEX APARTMENT

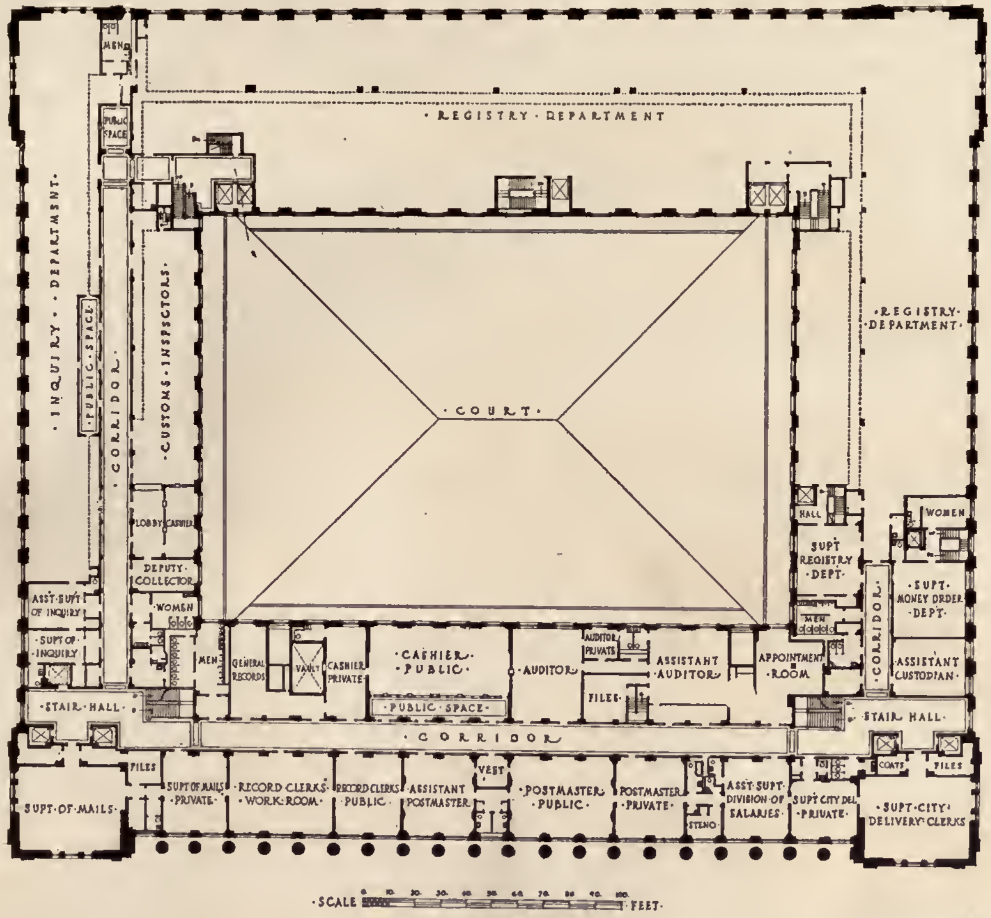
APARTMENT HOUSE, 998 FIFTH AVENUE, FOR THE CENTURY HOLDING CO.
1911

McKIM, MEAD & WHITE, ARCHITECTS (1911)



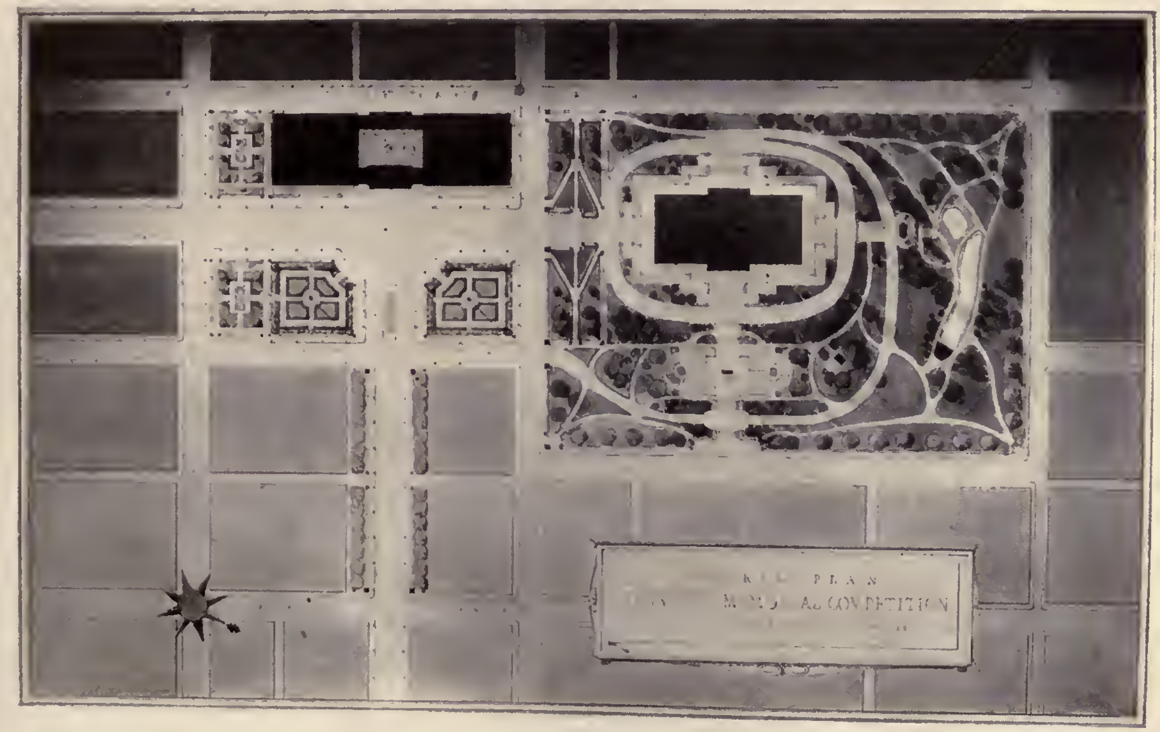

First Floor Plan, U. S. Post Office, New York (1913)

PRINCIPAL ELEVATION
Tennessee Memorial Competition




SECOND FLOOR PLAN

U. S. Post Office, New York (1913)



Tennessee Memorial Competition

**McKim, Mead & White**

*(Continued from page 420)*

ing. Today their work is used freely as examples which others follow, as witness the genesis of a type for the great apartment houses built within the last ten years, so many of which follow the style of that at 998 Fifth Avenue built in 1911 for the Century Holding Company.

TENNESSEE MEMORIAL

An illustration of the proposed Tennessee Memorial shows the latest competition won by McKim, Mead & White in association with Edward E. Dougherty, the decision of the judges having been made in March of the current year. A study of these competition drawings, together with the problem, shows how completely appropriate this structure will be to the requirements presented.

This building is not unlikely to establish a type for similar structures throughout the land.

A complete list of those who have been connected with the office of McKim, Mead & White from 1879 to date would include about 700 names.

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THE following list gives the names of a few whose activities and accomplishments have made them well known in the profession:

Lewis Colt Albro
Louis D. Ayres
Francis H. Bacon
James Brite
William A. Boring
Edward L. Tilton
Henry Bacon
Walter D. Bliss
William B. Faville
Royal I. Cortissoz
John M. Carrere
Thomas Hastings
Edward P. Casey
James Wall Finn
Cass Gilbert
Paul Gmelin
A. D. F. Hamlin
John Mead Howells
Francis L. V. Hoppin
Terence A. Koen
John Galen Howard
Austin W. Lord
J. Monroe Hewlett
Frank J. Helmle
Louis Kamper
Thomas M. Kellogg
W. P. Laird
Harrie C. Lindeberg
Lionel Moses
H. Van Buren Magonigle
William E. Mowbray
Albert Randolph Ross
Philip Richardson
Edward P. York
Philip Sawyer
Gorham Phillips Stevens
Evarts Tracy
Egerton Swartwout
Joseph M. Wells
H. Hobart Weekes
Thomas Wight

# ·EDITORIAL·COMMENT·

THE HISTORY OF McKim, Mead & White, and the illustration of certain examples of work by that firm set forth in this issue need no editorial reference to accent their importance. Wherever the art of architecture is practiced, this firm is known and its great creative ability appreciated. But there are other, and to many, equally important aspects of its place in the history of architecture in the United States, that are not so widely known. One phase, in particular, is of so great importance that the editors of The American Architect set out, as far as might be possible, to make some permanent record of it.

In a series of articles on Architectural Education, printed in recent issues of this journal, Mr. C. H. Blackall, writing of Architectural Offices, made the following statement:

"Up to less than two generations ago the only architectural education available for the student was that afforded by offices, or something corresponding thereto. In the great creative periods of architecture this was enough, and it surely produced some marvelous results, not wholly, of course, due to the simple system employed, but more probably because of the fact that the system was part of the resulting architecture, and the student grew up inevitably in the footsteps of his master and was able to hand down the principles unbroken to his successors. The schools for teaching architecture as such have not been going long enough to demonstrate that they are all that their best friends claim for them, but no one could deny that as an adjunct of the office, it is possible for them to meet a very important function. Our danger in the past and for the future lies in the fact that we are apt to think the schools will do it all and the offices have no obligation in the matter, whereas the real burden of architectural education rests not upon the schools but upon the offices. The more practicing architects can appreciate this and give of their very best to the young men, treating them as apprentices, as equals and as successors, rather than as mere draftsmen, the more surely will we be able to develop real architecture. An institution never developed a school of architecture in the broad sense, and even in this country where schools have taken so prominent a part, the real growth of the last twenty-five years has been through the office. One has only to consider the career and the influence of McKim, Mead & White to see how true this statement is. Probably no other one firm has had such influence on the young men as has been exercised by the organization which bears this name, an organization which was so coherent and united in its aims and methods that the death of two of the principals has not brought any perceptible change in the character of the output, and the young men who have graduated from this office and risen to honors and opportunities in the profession, are scattered over the whole country and afford unquestioned proof that this office is a real training field for the young architect."

It was the foregoing that suggested the desirability of some acknowledgment in permanent form of the great service given by McKim, Mead & White in the education of those architectural students who were so fortunate as to become connected with their office after their university course in architecture. Mr. Blackall has recorded the fact and Mr. Moses has supplied the details.

In view of all these things, this office becomes something more than an association of a group of men engaged in the practice of architecture. It is a national educational institution. It is a post-graduate college, where the architectural student of demonstrated fitness is taken in hand and guided with the finest sense of duty into the path that leads to highest achievement. There is no obligation as to this work, but the splendid tradition established by the founders of this firm have been assumed by their successors and no abatement of effort may be detected.

There is no copyright, no monopoly on so fine a course. Every individual practicing architect may, and undoubtedly should, pursue a similar one. In all art, and particularly the art of architecture, there is rightfully no room for jealousies or fear of competition. The normally constituted artist sees no competition in the far reaching success of his brethren. The master of an atelier is filled with pride when some pupil has achieved a big success. It is the broad man who gathers about him as assistants in his work the best trained group he can command. It is the most perfect results that he aspires to, and he is willing, if he is broad enough, to share the glory of achievement with those who have helped him attain it.

It is not detracting from the work of the men whose names are appended to Mr. Moses' article, to state that the foundations of their successes were laid in this great office. What McKim, Mead & White have accomplished in bringing to the highest perfection the essentials of architectural education, others may attempt and by equally well pursued methods, attain.

And, if such methods are pursued, our architectural schools may, perhaps, as many of them now seem disposed, be purely theoretical in their curricula, and the student find in his post-graduate experience in some office, the essentials that will fit him for practice. Here we have the spirit of the "elder brother," so loudly proclaimed in other fields and so indifferently performed, brought to its highest perfection. And in the minds of men who have finally set forth on their own account to practice architecture after experience in an office where the atmosphere is so highly educational, the rivalry between the memories of their university lives and those of the splendid association in their first years of office life, is so very keen, that each vies with the other in affectionate regard.

* * *

**FOR THE FIRST TIME** in the history of American industrial development the Construction Industry has united all its elements for the common good—manufacturers, labor, and the professional branches—in an effort to raise the standards and efficiency of the industry and improve the service which it renders the public. This movement takes the form of a proposed Construction Council. It brings together for conference, for betterment of understanding and for common action the architects, the engineers, labor contractors, materials manufacturers and dealers, bankers and insurance men—all elements concerned with building work of any description.

It is stipulated that all the work of the proposed Council to be organized must square with the public welfare. So dominant has this idea been in the preliminary conferences that Secretary of Commerce Hoover, seeing the benefits that will result, has taken the responsibility of presiding at the formal organizing meeting in Washington, D. C., June 19 and 20, and Franklin D. Roosevelt, of New York, former Assistant Secretary of the Navy, has agreed to accept the presidency of the organization. The possibilities of the new organization are tremendous.

Instead of thinking of the building of houses as the individual expression of the fancy of the individual citizens, of the building of highways and railroads as merely the means of an industry we call transportation, of factory building and hydro-electric construction as isolated enterprises embarked in by isolated groups of individuals for private gain, we must now think of construction as we do of agriculture, or of mining, or of manufacturing—as one of the great creators of permanent wealth, as one of the foundation stones in our civilization on which our progress is built.

Already indications of this are evident. Construction reports have become equal to crop reports as barometric indicators of the material prosperity of the country. On their rise and fall depends the well-being of millions of our people, the success of great enterprises, the future welfare of our citizens.

The popular belief is that American industry is divided into four basic industries—(1) agriculture, (2) manufacture, (3) transportation and communication, (4) mining and forestry. Such a classification leaves out of consideration, however, what has been demonstrated after investigation to be the second most important industry in the country, namely, construction. When considered from the standpoint of the yearly volume and money involved, this comes second only to agriculture and is among the first of all industries when expressed in terms of labor. Investigation has shown that the number of workers, who together with their families depend upon the construction industry for a livelihood, totals approximately 11,000,000 persons. It was conservatively estimated that 24% of our annual capital accumulation and over 50% of our national savings are absorbed by this great industry every normal year. Approximately nine-tenths of all iron, copper and zinc and 95% of all the lead produced in this country are consumed in construction.

The way has been well prepared for the great national movement now launched. Nearly every one of the 250 national associations in the industry has tested out its own work and learned from experience the large amount of duplicate effort and its inability to grapple effectively with the problems that extend beyond its special field. They are ready and eager to have these common problems taken over by an all-embracing organization so that there may be the elimination of duplication and more resultful work. They appreciate that the public demand will no longer wait and that only through a broad, virile and effective movement, dedicated to the improvement of the service which construction renders the community, states and nation can the industry gain public confidence. Through co-ordinated action there is opportunity for tremendous waste elimination, assuring to the public the very best returns for their construction expenditure.

Some of the associations engaged in the organization work have been the American Institute of Architects, the Federated American Engineering Societies, the Building Trades Department of the American Federation of Labor, the Associated General Contractors, the National Federation of Construction Industries, the National Building Congress, the National Association of Building Exchanges, the Building Trades Employers' Association, besides a large number of associations of manufacturers.

With this strong backing the American Construction Council should quickly be able to play an important part in the industrial life of the nation. The time is most propitious for action.

THE AMERICAN ARCHITECT--THE ARCHITECTURAL REVIEW
VOL. CXXI, NO. 2394 MAY 24, 1922

THE MUNICIPAL BUILDING, NEW

UNITED STATES POST OFFICE, NEW YORK (1913)

McKIM, MEAD & WHITE, ARCHITECTS

426²


DETAIL, U. S. POST OFFICE, NEW YORK (1913)

McKIM, MEAD & WHITE, ARCHITECTS

HOTEL PENNSYLVANIA, NEW YORK (1920)

McKIM, MEAD & WHITE, ARCHITECTS

MINNEAPOLIS MUSEUM OF FINE ARTS (1914)

McKIM, MEAD & WHITE, ARCHITECTS


THE NATIONAL McKINLEY BIRTHPLACE MEMORIAL, NILES, OHIO (1915)

McKIM, MEAD & WHITE, ARCHITECTS

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BUTLER ART INSTITUTE, YOUNGSTOWN, OHIO (1917)

McKIM, MEAD & WHITE, ARCHITECTS

4267

AVERY BUILDING, SCHOOL OF ARCHITECTURE, COLUMBIA UNIVERSITY (1912)
McKIM, MEAD & WHITE, ARCHITECTS

4268

KENT HALL, SCHOOL OF LAW, COLUMBIA UNIVERSITY (1910)

McKIM, MEAD & WHITE, ARCHITECTS

426[10]

MAIN ENTRANCE AND ADMINISTRATION BUILDING

THE BURKE FOUNDATION HOSPITAL FOR CONVALESCENTS, WHITE PLAINS, N. Y. (1914)

McKIM, MEAD & WHITE, ARCHITECTS

HOUSE FOR GERALDYN REDMOND, ESQ., AND THE COUNTESS
DE LAUGIER VILLARS, NEW YORK (1914)

THE RACQUET AND TENNIS CLUB, NEW YORK (1917)

McKIM, MEAD & WHITE, ARCHITECTS

426 12

13
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HOUSE OF PERCY PYNE, ESQ., NEW YORK (1911)

McKIM, MEAD & WHITE, ARCHITECTS

BUILDING FOR THE AMERICAN ACADEMY IN ROME (1913)

McKIM, MEAD & WHITE, ARCHITECTS


BANK OF MONTREAL, WINNIPEG BRANCH, WINNIPEG, MANITOBA (1911)

McKIM, MEAD & WHITE, ARCHITECTS

426 15

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426


McKIM, MEAD & WHITE, ARCHITECTS

(*Now under construction*)

# STAINED GLASS — 1. THE MAKING OF A WINDOW

BY JOSEPH G. REYNOLDS, JR., Craftsman

THE origin of the making of glass is so remote as to be lost in the mists of legendary days. But the painting and the making of stained glass windows is comparatively a new art, belonging wholly to the Christian Era. It developed along with and as a part of Gothic architecture, until under the patronage and protection of the Church in the Middle Ages, the art speedily reached a high state of perfection.

Many theories have been advanced to account for the origin of the idea of using stained glass in windows. But in all the study that has been given to early work no gradual development from crude beginnings has ever been traced. Indeed the very oldest windows dating from the eleventh and twelfth centuries are today the most beautiful in existence. This fact tends to show that the necessary development probably took place in another craft, and the knowledge thus gained was then made use of in this one.

Fig. 1. Early Limoges Champlevé enamel plaque, from the Metropolitan Museum of Art

Mr. Westlake in his "History of Design in Painted Glass" develops a very plausible theory that the first stained glass window was inspired by the early enamels. Almost every one knows what a cloisonné enamel plaque is. Upon a copper base are soldered copper wires in some sort of a design. The spaces between the wires are filled with opaque colored enamel, and the plaque is fired in a kiln. Place this cloisonné plaque upright against the light, substitute lead for the copper wires, use transparent for opaque glass and you have a stained glass window.

Whether the theory that this is the prototype of the stained glass window is correct or not, certain it is that a very close relation existed between the enameler's craft as practiced at Limoges, France, and the craft of the mediæval glazier. The accompanying illustrations show the Baptism of Our Lord. One is an early champlevé enamel plaque now in the Morgan collection of enamels at the Metropolitan Museum of Art, New York, (Fig. 1), and the other, a medallion from the twelfth century great central west window in the Cathedral at Chartres, (Fig. 2). The composition, the drawing of the figures and details and especially the naive arrangement of the river Jordan—in which Christ is standing waist deep, while Saint John the Baptist and the Angel remain dry shod—are strikingly alike.

Briefly stated, a stained glass window is a mosaic of pieces of colored glass firmly held together in their correct positions by strips of grooved metal called leads.

Literally, stained glass is glass that has been colored in the making, not by the craftsman who constructs the window, but by the maker of the glass itself. The color is produced by the admixture of various metallic oxides in the molten mass while it is "in the pot," to use the technical phrase; hence the term "pot-metal" glass. Again painted glass, whether stained or white, has had an opaque pigment painted upon its surface and then has been "fired" or burned in a kiln. It should be borne in mind that the pigment is employed merely for giving detail and stopping out light where desirable, and not to give color.

Fig. 2. Twelfth Century Medallion from the great central West window in the Cathedral at Chartres

A visit to the studio of a glass worker is of unusual interest in this commercial age of ours, for this ancient craft is one of the few examples of the all but vanished crafts in which no machinery is used in the processes of manufacture.

After going through a glass worker's studio the wife of an eminent sculptor was heard to remark that it seemed as though she had almost stepped backward into mediaeval times. She found there a spirit of friendly co-operation, an earnest desire on the part of each worker to contribute the best artistic efforts of which he was capable, and a joy in the work. These factors, she said, are very strongly suggestive of the mediaeval guilds.

Then, too, the methods employed in the workshop today are essentially the same as they were in the Middle Ages. The mediaeval worker drew his cartoons on the work bench in charcoal or chalk. We today make our full sized drawings with charcoal on heavy white paper. He cut his glass by drawing a red hot iron across the sheet and then snapping it in two pieces by gripping it with both hands and exerting pressure. He then shaped the piece by chipping it with a "grozing" iron. We cut our glass by means of a diamond or a steel wheel and shape the piece accurately by "grozing" with pliers. The ancient craftsman planed his lead by hand or molded it. We moderns buy ours from a manufacturer who mills it out or forces it through a die. He heated his soldering iron in a charcoal flame. We heat our irons by attaching a cord to the electric light socket in the same way that the modern housewife heats her electric flat iron.

Fig. 3. Drawing the cartoon

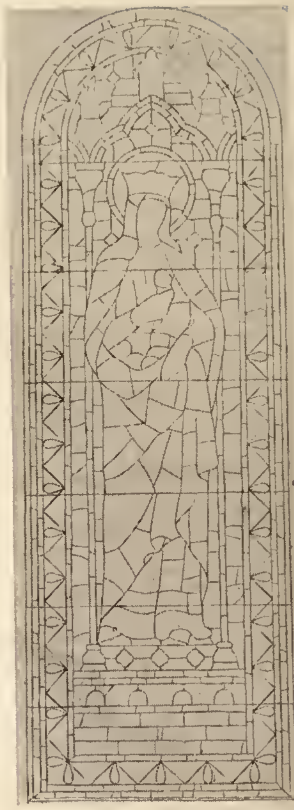


Fig. 4. Cut-line or working drawing

Let us, then, see how a window is made, and trace, by the aid of illustrations, its development from the time the order is given by the client, until the window is completed.

In the first place the design is drawn to scale and rendered in water color, the idea being to give as true and complete an impression as possible of the actual appearance of the window when finished and set in its final position.

The design having been drawn and approved by the client and the architect, the cartoon is next made. This is drawn to the actual size of the window opening and the leads, bars, and all details of the finished window are carefully planned. (Fig. 3).

From the cartoon, these lead lines and bars are reproduced in a tracing called the "cut-line" or working drawing. (Fig. 4). Next the cut-line is laid on the pattern paper with a sheet of carbon paper between. Then by going over each line with a hard pencil or stylus, an exact duplicate of the cut-line drawing is transferred to the pattern paper, and the pattern drawing is cut into separate patterns by the aid of a double-bladed knife which takes out an allowance for the "heart" of the lead, as that portion of the lead is called which lies between the "shapes" of glass.

The visitor often wonders how it is possible to keep track of all the pieces of glass, since in a large window there are hundreds, or perhaps thousands of separate pieces. This is accomplished by numbering the patterns and the cut-line drawing correspondingly so that in this way the "picture puzzle" is amazingly simplified.

The next step in the process is selecting the glass, or, as it is technically termed, "coloring" the window. With the original design as a guide, ruby, blue, green, gold, violet, and white glass of varying tones of intensity and value are selected (Fig. 5) and cut to the shapes of the patterns with a diamond or a steel wheel. (Fig. 6).

Each piece of glass is now placed on the cartoon and the detail is traced upon the glass with an opaque, vitrifiable pigment. This pigment is composed of peroxides of iron and manganese ground up with powdered flint glass or an equivalent silicate, and mixed with varnish or fatty turpentine to cause it to adhere.

The "shapes," or pieces of glass, are now assembled on a large plate glass easel beneath which lies the cut-line to serve as a guide; to this plate they are fastened by dropping a mixture of melted wax and resin at the corners of each separate piece. This process is called "waxing-up." The easel is now placed upright in a location where direct daylight will shine through, so that at last we have the first view of our colored, mosaic window. Obviously the light will shine through the cracks left between the separate pieces of glass, giving a false idea of values; for this reason the next step consists of painting out these white lines on the back of the plate glass with an opaque paint, a mixture of oil and lamp black. For the time being these lines take the place of the leads that will appear in the finished window.

Fig. 5. Selecting the Glass

Now the supplementary painting begins. (Fig. 7). Each piece of glass is covered with a thin film or "matt" of opaque pigment—the same kind of vitrifiable pigment that was used for tracing the outlines of the details, but now the adhesive medium is gum arabic instead of varnish, and the paint is thinned with water. When dry, this "matt" is rubbed with the finger or scrubbed with stiff bristle brushes until most of the pigment is removed, leaving just enough to give a more effective texture to the glass, mellowing the color without sacrificing any of its intrinsic beauty and brilliancy.

Fig. 6. Cutting the Glass

This process of painting completed, the easel is laid flat on a bench and the pieces of glass are "chipped off," that is, loosened from the plate. They are now put in the kiln or furnace and the heat gradually raised until the glass attains a cherry red. The surface is now in a molten state with the pigment that was painted on becoming fused into the very glass itself. The heat is then gradually reduced until the glass is cool enough to be safely removed. Once more the pieces are assembled on the plate glass easel and waxed up, and the window is again placed against the light. It will now be found, as had been expected, that the opacity of the film of pigment has been reduced about fifty per cent by the firing. In some cases the paint has been reduced still further or may even have burned away entirely. These will need retouching and are put through the kiln a second time. When this is done the glass is ready for the glazier.

All the pieces are now assembled on the cut-line drawing and the process known as "leading-up" begins. (Fig. 8). Two laths are nailed at right angles to each other on the bench and two wide leads, called binding leads, are laid alongside them. The piece of glass belonging in the corner at the glazier's left hand is inserted in the binding leads and another lead fitted to its free side. The next piece of glass fits into this, and so on until the whole panel is complete—a mosaic of pieces of glass separated and yet held together by leads. The leads are soldered at the joints, then the panel is turned over and the soldering completed on the reverse side.

Now the window is ready for the final process, cementing. A water-proof cement, composed of whiting, Portland cement, boiled linseed oil, turpentine, lamp black, and Japan dryer, is applied to each side of the panel of leaded glass and thoroughly worked under the leads. This process

Fig. 8. "Leading-Up" or Glazing
The pieces assembled on the cut-line Drawing

Fig. 7. Painting the Glass

finished and the cement given due time to harden, the window is ready to be set in place for final inspection (Fig. 9) before being boxed and shipped to the building where it is to be installed.

This, then, is a very brief outline—a bare statement of the main facts — of the processes employed in making a stained glass window. In two succeeding articles we shall take up a comparative study of the history of design, from the earliest glass of the late eleventh century to that of modern times. This brief study in design will be accompanied by photographs depicting the salient characteristics, and an explanation showing

Fig. 9. The finished Window

the relative artistic merits, of each period. We shall likewise consider the aims and ideals of the present day worker in the craft, studying the tendencies in style that influence him, the problems confronting him, and the possibilities for decorative use of stained and leaded glass in our modern buildings.

*(To be continued)*

# AMERICAN ARCHITECTURE*

BY JOHN M. LYLE

I AM going to try to give you some idea of the great American Renaissance in Architecture which has been in full swing now for the past fifty years. I want also to tell you something of the architects themselves, many of whom I am fortunate in knowing personally.

You must bear in mind, however, that the opinions I shall express to you are purely personal and not in any sense dogmatic, for it is a great mistake to be too dogmatic in matters of taste. One must always remember that taste is an ever-changing factor, and that no two persons will agree as to what constitutes good and bad taste.

Taste and charm in architecture are qualities that are difficult to define, and must be felt to a large degree. They are, however, noticeable qualities in the work of all great architects.

I should like to urge on you all the great importance of cultivating the æsthetic side of your education; much of this you must get for yourself entirely outside of your practical and technical studies in the University or in the office.

This is doubly important for the Canadian student, because he has not the advantage of the European student in being able to see masterpieces of architecture, painting and sculpture staring him in the face at every turn.

How, you ask, is he going to form a standard of taste without going abroad?

My advice to him is, that given a certain amount of natural liking for the beautiful, he can, by study of the most interesting and fascinating kind, acquire a standard of taste that will be invaluable to him in his future career, and moreover he can continue his studies along these lines until he is ready for the grave.

He must learn of painting and painters, of sculpture and sculptors, of stained glass, of tapestries, of furniture of the different periods, of china, of silver, in short, of all *objets d'art*. It is a life study, but an entrancing one. He must read books on these subjects and books on the lives of the men who worked the masterpieces of the past.

He should not fail to go to the picture galleries, the Museum here should be an open book to him.

It is a well known fact that one often lives and works in the midst of some great political or artistic movement, without really appreciating just what is going on.

That the United States has been going through a great renaissance in architecture during the past fifty years, is just now being recognized abroad. In my opinion, the work that has been turned out by the American architects during this period, far outshines that of any other country during the same time.

Rupert Brooke, the English poet, said some ten years ago that he placed among America's five greatest achievements her modern architecture. A writer in *Country Life* remarks that "Anyone who has visited America recently will realize that if magnificent modern architecture ten years ago was one of the five finest things she has produced, this architecture has now probably reached the first place."

We now find English architectural students coming over to McKim, Mead & White's office for summer office experience.

What are the outstanding features of American architecture?

1. Its scholarship. 2. Its solidity and simplicity. 3. Its restraint. 4. Its execution. 5. Its handling of monumental work on a big scale.

Dealing with the first—its scholarship—there is no question but that the training of the American architect has had a great deal to do with the success that has attended his efforts in solving the various problems that have come before him. Following the French, rather than the English methods of architectural education, he has learned how to study, how to attack a problem, and the great success of the American designer in solving problems and in using different styles, is largely due to his education.

While it is true that they have had unequalled opportunities, it must not be forgotten that the designers have risen to them and are primarily responsible for American architecture.

Very many of the foremost American architects are graduates of American universities, and have

* *Synopsis of an address delivered before the Toronto Architectural Club.*

supplemented their American training by a European one, principally at the Ecole des Beaux Arts. I cannot remember a single American who was in France at the same time I was, who was not a graduate of Yale, Harvard, Princeton, Columbia, or some other university. These men spent anywhere from three to six years at the Beaux Arts. It was always a source of wonder to me how many of them could speak two or three languages. All were deeply interested in architecture and had their weather eye always open for a bargain in the antiques.

Second—Its solidity and simplicity. These are undoubtedly two marked qualities noticeable in American architecture.

The American architect seems to have caught something of Sir Christopher Wren's spirit, who believed that architecture should have the attribute of the eternal and that the "little knacks" should be avoided.

The buildings seem to be made up of a few parts rather than of an infinite number of small parts, or in other words, they are well studied, well composed, with a consolidation of ornament and a simple treatment of wall surface, depending on their scale and proportion for much of their beauty.

Third—The restraint, noticeable in the best American work, is very patent when you compare it with corresponding English, French or Italian work. A building may be well proportioned and well composed as to mass, but if it is plastered indiscriminately with ornament, then the abuse of this legitimate device defeats its own object, even if the ornament be good in itself.

Fourth—The execution of the American work is of a very high order. I do not think that any country can show such a high standard of excellence as that of McKim, Mead & White, and this is also true of the work of many other firms.

I would give special credit to McKim, Mead & White for this reason, that they have always insisted on the highest possible standard in their stone work, brick, plaster, wood and iron work; picking their contractors, who, it is well known, always figured high on their jobs, for they knew that none but the best work would be accepted.

Their influence has been one of the great factors in establishing a high standard of workmanship, ably supported by the younger men of today.

The great works that have been under way in the United States have naturally attracted many of the pick of the world's craftsmen. I know of several jobs where special workmen were brought from England, France and Italy for particular work.

Five—There are only two groups of architects who have attained a marked degree of eminence in the handling of monumental problems—they are the French and the American; the Italians have never grasped the fundamental idea in monumental work, which is so closely related to planning. I am not referring so much now to monumental buildings as to large developments involving group planning.

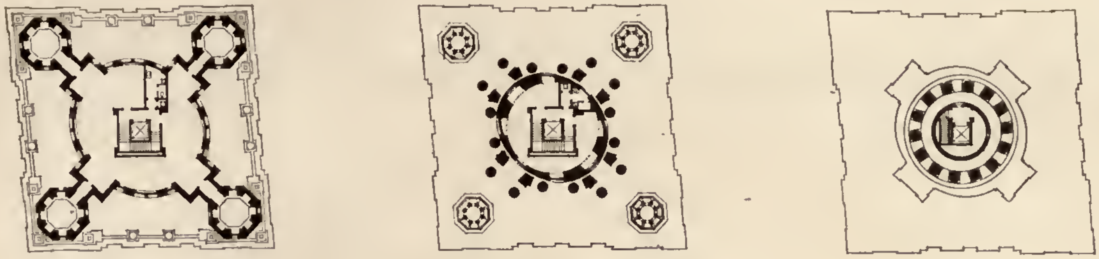
The Italian, of course, has given us some of the greatest individual monumental architecture of all time, but he rarely had that sense of placing a building or buildings so that they would count—at the head of an avenue, or to form the sides of a square. True, that Bernini's Colonnade, and Michael Angelo's wonderful Conservatore Group are masterpieces, but they are the exception. Many of the greatest buildings in Italy are lost by reason of their setting.

In the designing and handling of individual buildings of a public or monumental character, the American architect has shown great skill. True that one can often trace the influence or source of inspiration, whether Italian, French, English or Spanish, of much of the work; nevertheless, there is much personal feeling, resulting in an architecture which is distinctly American. They have realized that the bizarre and picturesque touch which may be so delightful in a small country house, is an absurdity on a bank or court house. They seem to have had the job in mind rather than the desire to use some particular piece of ornament or pediment to the detriment of the design.

To quote from T. B. Bennett: "Great architecture has in all periods seized upon the requirements of its client and by natural expression has transformed them into works of art. It has always frankly accepted the limitations of site, material, cost of construction, and used them as a means to an end."

"The ability of the American designer to seize upon and emphasize the essentials of his problem is noteworthy, a chapel, a bank, a library, or an office building, all indicate clearly their special purpose."

The essentials of American architecture can be defined in a few words, as the work of men of taste who have added knowledge to their ability.

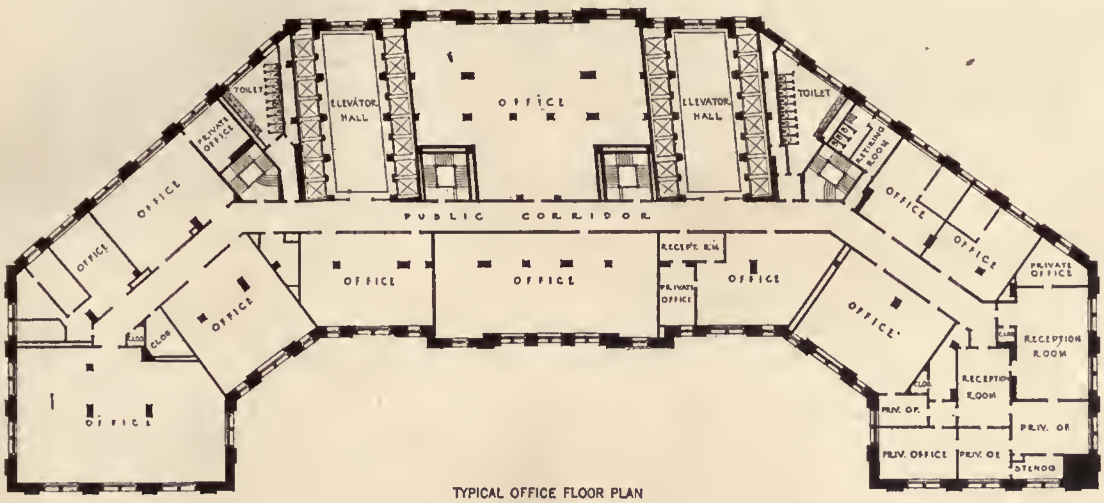


28TH FLOOR

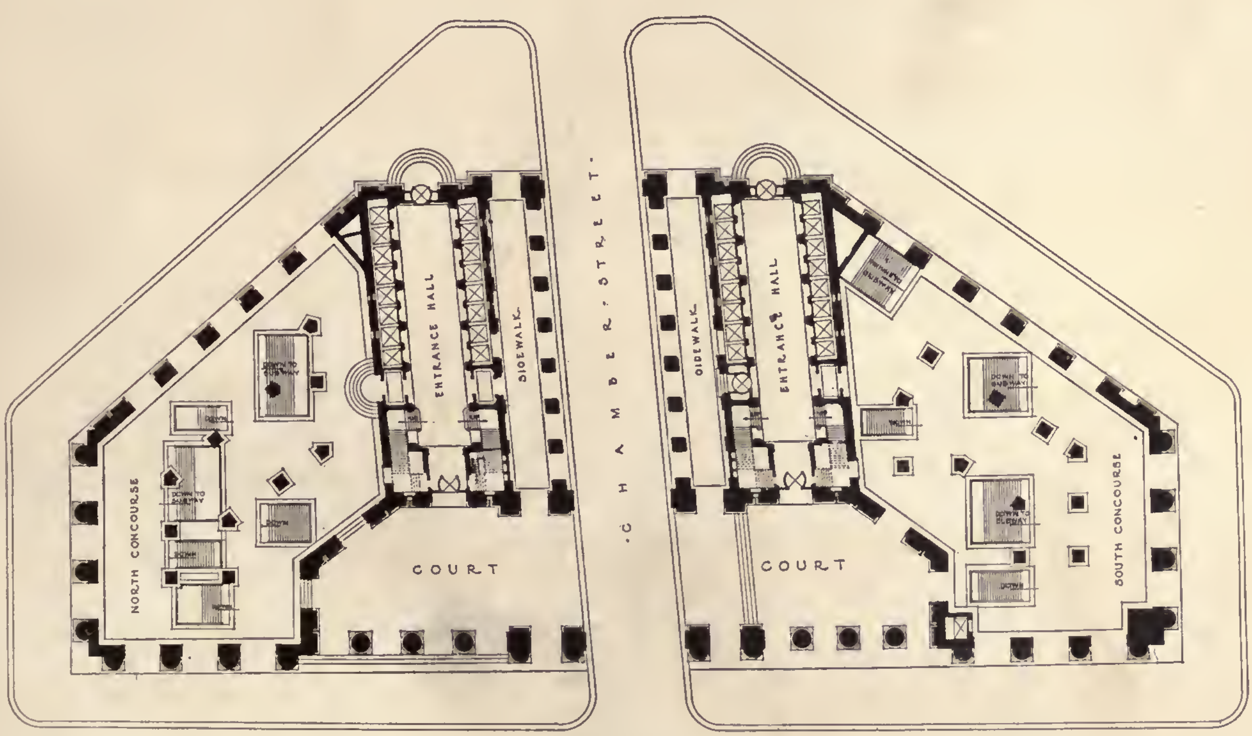
32ND FLOOR

36TH FLOOR

PLANS OF TOWER




TYPICAL OFFICE FLOOR PLAN

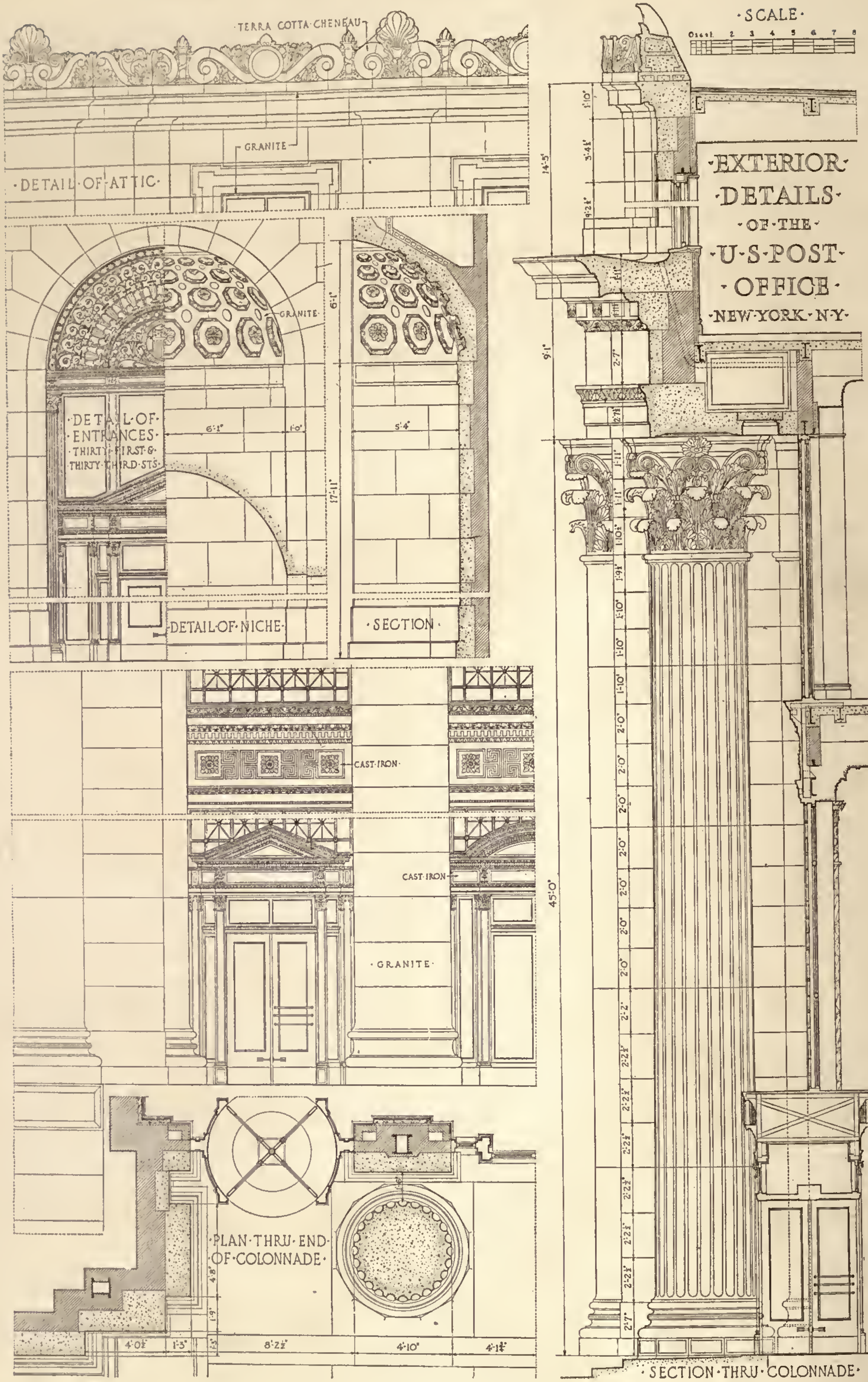



GROUND FLOOR PLAN

·SCALE 0 10 20 30 40 50 60 70 80 90 100 FEET·

THE MUNICIPAL BUILDING, NEW YORK (1908)

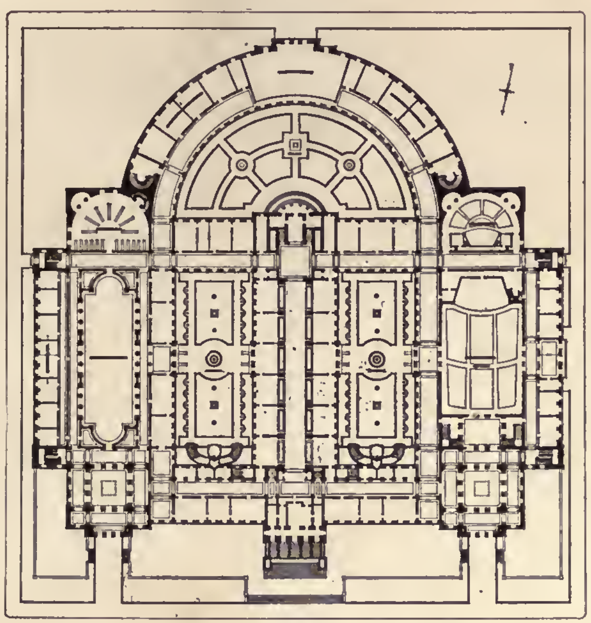
McKIM, MEAD & WHITE, ARCHITECTS



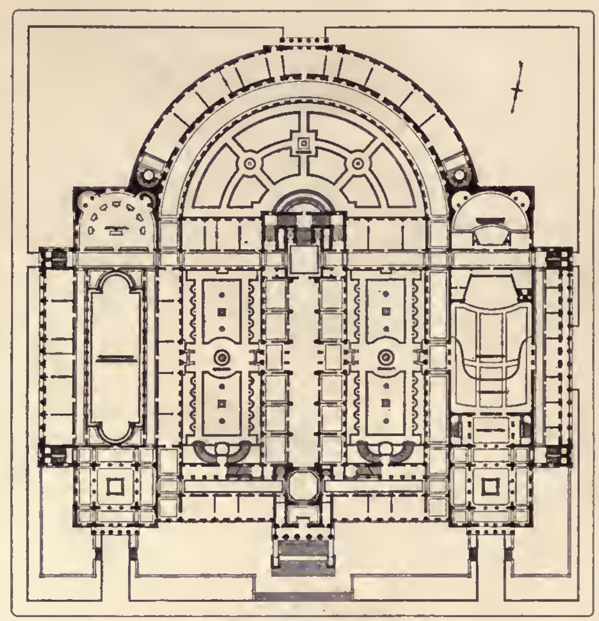

U. S. POST OFFICE, NEW YORK (1913)

McKIM, MEAD & WHITE, ARCHITECTS

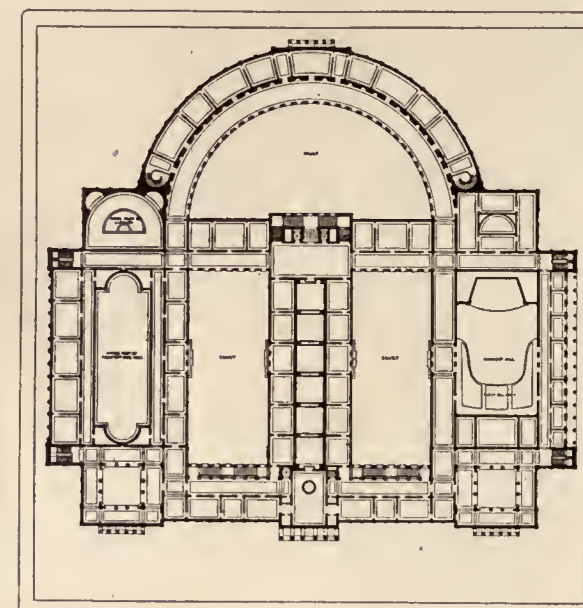

ELEVATION OF CENTRAL PORTION NOW BUILT



BASEMENT PLAN



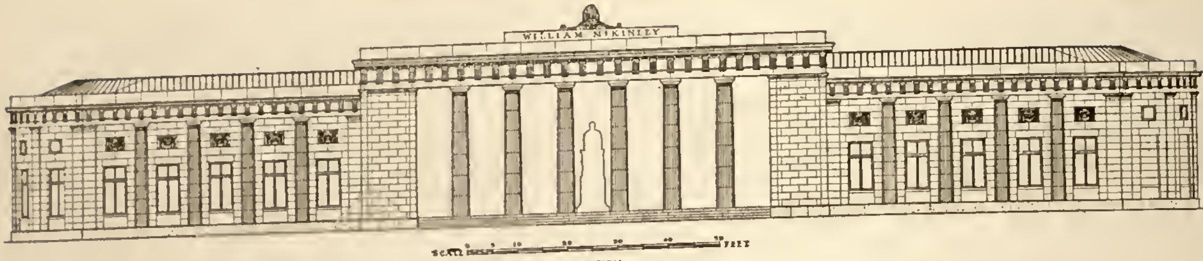

MAIN FLOOR PLAN



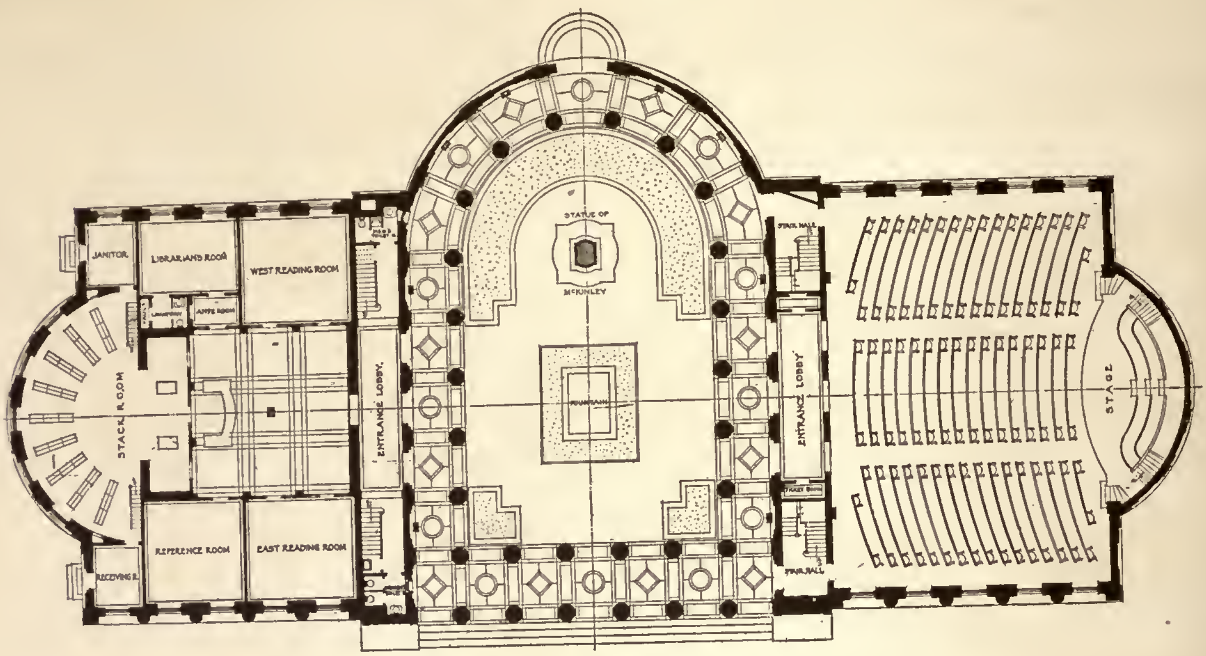
SECOND FLOOR PLAN

THE MINNEAPOLIS MUSEUM OF FINE ARTS (1914)

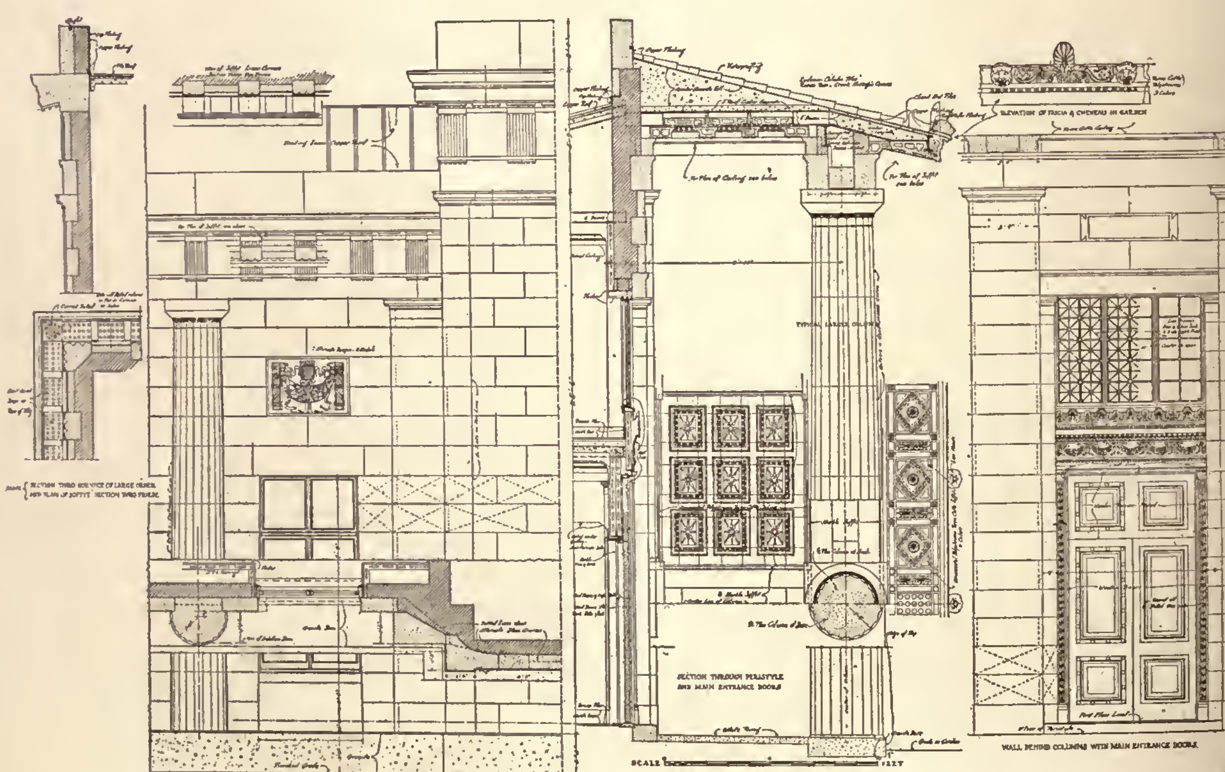
McKIM, MEAD & WHITE, ARCHITECTS




ELEVATION




FIRST FLOOR PLAN

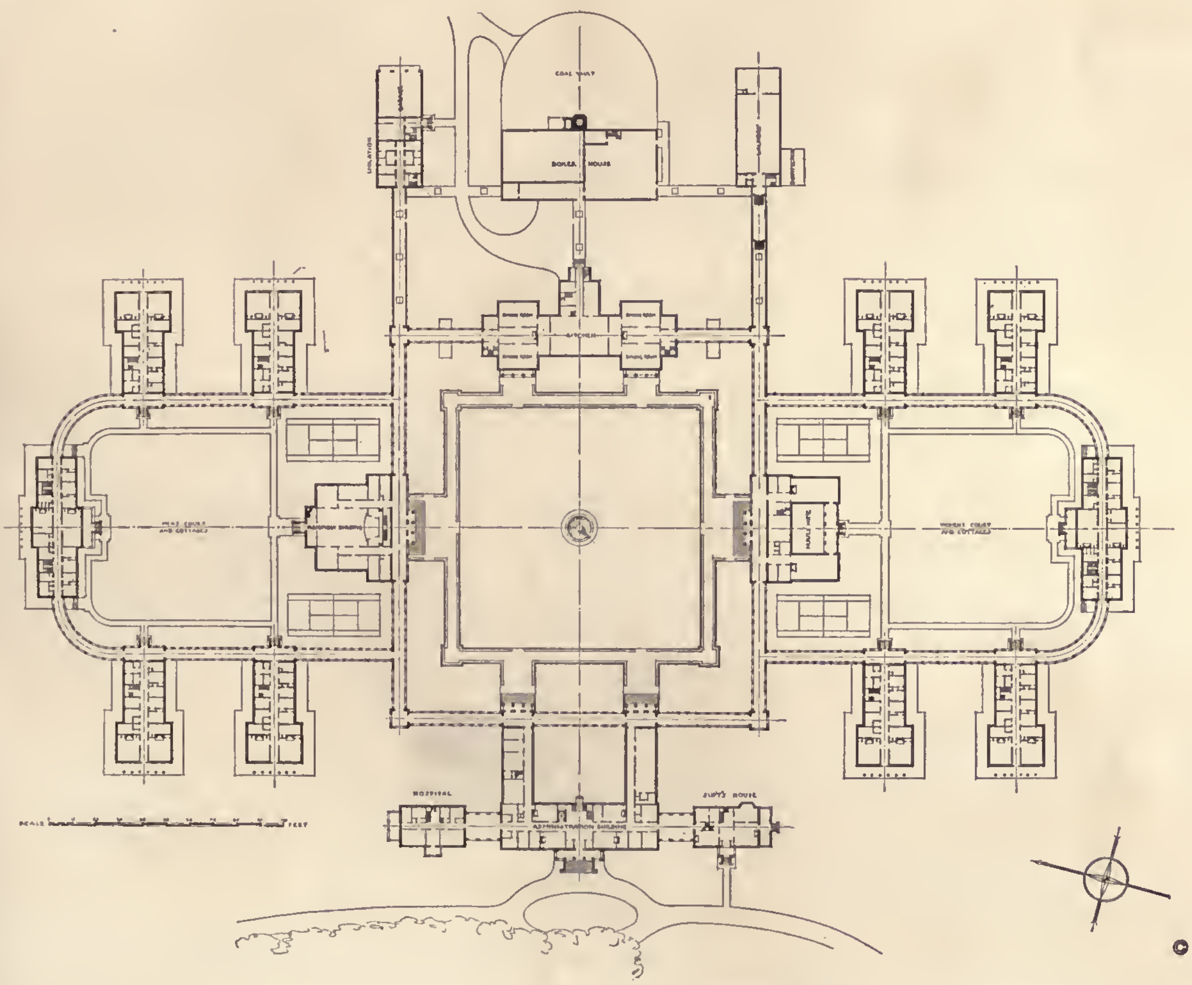



THE NATIONAL McKINLEY BIRTHPLACE MEMORIAL (1915)

McKIM, MEAD & WHITE, ARCHITECTS

COURT ELEVATION OF ADMINISTRATION BUILDING.

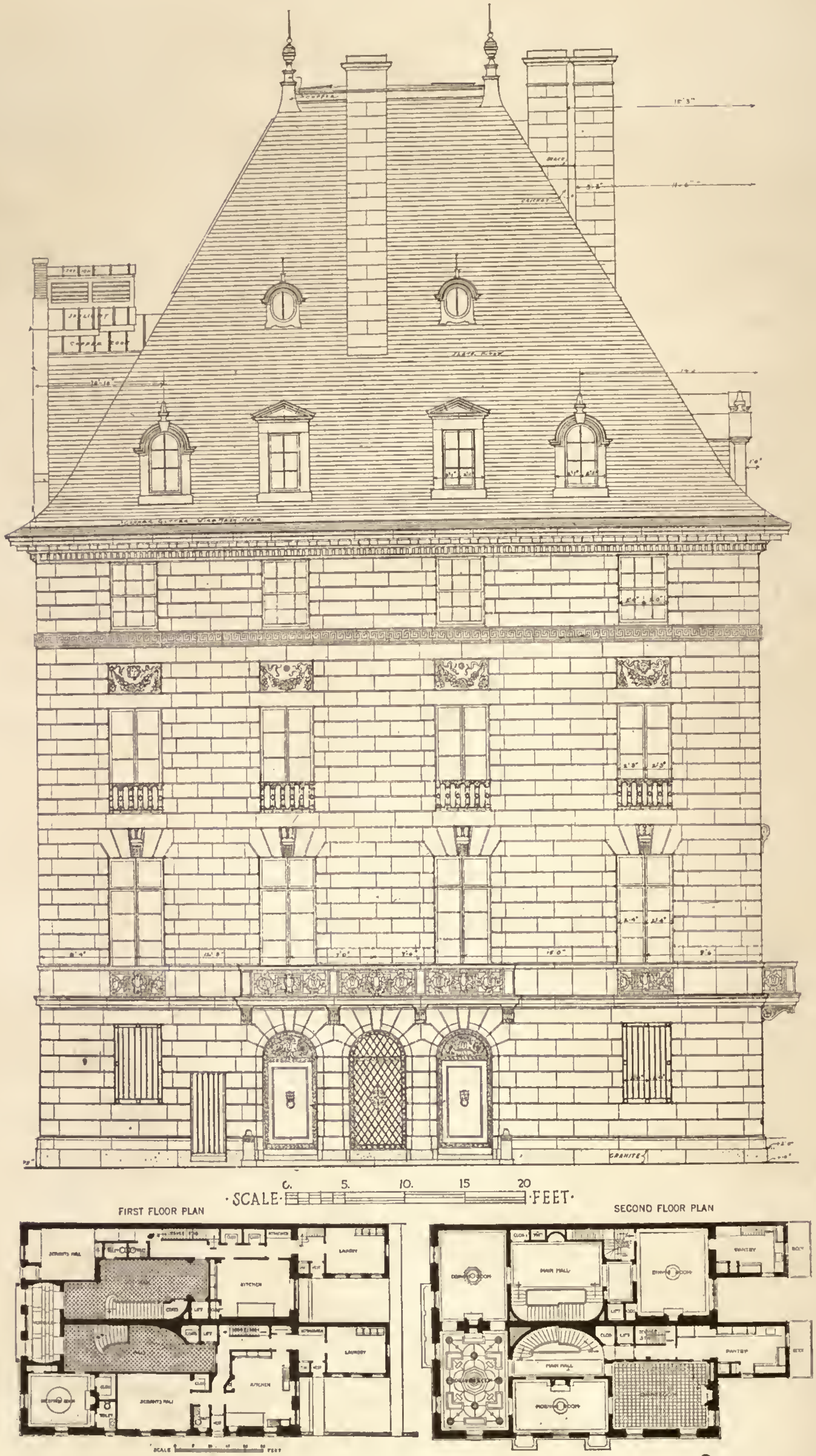
COURT ELEVATION OF DINING HALL BUILDING.



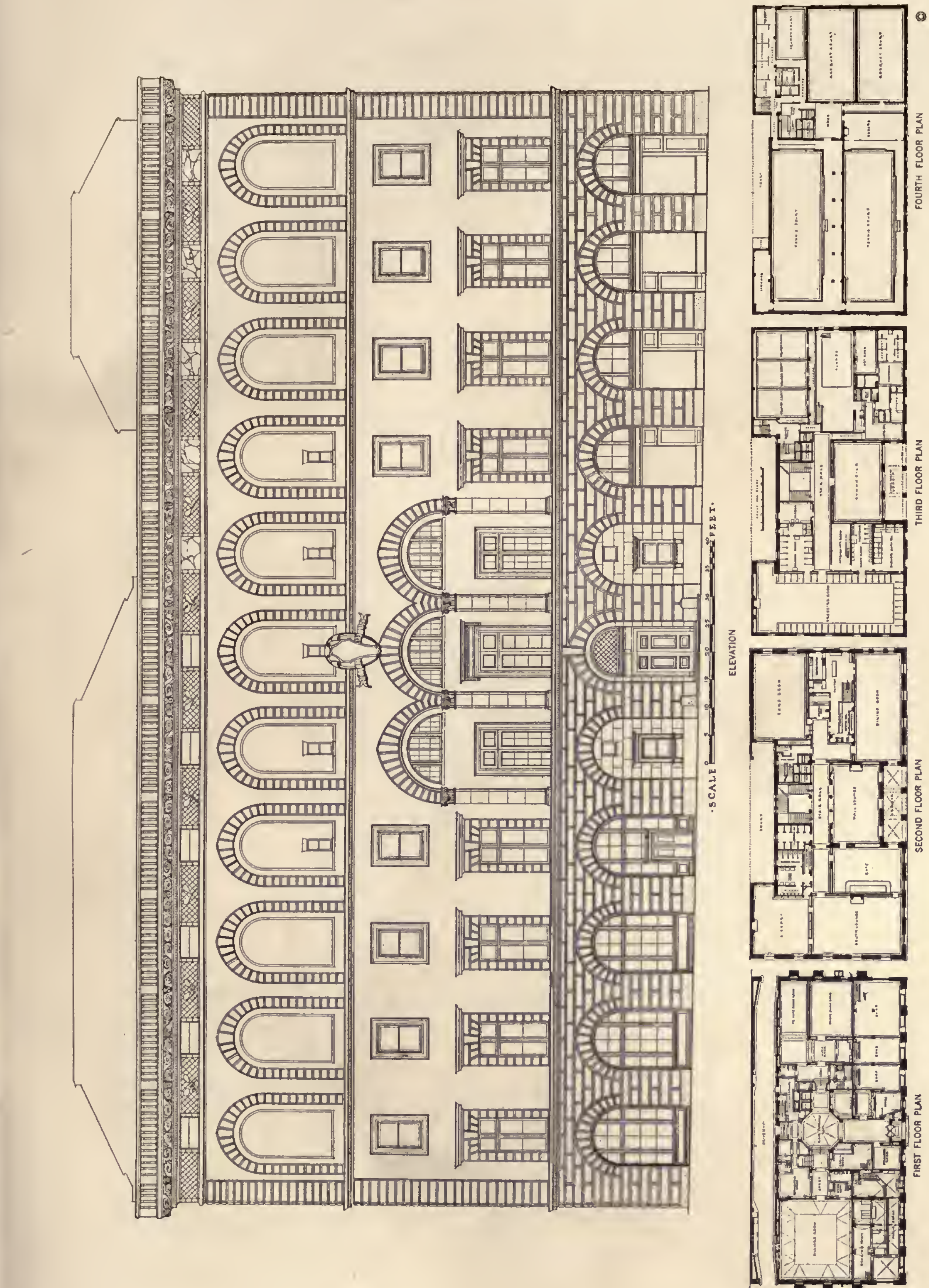
BLOCK PLAN OF GROUP

THE BURKE FOUNDATION HOSPITAL FOR CONVALESCENTS, WHITE PLAINS, N. Y. (1914)

McKIM, MEAD & WHITE, ARCHITECTS

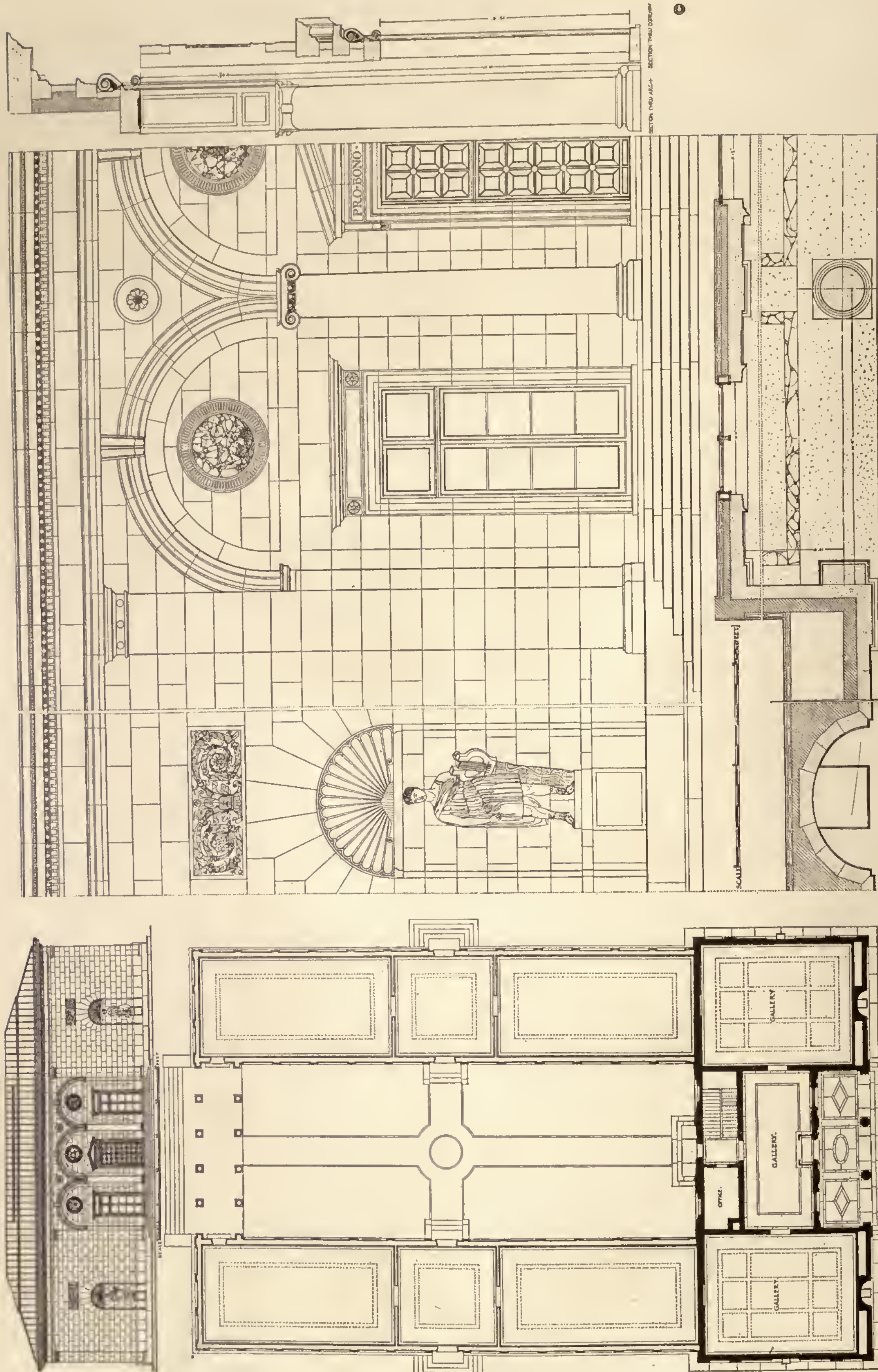



HOUSES FOR GERALDYN REDMOND, ESQ., AND THE COUNTESS
DE LAUGIER VILLARS, NEW YORK (1914)




THE RACQUET AND TENNIS CLUB, NEW YORK (1917)

McKIM, MEAD & WHITE, ARCHITECTS




ART GALLERY FOR JOSEPH G. BUTLER, JR., YOUNGSTOWN, OHIO (1917)

McKIM, MEAD & WHITE, ARCHITECTS

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## ARCHITECTURAL ACOUSTICS—I

### The Nature and Reduction of Office Noises

BY PAUL E. SABINE*

PART 1

QUITE apart from any considerations as to the effect of excessive and continuous noise upon the health and comfort of office workers, its effect upon the practical efficiency of the human element of business is of importance. Numerous mechanical devices have done much to speed up the machinery of modern office routine. Yet the efficiency of the whole process of business depends upon the precision and smoothness with which the human cog performs its function. Under scientific management, the effect of external conditions upon the human element must call for attention. Thus at the instigation of those interested in illuminating engineering, the effect of lighting conditions upon the speed and precision of typists and accountants has been studied by psychologists. It is equally well recognized by office managers that acoustic conditions are important as effecting speed and accuracy of office workers as well as the degree of nervous fatigue induced by their work. The din and confusion that may exist in a large office unit, to which sometimes hundreds of persons and machines may contribute, can be better imagined than described, and must be experienced to be properly appreciated.

Numerous questions as to the available means of office quieting arose in the construction of two of the new Federal Reserve Bank buildings now nearing completion. Various means of reducing to a minimum the noise from accounting machines, typewriters, coin counters, and telegraph instruments were carefully considered. All the scientific data available as to the relative efficiencies of the various sound absorbing treatment of wall and ceiling surfaces for the reduction of noise had been obtained by experiments conducted with sustained musical tones. As is well known, the sound absorbing properties of materials vary widely with the pitch of the sound, so that the application of these data to the case of office noises involves assumptions as to their pitch characteristics. Analysis of the sound produced by the impact of the type-bar of a typewriter or the click of a telegraph sounder presents considerable experimental difficulty. It seemed better therefore to make a direct study of the absorption co-efficients of materials for these sounds, rather than to attempt to apply the data for sustained tones of definite pitch.

Fig. 1. Sound Impulse generated by the snap of an electric spark

Certain elementary considerations may be helpful for a more thorough understanding of the effect upon the average intensity of sound within a room of introducing sound absorbing materials. If a single click of a typewriter, for example, be produced in the open air, a single pulse of condensation, followed by one of rarefaction is propagated as a spherical shell of sound energy. A photograph of the cross section of the sound pulse produced by an electric spark is shown in Fig. 1.

* *Riverbank Laboratories, Geneva, Ill.*

The total amount of energy in this shell remains constant as the sound advances. This constant quantity of energy is spread over a constantly increasing surface, so that the energy passing through a given area of the wave front decreases as the distance from the source increases, and we have the well known law of "inverse squares" between the intensity of the sound and the distance of the source. Conditions in a room having walls, floors and ceilings that are perfectly absorbing would

Fig. 2. Reflection at a hard impervious surface

correspond exactly to the out-of-doors condition. In such a room, the loudness of the sound would decrease rapidly as the distance from the source increases, so that with a number of sources of sound, those at a distance would contribute but little to the intensity as observed at any one point in the room. Thus the noise of an operator's own machine, supposed to be two feet from his ear, would be twenty-five times as great as that from his neighbor's machine ten feet away. Hence the noise to which each person in the room would be subjected would be mainly that originating in his immediate neighborhood, and office units of any size could be employed without the intensity of the sound becoming excessive.

The conditions in a room with ordinary surfaces are quite different from those just described. The present experiments indicate that hard plaster walls absorb between two and three per cent. of the sound that is incident upon them, reflecting the rest. In such a room, therefore, the sound from a single typewriter click must undergo a large number of reflections before being wholly absorbed. As an illustration, the time required for the sound from the impact of a telegraph sounder to die away to an intensity that can just be heard in the room in which these experiments were performed was 6.4 seconds. The average number of reflections of sound can be computed from the dimensions and is found to be about 500 in this time in this particular room. Let us suppose that the sounder is being operated at a rate of five impacts per second. At any instant the sound energy in the room is that which is produced at that instant increased by the residue of sound from the thirty-two impacts that were produced in the preceding 6.4 seconds. It can be computed that under these circumstances the average sound energy in the room is something over five times that produced by a single impact. Furthermore, these multiple reflections will tend to equalize the sound intensity throughout the room. Consequently, at any point, sound from a distant source will not be diminished according to the inverse square law, and each source will contribute materially to the noise throughout the room.

The photographs of the sound pulse produced by

Fig. 3. Reflection at surface of hair felt

the snap of a heavy electric spark, shown in Fig. 1, serve to illustrate the foregoing; Fig. 2 represents the reflection of such a wave from a smooth hard impervious surface. The reflected portion is shown and has a curvature of the same sign and magnitude as though it originated from an apparent source just as far behind the reflecting surface as the real source is in front of it, suggesting the familiar optical analogy of the formation of an image by a plain mirror. In Fig. 3, the same wave is shown, incident upon a surface of hair felt. Comparison of Fig. 2 and Fig. 3 illustrates strikingly the absorption of sound by such a material; the reflected portion of the sound in the latter case is too small to be photographed. The multiple reflections of the wave produced by a single sound pulse from the highly reflecting walls of a room are illustrated in Fig. 4. The model in which the photograph was taken was $2\frac{1}{2}$ inches square, and the exposure was made about .00033 of a second after the sound was produced. Enlarging the scale to a room 30 x 30 feet, the photograph would illustrate the condition of affairs about 1/20 of a second after the sound is produced. The prolongation of the sound in time and the equalization of intensity throughout the room can be easily understood by picturing the effect of these successive reflections from walls which absorb only one or two per cent. of the energy at each reflection.

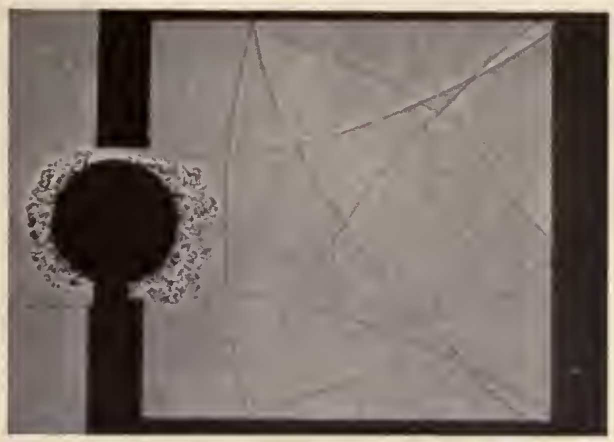


Fig. 4. Multiple reflections within a closed space

It appears then that the ideal conditions for a minimum of noise would be that of perfectly absorbing walls and ceilings. In the present investigation, the purpose was to determine the degree to which various practicable means of wall and ceiling treatment approximate this condition. In the first part of this paper the method of experimentation will be described, and the results obtained will be given in the second part.

## The Method

For a detailed treatment of the general method of determining the absorption co-efficients of various surfaces the reader is referred to the Collected Papers of Professor Wallace C. Sabine which have been recently published by the Harvard University Press, Cambridge. Certain modifications of the method and the theory are necessary for the application to impulsive sounds. The terms employed are defined as follows:

$E$ = the total sound energy produced by a single impact.

$I$ = the average sound energy, per unit volume of the room, at any time $t$ seconds after the impact. Call this the average sound intensity.

$I_0$ = the average intensity immediately after the impact.

$A$ = the time rate at which the average intensity changes.

$V$ = the volume of the room.

$a_1$, $a_2$, $a_3$, etc. the absorption co-efficients, i. e., the fraction of the incident energy absorbed at each reflection by the surfaces whose areas are $s_1$, $s_2$, $s_3$, etc. respectively.

$a$ = the total absorbing power of the room.

$s$ = the total surface exposed to the sound.

$\underline{a}$ = the average absorption co-efficient.

$n$ = the average number of reflections per second.

$v$ = the velocity of sound.

$t_1$, $t_2$, $t_3$, = the duration of audibility under conditions *1, 2, 3,* respectively.

By an analysis very similar to that given in the work just referred to, the equations given below are deduced. Two important points of difference should be noted in the results.

1. In the case of sustained tones, the initial intensity $I_0$ depends upon the absorbing power of the room as well as upon the rate of emission of sound by the source. For impulsive sounds the average initial intensity is simply the total energy produced, divided by the volume of the room.

2. $n$, the number of reflections per second is computed from the experimental value of $K$ in Professor Sabine's well known formula, $aT = KV$. The relations that will be found useful are:

$$I_0 = E/V \qquad (1)$$
$$At = \log_e I_0 = \log_e E/V \qquad (2)$$
$$n = vs/4V \qquad (3)$$
$$A = n\underline{a} = na/s = va/4V \qquad (4)$$

Substituting for the value of $A$ in (*2*) that given in (*4*), we have

$$at_1 = \frac{4V}{v} \log_e E/V \qquad (5)$$

Equation (*5*) involves two unknown quantities, namely, $a$, the absorbing power of the room, and $E$, the amount of sound energy produced by the source. If either can be experimentally determined the other may be computed by the equation. Thus if $a$ can be experimentally determined for a given room, the right hand member of equation (*5*) is simply the product of $a$ and the time in seconds that the sound continues audible. We may then find the absorbing power of any object brought into the room by determining the times of reverberation from the same source under the changed conditions. For if $a'$ *and* $t'_1$ be the absorbing power and the time respectively under the new conditions, then

$$at_1 = a't'_1 = k \text{ (a constant) } (6)$$

and the absorbing power of the object is $a' - a$. The method of determining the absorbing power for an impact sound of the Sound Chamber of the Laboratory (described in THE AMERICAN ARCHITECT of July 30, 1919) will be given in detail since it is one that can be employed in any room sufficiently reverberant, for any sound, the intensity of which can be varied in measurable ratios.

For this purpose, an ordinary telegraph sounder was used. The energy of the release stroke is proportional to the tension of the restoring spring. The sounder was modified so that this tension could be varied and its magnitude measured by balancing known weights suspended from a projecting arm on the sounder bar. When this weight is removed, the unbalanced tension of the spring brings the sounder bar against the stop, and the mechanical energy of the impact is proportional to the known weight. The electric current through the magnet coils was broken by means of the stop-watch chronometer. The time during which the sound persists after the stroke can thus be determined to within one fifth of a second, and by making a large number of observations, averaged values which are self-consistent to within a few hundredths of a second may be obtained.

The first question to be answered is that of the relation between the mechanical energy of the impact and the sound energy which it produces. The Sound Chamber observations fortunately furnish a direct answer to this question. By equation (5), the time of reverberation is proportional to the logarithm of the sound energy. If now, experiment shows that this time is also proportional to the logarithm of the mechanical energy, the proportionality between the mechanical energy and the acoustical energy is established. The results of experiments on this point are presented graphically in Fig. 5. The tension of the restoring spring was adjusted so as to balance successively different weights ranging from 12.4 grams to 102.4 grams. Distances on the horizontal scale represent the times in seconds during which the sound lasts. The vertical scale represents the logarithms of the weights, which are proportional to the energies of the blows. Graph 1 shows the results when the Sound Chamber is in the standard condition. Graph 2 shows the results of bringing 4.73 square meters of felt into the room. In both cases the experimental points lie very close to a straight line, thus establishing quite satisfactorily the proportionality between the energy of the sound produced and that of the impact producing it. The points of Graph 1 represent the mean of a much larger number of observations than do those of Graph 2, but in both cases, the agreement is sufficiently good to justify the statement that the energy of the impact and the sound produced are proportional over the range covered, so that we may take one as a measure of the other.*

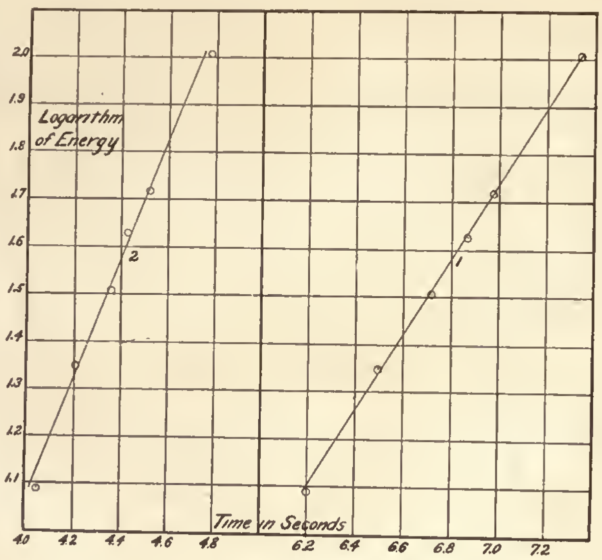


Fig. 5. Graphs showing linear relation between the time of reverberation and the logarithm of the mechanical energy producing the sound. Curve 1 is for the bare room; curve 2 after addition of 4.73 square meters of one inch felt

**Strictly speaking, the linear relation between the time of reverberation and the logarithm of the energy of the impact establishes only the fact that the sound energy varies as some power of the impact. In the absence of any theoretical reason for supposing that this power is any other than the first, this assumption is made, and the numerical values deduced in the succeeding paragraph are made upon this assumption.*

(*To be continued*)

# STRUCTURAL DESIGN PROBLEMS*

## A discussion of the present importance of the items of restraint, continuity and unbalanced moments

THE bending moment curve may be said to represent, to an exaggerated scale, the position of the neutral axis of a freely supported beam with the maximum possible deflection under the assumed loading. A beam thus deflected is flexible and as its position before loading is horizontal it must be elastic in order to form the curve. The neutral plane in graphical work is consequently dealt with as a flexible and elastic string with the ends fast.

Any vertical intercept between the string and a closing line connecting the supports to which the ends of the string are fast, gives the bending moment at the point on the beam through which the intercept passes. The horizontal line represents the true position of the neutral axis of the beam and the intercept represents the resistance set up to prevent it from assuming the curved form. When a beam on a single span is restrained the closing line merely shifts position so the sum of the areas of negative moment will equal the area of positive moment. With the continuous beam the closing line becomes a broken line with a change of slope at each support. The broken line is the thread of the neutral axis of the beam, the moment curve is the thread of a series of freely supported separate beams and the vertical intercepts are the bending moments. The closing line on each span of a restrained beam begins at the end of the moment curve and goes vertically from that point to the broken line which it follows to the next support where it drops vertically to the other end of the moment curve, forming a closed figure.

ANOTHER graphical treatment of continuous beams is shown in Fig. 6. The proof is given in DuBose's *Graphical Statics* and Church's *Mechanics of Materials*. Spans are plotted as shown with points of support $R_1$, $R_2$, etc., and each span is divided into three equal parts by vertical lines *1, 2, 3, 4*, etc. From each even numbered line set off a distance equal to one-third of the adjacent span and draw the vertical lines *A, B*, etc. Note that *A* falls to the right of $R_2$ because $L_2$ is longer than $L_1$; while *B* falls to the left of $R_3$ because $L_3$ is shorter than $L_2$.

When the extreme ends are freely supported lines *1* and *8* are ignored. A straight line is drawn from $R_1$, in any direction to an intersection with line *A* above the neutral axis *a, b*, of the beam. From the intersection of this line with line *2* at *2*, a straight line is drawn through the point of support, $R_2$, to an intersection at *3*, with line *3* below the neutral axis.

Through this point *3* on line *3* draw a line up-

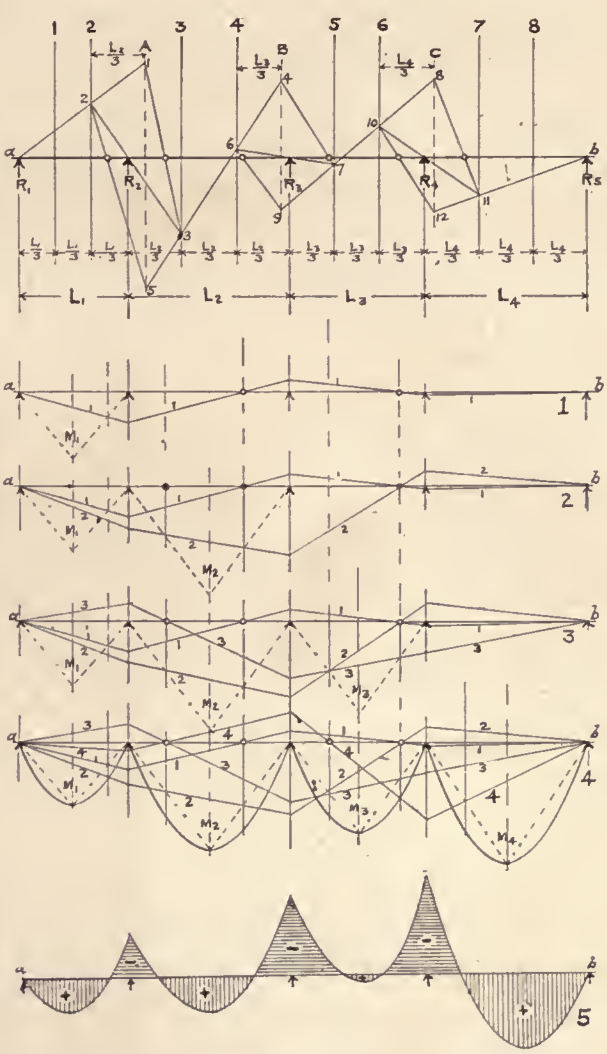


Fig. 6. Conventional Graphical Method for Moments, Shears and Reactions

ward, with any slope, to intersect line *B* at *4* and downward in an opposite direction to intersect line *A* at *5*. Connect *2* to *5* with a straight line, the point where it crosses the neutral axis being a point of inflection in $L_2$, marked by a small circle. Connect *1* to *3* with a straight line and thus obtain a point of inflection in $L_2$. From point *6*, where line *3, 4*, cuts the vertical line *4*, draw a line through the point of support, $R_3$, to an intersec-

*Continued from page 405, The American Architect, May 10, 1922.*

tion with the vertical line *5* at *7*. From *7* draw a straight line upward at any slope to intersect line *C* at *8* and downward in an opposite direction to intersect line *B* at *9*.

Draw a straight line from *6* to *9*, thus obtaining the second point of inflection in $L_2$. Draw a straight line from *4* to *7* to obtain an inflection point in $L_3$. From point *10*, where line *7, 8*, crosses the vertical line *6*, draw a line through the point of support, $R_4$, to an intersection with the vertical line *7* at *11*.

From the end of the beam at support $R_5$ draw a straight line through *11* to an intersection with vertical line *C* at *12*. Draw a line from *10* to *12* to obtain a second inflection point in $L_3$. Draw a line from *8* to *11* to obtain an inflection point in $L_4$.

Dropping to *No. 1* in Fig. 6, lay off the maximum bending moment, $M_1$, on $L_1$. Connect it by dotted lines to the points of support. From the inflection point drop a vertical line to intersect the dotted line to the interior support. Draw line *1* from *a* through this intersection to the vertical dropped through the support and from this point continue the closing line as shown to the end support, $R_5$, at *b*. On all spans except, $L_1$, moments where the closing line, *1*, is below *a, b*, are negative and where the line is above *a, b*, they are positive.

Dropping to *No. 2* in Fig. 6, set off the maximum moment on $L_2$ and draw the dotted lines to points of support. Through the points where verticals from the inflection points intersect the dotted lines draw closing line, *2*, in this span. Closing line *2* is then continued through the other spans as shown until it ends at *a* and *b*. On all the spans except $L_2$, intercepted moments between this line and line *a, b*, are negative when below and positive when above *a, b*.

Dropping to *No. 3*, the moment is plotted on $L_3$, and closing line *3* is drawn, following the method described for $L_2$.

Dropping to *No. 4*, the moment is plotted on $L_4$ and closing line *4* is drawn, following the method described for $L_1$; the other end span.

The complete moment curves are now drawn for each span as shown on *No. 4*, ready for a summation of ordinates so that *No. 5* may be drawn. In $L_1$, the ordinates from closing line *1* to the moment curve; in $L_2$, from closing line *2* to the moment curve; in $L_3$, from closing line *3* to the moment curve; and in $L_4$, from closing line *4* to the moment curve the moment ordinates are positive. Dividing each span into several divisions by vertical lines and algebraically adding the moment ordinates on these lines data are obtained for the construction of *No. 5*.

When loads are not uniform the maximum moment is measured on a vertical line through the center of gravity of the loads, but this does not change the methods described above. When the last figure is drawn the bending moment curve will not be a parabola but this merely affects the position and magnitude of the final curve of moments.

When the outer end of the first span is restrained, line *a, 2*, in $L_1$, Fig. 6, starts from the intersection of vertical line *1* with line *a, b*, instead of starting from *a*. When the outer end of the last span is restrained, line *12, 11*, in $L_4$ ends at the intersection of vertical line *8* with line *a, b*, instead of ending at *b*.

When there are changes in the moment of inertia use artificial spans by dividing the moment of inertia *in inches* by the span *in inches*, using

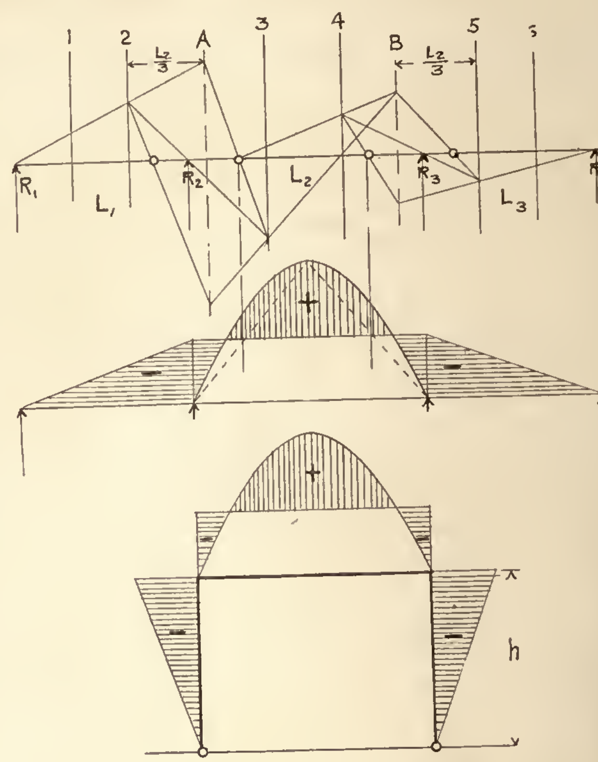



Fig. 7. The Portal Problem with columns hinged at bottom

actual spans and loads in the computation of bending moments.

In Fig. 7 and Fig. 8 the method is shown in its application to ascertaining the stresses in portals. The vertical supports are assumed to be continuous with the girder, forming a continuous beam of three spans. The center span is assumed to be uniformly loaded with no load on the end spans. In Fig. 7 neither column is restrained at the lower end while in Fig. 8 a condition of perfect restraint is assumed. This method was given in an article by F. E. Richart in *Engineering and Contracting*, June 23, 1920, it being one of a series written by W. M. Wilson and F. E. Richart.

It is a comparatively simple matter to design a floor or roof of many spans, by using "ready-to-hand" co-efficients found in building codes or other specifications. Such co-efficients, however, are applicable only when all the spans are practically equal and are uniformly loaded. The use of simple graphical methods, such as those here shown, gives the designer a picture of the true conditions and often introduces economy in material.

The practice of many designers is to study each floor by constructing two diagrams, one across and the other along the length of the building. In each direction a study is made with all spans fully loaded and also with alternate spans fully loaded, the spans between carrying dead load only.

Unbalanced moments at ends of spans are distributed to columns and to adjoining spans. The distribution is proportionate to the relative moments of inertia of such adjacent members.

The effect of continuity in beams is transmitted to columns and all interior supports, in the form of an additional load. Assuming two equal spans uniformly loaded the total load on the column will be $1.25wl$ in which

$w$ = total load in pounds per lineal foot.

$l$ = span in feet.

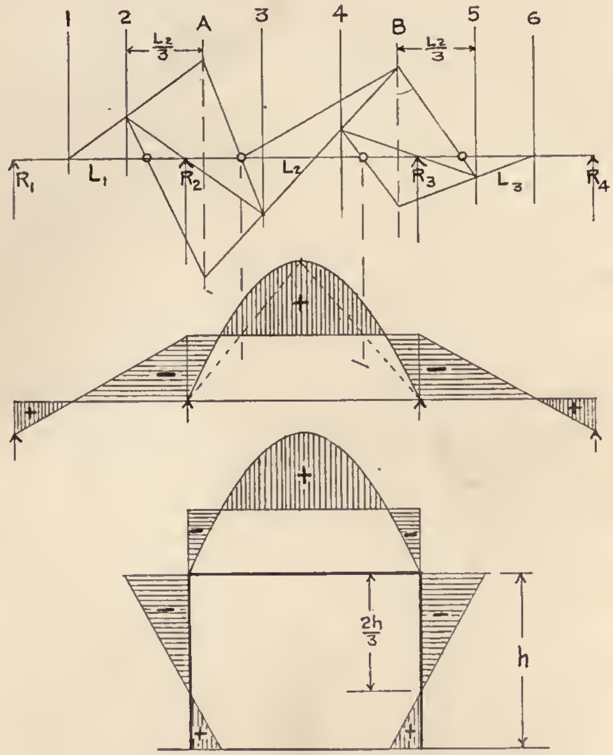



Fig. 8. The Portal Problem with Columns fixed

Assuming three equal spans uniformly loaded the total load on each column will be $1.1wl$. If one end span has no live load and the two other spans are loaded, the column under the two loaded spans will carry a load equal to $1.2wl$.

The co-efficients vary with the ratio of $\frac{\text{dead load}}{\text{total load}}$ and range from 1.0 for interior columns with a ratio of 1, to 1.14 with a ratio of 0 for three or more spans. For the column nearest the wall the co-efficients range from 1.1. for a ratio of 1, to 1.2 for a ratio of 0. The co-efficients are proportionate for intermediate values of the ratio.

These pressures caused by continuity have nothing to do with unbalanced moments; that is, the columns are assumed to have no stiffness and act merely as round-ended non-attached supports.

# TESTING CAISSON FOUNDATIONS

## An account of how tests were made on foundations in place to determine the carrying capacity and skin friction

ONE of the most important investigations conducted in Chicago recently has been the tests on caisson foundations conducted by the Chicago Union Station Company to determine their supporting power when resting on hardpan; the following account of how the work was done appearing in the April, 1922, *Journal of the Western Society of Engineers, Chicago, Ill.*

At the meeting on March 6 Mr. J. D'Esposito, chief engineer of the Chicago Union Station Company, delivered a paper describing the work that they had done to determine the actual amount of load that could be carried by foundations on the location of the new building which they are now constructing. The plans for the new Union Station were conceived in 1913 and it was contemplated that the building would be of only moderate height and accordingly the foundations were sunk to hardpan, a distance of about sixty-five feet, which would provide ample supporting power to carry a building of that weight. Due to the changing conditions, brought about by the war, it was decided to erect an office structure of about twenty stories and this, of course, greatly increased the load necessary to be carried by the foundations. In sinking the caissons for the original station, the company made very careful surveys of the soil and sub-soil conditions and determined conclusively that it would not be necessary to have them extend to bed rock in order to carry a building as then contemplated. Altogether 250 caissons of different sizes were put in, all of them resting on hardpan and calculated to withstand a load of six tons per square foot. To remove these 250 caissons and install new ones extending to bed rock would be enormously expensive and it was therefore decided to conduct a thorough investigation in order to determine whether they could be utilized to carry the heavier building.

Hardpan at this point is found at a depth of about sixty-five feet and is about twenty feet in thickness. The hardpan in turn rests upon a bed of soft material having low supporting power about five feet in thickness and this rests on bed rock. In order to test the foundations two entirely new caissons exactly similar to those in place were installed at a point as close as possible to the new building. The problem of concentrating a sufficient load on the top of the caisson to form any accurate conclusion was a difficult one, and it was solved in the following manner:

A large stack of rails, weighing a great deal more than would be required for the test, was supported on independent foundations at either side, and a specially made hydraulic jack was placed on the top of the caisson so that it would exert its force upward against the bottom of the stack of rails and thus a load which could be accurately measured was transmitted to the foundation under test. The scheme worked perfectly.

The method of conducting the test was to place a certain load on the foundation and keep it constant for a sufficient length of time to determine that there was no more settlement and then it was increased and held constant until it had again produced no further settlement. The load was increased until it was more than eighteen tons per square foot or over three times the calculated amount and held there until the caisson showed that it had permanently come to rest. The total settlement was about one and one-eighth inches, over half of which is accounted for by the compression of the concrete under load. When the load was removed the caisson recovered about one-half an inch of settlement, which is accounted for by the recovery of the concrete.

Two types of caissons were tested, one being a perfectly plain cylinder and the other having a wide or bell-shaped bottom. The results obtained from the two tests checked very closely and showed accurately the supporting power of hardpan.

After completing the above tests, a well was sunk along the side of the wide-bottomed caisson and examination of the concrete at different points showed it to be of the highest quality. A tunnel from the bottom of this well was dug under the bottom of the straight-sided or cylindrical caisson, so that all support from beneath was removed and then a further load was applied on it to determine the supporting power due to skin friction. It was found that the total supporting power due to skin friction for a caisson of this size amounted to 315 tons, which includes the weight of the caisson itself. This is equivalent to 700 pounds per square foot of surface.

In conducting these tests it was not the purpose of the Chicago Union Station Company to determine any new formulae or to attempt to make any changes in engineering practice, but rather to attempt to solve their own problems. The fact is that the results obtained are of great importance to the engineering profession.

### Cost Data on a Concrete House

IN Oak Park, Ill., Mr. A. J. R. Curtis of the Portland Cement Association built a home in which the walls are of Hydro-Stone concrete block laid in Portland cement mortar. A complete description appeared in the March, 1922, issue of *Concrete*.

The building is 28 ft. wide by 45 ft. long, two stories high, with hollow walls. The total cost was not stated but the elements of cost were itemized as follows by percentage of the total:

| | | Per Cent. of Total Cost |
|---|---|---|
| 1. | Land | 15.75 |
| 2. | Abstract and title | .35 |
| 3. | Architect | 4.15 |
| 4. | Building permits | .17 |
| 5. | Excavating | .55 |
| 6. | Hydro-Stone block and concrete art stone | 16.55 |
| 7. | Mason labor and supplies | 7.15 |
| 8. | Concrete (floors and walks) | 5.30 |
| 9. | Carpenter labor | 4.30 |
| 10. | Rough lumber | 5.95 |
| 11. | Interior trim | 6.15 |
| 12. | Stairs | .50 |
| 13. | Ornamental iron | .55 |
| 14. | Plumbing | 4.80 |
| 15. | Plastering | 2.83 |
| 16. | Stucco and carving | .58 |
| 17. | Glass and glazing | 1.35 |
| 18. | Tile and terrazzo | 1.55 |
| 19. | Sheet metal | .46 |
| 20. | Tile roof | ... |
| 21. | Composition roof | .40 |
| 22. | Electric wiring | 2.45 |
| 23. | Hardware | 1.30 |
| 24. | Heating | 5.05 |
| 25. | Decorating (general) | 2.70 |
| 26. | Decorating (walls) | 1.35 |
| 27. | Lighting fixtures | 1.45 |
| 28. | Linen shades | .44 |
| 29. | Screens | .43 |
| 30. | Gas extension | .23 |
| 31. | General contractor percentage | 4.05 |
| 32. | Sundry extras | 1.16 |
| | | 100.00 |

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

THE April number of *Architecture* has as a frontispiece a photograph of the statue which is entitled Civic Virtue, and which is colloquially known on Park Row as The Rough Guy. There is also published a statement by the sculptor, Mr. Frederick MacMonnies, in which he says that this youth is "*not* trampling, kicking nor stepping upon the ladies," as has been assumed, and that, anyway, they are not ladies but sirens, as anyone can tell from the fish tails, and that these wretched creatures are "trying to snare him with a net," obviously with little success. Mr. MacMonnies says further that he "is blamed for choosing . . . forms of sea monsters to suggest treachery and guile." "I did not invent this," he says, "I have to take things as they are." Can we infer from this that Mr. MacMonnies has actually seen real mermaids, or is he merely relying upon the testimony of such intrepid explorers as Walter E. Traprock or Captain Fitzurse? To those who have criticized the scale of the figure, Mr. MacMonnies says that "to throw back and indulge in the ease of archeology . . . would have been to make the neighborhood as dead as the Roman Forum or St. Paul's Churchyard." There are perhaps many who wish the sculptor had done what he considered the easier thing, the throw back in archeology, and who would prefer the calmness of the Forum or St. Paul's to the riot of Park Row; there are perhaps many who consider the scale and character of the statue entirely out of harmony with the City Hall, for the proper display of which every effort is being made to clear the Park of the unsightly buildings which choke it; there are perhaps many who find the symbolism meaningless and offensive, and who consider that viewed from any angle in the Park or on the street the silhouette is poor and the design confused; there are many who will criticize and some who will praise, but anyway you've got to admit it's a very large statue.

From "Architecture"

"Civic Virtue"

Frederick MacMonnies, Sculptor

Henry S. Churchill has an article on Three Basque Towns with some interesting photographs, particularly one of the courtyard of Onate University; and there is a good, simple bank at Watertown, Mass., by Dennison & Hirons, and a sympathetic article on Charles Cressent, a cabinet maker of the Regency, by Henry Coleman May. William Pitkin finds that there is Profit from a Profitless Year. Some of the profits he mentions are perhaps not very evident to most of us, but there is one profit which is a real profit indeed, and that is the profit that comes from the enforced presence of the architect in his own drafting room. In the last year and for several years in fact, many architects have turned draftsmen, and it has done them and their work much good.

* * *

In *The Architectural Forum*, April, William Roger Greeley writes of the Fourth Dimension in Schoolhouse Design, and illustrates it with some of the recent work of his firm. What Mr. Greeley has to say is good, practical common sense, particularly when he points out the dangers of over-standardization, and the fact that most standards are minimum standards. Another good point is the suggestion that the plan be made more elastic, so that the class rooms can be differently sub-divided, to provide for the growth of the school or for changes in the method of instruction. And he also alludes to the vital necessity for getting a little more imagination and a little more architecture into the schools; the elimination of the packing box type, and the study of each school as a separate problem, and the relation of site to the design and to the plan. It is to be hoped that many school boards may read Mr. Greeley's article. Costen Fitzgibbon continues his article on Baroque, Justice and Common Sense, and points out "the prevalence of noble and monumental scale; complete symmetrical conception of comprehensive and connected schemes of composition, in contrast to the more or less fortuitous and piecemeal methods that often obtained at an earlier epoch; the high value attached to the dramatic element; the elaboration of plan forms and the advance in garden design." The article is well worth reading and the illustrations are good. The greater part of the *Forum* is devoted to the Domestic Architecture of Henry Corwith Dangler, a title which seems a little misleading, as it is repeatedly called to the attention of the reader that the houses illustrated are designed by David Adler and Henry Dangler. However that may be, the houses themselves are good, the plans extremely simple and cleverly worked out, the detail excellent and the interiors charming. Two of the city houses are somewhat marred by the introduction of a roof story over the balustrade, the roof story being too conspicuous and having the appearance of being a later and unfortunate addition, but the quality of the whole exhibit is high. Howard Moise has some interesting drawings of Alsation Iron Work of the 18th Century which are well presented, and there are some good photographs of furniture in an article by Walter F. Wheeler.

From "The Architectural Review," London

Study for Panel—St. Ambrose Training His Choir at Milan

By Frank Brangwyn, R. A.

The April number of *The Architectural Review*, London, is an extremely good number, even for The Architectural Review. Always well gotten up, well printed and with excellent illustrations, this magazine is not only attractive to the eye but contains much that is valuable for future reference. The opening article is on the Mural Decorations at Christ's Hospital, Horsham, by Frank Brangwyn, R. A., illustrated by eight full page reproductions, two of which are in color. Mr. Brangwyn's work is too well known in this country to call for extended comment; his color, draftsmanship and composition have given him a position second to none, and the panels here exhibited are up to his usual high standard. Some of the studies are particularly interesting examples of draftsmanship, and we take pleasure in reproducing one of them. The panels, sixteen in number, are in the Chapel of Christ's Hospital, which is better known as the Blue Coat School and are about fifteen feet from the floor, "and," says the article, "run around the walls in a bold pattern of blues, old gold and warm grey. The dominant note is blue, the blue of the sky." The article goes on to say that these canvases are not directly affixed to plastered walls, but are mounted on stretchers

From "The Architectural Record"

Cottage at Tadworth, Surrey, England

L. Stanley Crosbie, Architect

over the brick walls, a method of doubtful permanency for paintings of this size. The Review continues its series of articles on the smaller English country towns and in this number gives some interesting views of old work in Burford, some quaint shops, almshouses and a curious building called The Tolsey. H. Elrington writes of the Lombard Churches of Rome, the illustrations of which are familiar but good; and there are published six drawings by Frank L. Emanuel,

From "The Architects' Journal"

Le Centaure Mourant
Antoine Bourdelle, Sculptor

under the general title of Disappearing London. Mr. Emanuel's work is, or should be, as well known in this country as that of Otto Eggers or Vernon Howe Bailey, and is very remarkable in character. The pen drawing published is not as good as the pencil sketches, two of which "Hercules Road, Lambeth" and "Back of St. Bartholomew's Church, Smithfield" are beautifully handled. One of the best of the set, a charcoal drawing called "The Portico of the Old General Post Office," reproduced on page 452, is extremely clever and brilliant. There is also an excellent memorial tablet to the late Phillip C. Thicknesse, an architect. The tablet is in white alabaster, very well composed, and was designed by Harold A. Dod, A. R. I. B. A.

*The Architects' Journal,* London, April 5. H. Bartle-Cox is quite sure that Antoine Bourdelle is a great French sculptor and to prove it exhibits as a frontispiece a photograph of Le Centaure Mourant. We never saw a centaur die, but we have our doubts whether he ever does it standing up, as M. Bourdelle seems to think he does. To be sure "mourant" sometimes means languishing, so maybe he is not dying at all, but only languishing, although it *does* look as if someone had wrung his neck, and we must say we don't blame him. Mr. Bartle-Cox, however, seems to like a little more action. "Repose in art," says he, "is very nice for tired brains, but rapidity and agitation is the spirit of the times," and so another, so-called L'Héraclès Archer, is published as an example of dynamic vigor. One naturally thinks of Hercules as a Greek, but not our artist: he is too modern for that, and has selected as a model what appears to be an acrobatic but feeble-minded Jugo Slav. "But," says Mr. Cox, "Monsieur A. Le Chatelier (Professeur au Collége de France) of whom Monsieur Bourdelle has made a portrait bust, writes a eulogistic appreciation of this statue in the publication *La Vie.*" Oh well, he got the bust, didn't he? There is an appreciative article on the work of G. Gilbert Scott, who has just been elected a Royal Academician; and an interesting view of

From "The Architects' Journal"

L' Héraclès Archer
Antoine Bourdelle, Sculptor

his uncompleted Liverpool Cathedral, and a very originally treated Catholic church at Ramsey, Isle of Man.

In a review of an address before the Architectural Association by Mr. Gilbert Bayes, occurs the following: "Once sculpture was sunk in symbolism, such as Charity giving alms to Poverty, but restrained by Prudence, as Mr. Arthur Rackham had once put it." In the same number, under date of April 12, there is an account of the paper read by Mr. Stanley C. Ramsey, F. R. I. B. A. on London Clubs, which is interesting and the illustrations well worth preserving. The Reform Club, here illustrated, designed by Sir Charles Barry in 1837 is perhaps one of the best.

*The Architectural Record,* April. Leon V. Solon continues his series of articles on Architectural Polychromy, and in this number brings out two points—that as actual gradation of color was impossible, a color gradation was obtained by concave or convex modelling of surfaces; and, second, that in the interest of color harmony the colors were outlined and separated from each other by uncolored spaces or by bands of contrasting color. As to the first point there is no question that a considerable effect of color gradation is obtained by the surface modelling; but that the surface modelling was done solely to obtain this result, as Mr. Solon suggests, is quite another story. That the design and detail of Greek architecture was influenced by color to some extent is probable; that is to say, the Greeks probably always conceived their design as being colored; the triglyphs were always blue to them and the metopes red and so on; but their ornament was modelled first, and colored afterwards. The Anthemion illustrated in Plate IV would have the same play of light and shade in uncolored marble. The second point is well taken. Mr. Solon's illustrations are excellent and numerous. It is a pity they couldn't all be in full color, but the expense was doubtless prohibitive; in any event it is to be hoped that these articles will be published in book form.

From "The Architects' Journal"

The Reform Club, Pall Mall
Sir Charles Barry, Architect

From "The Architectural Review," London

The Portico of the old General Post Office

Harold D. Eberlein has another article on another Italian Villa near Florence, the photographs being good and rather unusual in character; and there is published a charming little cottage in Surrey by L. Stanley Crosbie, which is reproduced on page 450. Horace W. Peaslee writes of Zoological Gardens in an interesting way and gives very good advice to any one who might have a chance to design a Zoo, but as problems in Zoo design are rare the article loses somewhat of its educational value.

*Journal of the American Institute of Architects,* April. Isn't it simply *wonderful* to be up-to-date in everything one does? In the choice of words, if you get what I mean. And our little group of serious thinkers are quite up to date, as the following quotation from Shadows and Straws will show: "In the race to thwart men by threatening them with the law, registration seems the best gesture that architects can make." "Every night," says Hermione, "I ask myself, have I made a gesture today, or have I failed?"

Frederick Lee Ackerman has an article on the Building of Manhattan, illustrated with ærial views of New York, which are most convincing, and are much more effective in proving his points than any other form of illustration could be. Mr. Burt L. Fenner writes of Skilled Mechanics in the Building Trades, and the development of the apprenticeship system in which his committee is now doing pioneer work in New York. There is probably no architect, certainly no busy architect, who has given so unselfishly of his time and experience for the advancement of public and professional matters, as has Mr. Fenner.

A committee of the Illinois Chapter is anxious to restore, or rather to have someone else restore, the old Fine Arts Building of the World's Fair of '93, and they think among other things that "it would be a good place for the display of unusual drop curtains of artistic merit from the theatre or opera company that otherwise might be destroyed." We are in doubt whether it is the theatre or the opera company which otherwise is doomed to destruction; perhaps it is a covert allusion to Mary Garden: but if there is to be a restoration of the old Fine Arts Building, why not rebuild it according to the designs of the original architect, Monsieur Bénard?

In the Book Review Mr. Charles H. Whitaker gives an excellent review of the book Ad Quadratum, published under the auspices of the Norwegian Government. Mr. Whitaker says: "Mr. Frederik Macody Lund has applied certain geometrical theories to the cathedral of Nidaros, Trondhjem, Norway. Apparently they are considered so important that his work has been published by order of the Norwegian Government, which leaves us exactly where we were before. The façades of Nidaros and of other well known churches are overlaid with a series of straight and curved lines purporting to prove Mr. Lund's conclusions. If they are proof then all is over, of course, but in the drawing of these lines the author seems to have had a curiously childlike predilection for making them begin and end at points exceptionally favorable to his own conclusions. Also, he seems totally to have ignored the long process of trial and error, of experiment, of patching and altering, by which most of the mediæval churches attained structural solidity. There are eighty-seven ways more or less of making an architect. We would suggest trying the other eighty-six first."


Detail, Lower Stories, Municipal Building, New York
McKim, Mead & White, Architects

HOUSE OF THOMAS NEWBOLD, ESQ., NEW YORK

McKIM, MEAD & WHITE, ARCHITECTS

# ARCHITECTURAL DRAUGHTSMANSHIP*

BY PROFESSOR WILLIAM ROTHENSTEIN, M.A.

Principal of the Royal College of Art

THE only time I had the honor of being a guest at this noble Institute, we were looking over the architectural drawings, discussing them informally, and, as always happens in life, the professional artist, who is supposed to like vague and romantic things was drawn to the severest drawings, while the architect was attracted by the looser painter-like things. So the suggestion was made that we might discuss this together, and here I am, in front of a rather frightening audience. And the curious thing is that, as a practicing painter finding oneself among architects, one realizes how very little we know about one another. There are many new things in the modern world of Art, and this is one of them; that painting and architecture were closely united in the past, is a truism. I do not even know whether the views which a humble painter holds on architects' drawings will be sympathetic to you; whether you share these views, or whether you will disagree. Perhaps one of the main points I might come to at once is this—I did touch upon it at the beginning—that I think there is a misconception among a great number of architects as to what a painter-like drawing, or a draughtsman's drawing, really is. And it is odd it should be so today, because the new orientation in the graphic arts is towards an almost mathematical severity. Those dreadful people whom we call the younger men, whom one of your members, with an unusual lapse of psychology in a distinguished architect and scholar, and himself a fine draughtsman, accused of being "washy" in their work, can more justly be accused of idealizing the machine. Through their intellectual admiration for the hieratic art of the past they have been trying, often absurdly, to reduce æsthetic formulas to something like mathematical precision. Sir Reginald Blomfield, a very old and delightful friend of mine, accused these young people of sloppiness. You, as architects, should understand and sympathize with this curious mental attitude which is characteristic of a good deal of European painting and sculpture at this moment. Even some of us older artists are a little envious of your use of the T-square; we would like our lines to be as precise and swift as yours. And when we turn to your drawings, hoping to find support from your precision, we find that you are inclined to neglect your own precious inheritance and to turn to something which we do not recognize as belonging to the true spirit of our own particular age. Now in your building you must of necessity be influenced by precisely the same spirit that inspires contemporary musicians, philosophers, men of science, and artists. We are all approaching the same reality from different angles. And if a great number of modern architectural draughtsmen do not know the more intelligent aims of their colleagues in art, it shows that there is something a little wrong. Each age inherits as a legacy an instrument ready to its hand, and we use any other instrument at our peril. Good taste will never make up for a sincere use of contemporary material, and no study of the past, no preference for one æsthetic principle which a past age has practiced to perfection, will make up for our failure to use fruitfully the instrument we are born to work with. Whatever the fashion of our day may be, it is the natural outcome of all that has gone before. We are sometimes accused of being too eclectic and derivative; yet I find in a great number of modern architects' elevations—because, of course, I am not dealing with plans—a lack of the scholarship which is characteristic of the best art of any period; they miss precisely those elements of severity and austerity, sensitiveness to proportion and balance of rhythm, which I would have thought were the very qualities which architects would have understood better than any other artists. So in going round these drawings it happens that the nearer the elevations approach to the plan, the more I find myself in sympathy with them; and the more artistic in intention the more alien do they appear. It seems to be rather a paradox that a man brought up without any architectural training should hold these views. And I may mention that a good number of the best artists I have known were first educated as architects, and their art has in consequence gained because they had the advantage of that severe training which gave them knowledge of construction and respect for a T-square, and it is a training I, personally, bitterly regret having missed. And you who have had this education, when you handle our common instruments, pencil and brush, should bring to bear upon it the particular qualities which are your birthright.

I believe that your clients often require from you elevations and perspective drawings which appear to most of them more human and comprehensible than your plans. Now when, in anticipation of my promise, I came to your admirable library recently to consult English, French, Italian

*An address given before the Royal Institute of British Architects.*

and German architectural magazines, I looked with a new interest at the elevations of modern European buildings. The closer these elevations approached your plans, the better did they appear to me to be, but in the more pictorial perspective drawings the influence of the work of those we accept as true artists was less noticeable than the fascination exercised by the more trivial and insincere painters. This surely should not be the case. We pay homage to great art, not with our lips alone, but through our work. We who practice the arts know the rare combination of qualities required to form a great artist, whether he be sculptor, painter or architect. When we become aware of someone whose vision and handiwork can survive the acute and fresh judgment of a succeeding age we may fairly expect some influence will have made itself felt upon their own age by sensitive contemporaries, and at least that later men will be actively conscious of it. Now architectural drawing has one thing in common with great painting—it is by its nature severe in statement and purpose; one would suppose architects quick to appreciate the severer elements in contemporary art, for instance. If, then, you propose to bring pictorial qualities into your work, I put it to you that it might be worth your while to understand the more scholarly and the austerer elements in modern painting and sculpture. I was surprised to find even so admirable an artist as Norman Shaw putting trees and bits of landscape into very severe and beautiful architectural elevations, which would scarcely appear to a student of art to be drawn by a contemporary of Watts, Burne-Jones or William Morris. A tree is as full of form as a roof or a buttress. We are all students; we have the Italian art of the past to tell us, if we have not time to go to nature, what design and form mean. And I should have thought that when you drew a clear and precise elevation and wished to put in landscape surroundings, you would do this in a way which showed a sympathetic formality.

When an architect has faith in the traditions of his own great pursuit and keeps to the instruments which furnish the drawing desk, he achieves something very like the qualities of the great painters. With T-square and compasses he achieves the beautiful swift line, the kind of line every draughtsman wants to get on his paper, the line we see in the drawings of Ingres and Alfred Stevens. It seems to me a puzzling thing that this noble inheritance which architects have, should be replaced by a trivial amateurishness. But we all, at one time or another, miss the way and go wandering after strange goddesses. Least of all can members of my profession throw stones.

But if I may be allowed to speak especially to the youngest members in the room, may I suggest that they inform themselves what truths the most vital philosophers, poets and men of science are pursuing. For we are all children of the same age, and to find the truth we are ourselves hunting approached from a different angle is often heartening and inspiring. Last of all, perhaps you will discover what painters are thinking about, with what ideas of form they are occupied. And if you can allow yourselves to be influenced by contemporary work which contains true quality and distinction, your own drawings may gain in weight and authority.

Of your plans I am offering no criticism: I am speaking only of elevations. When these are drawn simply and with severity, these elevations seem to me often impressive works of art. When the draughtsman is wanting in faith in the beauty of straight mouldings and of well pointed stones or bricks, in "the straight allure of simple things," in fact has no faith in the vitality of his own building, and consequently wishes to give it a picturesque appearance, he is apt to wander from the straight path. Perhaps the artist's love for the picturesque has misled him. I admit there is something extraordinary touching in quoins and coping, cut and laid down by once busy human hands, and some element of this feeling one hopes will creep into the work of one's own hand. The appeal which old buildings make to the artist's spirit may come from the fact, or fancy, that nature adopts man's handiwork, making it, when it has been sound enough to endure, appear her own. Hence to draw buildings carelessly seems a slight upon both man's work and nature's.

Some of the most beautiful drawings I have seen have been made by architects in their sketchbooks, and certain painter friends of mine who have had the good fortune to begin their training in architects' offices, not only draw buildings with an especial sensitiveness, but show deep appreciation of architectural beauties.

Nothing gives one greater æsthetic pleasure than the just proportions and mass of a building, whether it be a cathedral or a barn, perfectly adjusted to the earth on which it appears to have grown. All the forces of nature, gravity, wind and storm, and the radiance of the sun, seem to have endowed it with almost superhuman qualities; a ship with her sails spread, seems only to evoke a similar perfection.

You young architects, then, who have greater knowledge of building than any painters can have, might well think it worth your while to study the severer ideals of the painter's and draughtsman's art which might well form the basis of your own elevations.

There is nothing I dislike more than using the past to belabor the present; it is an irritating and disheartening habit of debate. But we can learn one thing from earlier periods of art—when men are deeply absorbed by the visible world they have faith in every manifestation of life, and are not interested in decay. The architecture of Botticelli or of Crivelli is what people today would think the architecture of the railway station and the post office, with the pointing freshly laid. There is an evident pleasure in clean carving and ironwork. Today there appears to be an idea that the only excuse for being interested in buildings is that these shall be crooked and weather-stained.

If painters believe this, architects should know better. And in drawing your attention to the drawings of the earlier architects, I think you will discover that their elevations were singularly like the buildings depicted by the painters, and that up to the time of Canaletto, painters and architects drew in the same manner.

The Derrick
War Scenes in Wooden Ship Yards — Shaw Fund prize 1920
*From the Aquatint by Frederick K. Detwiller*

# BUILDING IN SOUND

ABT VOGLER never reared a palace of music fairer than that which was built before the eyes of members of the Architectural Association recently states *The Architects' Journal*, London. The occasion was a "lecture on 'Building in Sound' illustrated at the piano," but Mr. Frank Hutchens, who is professor at the Sydney Conservatoire of Music, gave his audience a treat such as lecture-goers seldom enjoy.

A few pertinent, albeit delightfully informal, remarks on the inter-relationship of the arts introduced a wealth of musical explanation and illustration, and a succession of familiar works was endowed with new and wider meanings, and one or two less-known pieces added a spice of delicious unexpectedness to the feast.

Music, said Mr. Hutchens, was a mental stimulus, and knowledge of it could not but be useful, but there was a lamentable lack of intelligence in the attitude of the sister arts. The laws of architecture were clear and concise, those of music were intangible, but many terms—form, harmony, rhythm, balance—were common to both. All art is a discovery capable of no explanation apart from reason; but, whatever may be its expression, it is inspired by the same fundamental spirit. Form, for instance, so obvious in building, was only gradually unfolded panoramawise in music; but it was there nevertheless, and in both arts form and balance were essential to enable work to stand the test of time.

Dwelling on the importance of contrast, Mr. Hutchens played some Beethoven extracts, aptly illustrating the dramatic value of the element of surprise, and of the greatest effect of all—silence. From Beethoven and Chopin also he demonstrated the sweet uses of harmony, which he described as a form of decoration. Simple themes, he said, delicately varied, rest the ear even as harmonious architectural embellishments refresh the eye. There was all the difference, however, between the charm of successful variations and the detestable affectation of art which was extraordinary for the sake of extraordinariness, clever for the sake of being clever.

A little Hindu song of Rimsky-Korsakoff's afforded convincing illustration of the hypnotic influence of even rhythm, and dazed audience, shaking itself into sufficient wakefulness to clamor for more, may possibly have wondered whether an ordered reiteration of forms in the designs of their creation would produce the same effect on passersby.

Passing on to the vexed question of realism, the lecturer pointed out that the artist sees the inward reality of a thing, and does not attempt a literal portrayal of its outward features. Rather, he seeks to arouse the same emotion by his own methods. Ravel and Debussy had achieved amazingly successful aquatic effects, and a Scriabin Nocturne afforded a fine example of the classical method, with its contrast in tone and subtly thought-out note values.

The art of illusion came into music not less than into architecture, and Mr. Hutchens instanced the feeling of size and progress given by a swift alternation of high and low, of large and small.

Chopin, Liszt, and an entrancing little cradle song by, we believe, a Finnish composer, brought the recital to a triumphant conclusion. Words and music alike gave infinite food for thought. Mr. Hutchens did not press his points or labor his analogies. He just showed what musical expression of fundamental laws could accomplish. Architecture is merely a different medium: when will it regain the power of producing the same effect, arousing similar emotion? That may come. At the present day one is tempted to re-echo the conclusion of Browning's "Abbé": "The rest may reason and welcome: 'tis we musicians know."

TOWER, CHURCH OF SANTIAGO, TOLEDO

THE AMERICAN ARCHITECT
The ARCHITECTURAL REVIEW
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# SULGRAVE MANOR HOUSE*

THE Sulgrave Institution of Great Britain and America has for its object the promotion of an Anglo-American understanding, and is widely supported in both countries. During the ten years of its existence it has carried out the following work: the purchase, partial restoration and furnishing of Sulgrave Manor, the organization in 1913 of the celebration of the centenary of the Treaty of Ghent (the precursor of one hundred years of peace between England and America), the organization of the Tercentenary of the Pilgrim Fathers (1920), the initiation of Britain's Day Celebration in the United States, the foundation of the first Chair of American History in England, the publication of over twelve historical and other works on Anglo-American relations, the placing of the St. Gaudens monument of Lincoln opposite Westminster Abbey, and the presentation of a statue of Lincoln to Manchester, a Lincoln memorial to Hingham, Norfolk, the initiation of a gift of a Washington statue from the State of Virginia to the British people, and that of a Washington bust to St. Paul's Cathedral, as well as the promise of busts of Chatham and Burke to the American people. It is proposed to raise another £50,000 in this country for the more effective organization of the movement, for completing the furnishing and restoration of the Manor House, for founding scholarships in America for British boys and in England for American boys, together with traveling scholarships for journalists, and for the development of the Manor House, Bredon's Norton, an adjacent property which has been bequeathed to the Sulgrave Institution by Mrs. Woodhall Martin, and is to be utilized as a center for Anglo-American conferences, study and research, and as a rest house for Americans visiting England.

The connection of the Washington family with Sulgrave dates back to Lawrence Washington of Northampton, of which town he was twice Mayor. He bought one of the two manors into which Sulgrave was divided on the dissolution of the religious houses by Henry VIII. for £321 14s. 10d. Sulgrave was held by his son Robert, who succeeded to it in 1584, but in 1610, with the con-

*Reprinted by permission from the January 13 issue of The Architect, London, to whose editors we are indebted for the use of the accompanying illustrations.

sent of his eldest son Lawrence, the Sulgrave estates were sold to his nephew, Lawrence Makepeace, of Chipping Warden, Northants. Here the connection between the Washington family and Sulgrave was terminated. Two more generations of the Washingtons lived in England, John Washington emigrating to America, where he died in 1677. Another period of two generations separated this John Washington from the George Washington who was born in 1732 and died in 1799. In George Washington were typified characteristics which were essentially English, and never more so than in the instincts which led him—typically conservative and aristocratic in temperament as he was—to become the great protagonist of England in the War of Independence. Maine in his work on the American Constitution has clearly shown how the founders of the United States felt it to be necessary to place every possible bar in the way of a hasty use of democratic powers. The Americans were in fact—like the barons in the reign of John—banded together to resent what they felt to be the abuse of constitutional rights; and it is this standpoint which differentiates the American Revolution from almost any other in the world's history.

Sulgrave Manor House stands at the east end of the picturesque village of Sulgrave in the south-western part of Northamptonshire, not far from the borders of the counties of Warwick, Oxford, and Buckingham.

The Manor House, at the eastern extremity of the village, is separated from the road by a field containing some old elms which formerly may have been part of an avenue. The house, a gabled limestone building of two stories, with dormer windows, is made up of two blocks at right angles, the south-southeast part consisting of a porch and gable, hall and bedroom, all forming part of the original work. The main entrance was through the porch, which has a four-centerd arch under a square head and label. In the two spandrels are the Washington Arms with the mullets and bars sunk instead of in relief, that on the left only having a crescent. Unfortunately this coat of arms has been damaged by the weather. Over the

The Dining Hall

The Courtyard, Sulgrave Manor, Brackley, Northants, England entrance on the outside is a shield embossed in plaster with the arms defaced, as they have been for at least one hundred and thirty years. Above this is a window surmounted in the gable by the Royal Arms which display the lilies of France and the lions of England quartered all within the garter and supported by dexter a lion, sinister a dragon. Over this is some embossed plaster work and the letters "E. R.," and the Tudor rose and the French fleur-de-lys appear in close conjunction with the coat of arms. Evidently the initials stand for "Elizabeth Regina." Also inside the porch, embossed roughly in plaster, is a lion on one side, and on the other a dragon.

A Bedroom

The passage, or "screens," from the porch straight through to the back door was about five feet wide. The original back door from the "screens" to the court has been removed, and a doorway in the style of about 1700 has been substituted a little more to the east. The original hall to the east of the "screens" remains, but it has been divided. Originally it was about twenty-four and a half feet in length by eighteen feet in width. At the east end is a fireplace seven feet in width under a mutilated four-centered arch.

The wing which stretches northward at right angles to the old hall is too far to the west to be part of the original design. It has no really ancient features in it, and on the ground floor is divided into an oak staircase of well worked twisted balusters, an oak-panelled sitting room and a kitchen. It is stated that at one time there was a large arch with a porter's lodge over it to the northwest of the present hall. If that is true then there must have been a court on the north side of the hall with wings to the east and to the west of it. The wing to the east would contain the family apartments and that to the west the kitchen and buttery. The house was at any rate arranged, and at least partly built, on a large scale. Perhaps the original design was never completed, but from an old account written in 1789 it is known that part of the old buildings had been just recently pulled down.

It is interesting to note that the stars and stripes are founded on the basis of the arms of the Washington family which are described as Argent, Two Bars Gules, In Chief Three Mullets of the Second.

The pieces of furniture in the dining room and bed chamber are all fine contemporary pieces contributed by various people. Amongst these may be mentioned the late Lady Paget, Lord Furness, Lady Sackville, Lady Cunard, Mr. Pierpont Morgan, Mrs. Whitelaw Reid, and the Stars and Stripes Club of Manchester, which gave us the fine bedstead in the upper chamber. Amongst numerous other gifts are a fine bronze bust of Washington (copied from the Houdon original) presented last June by the Sulgrave Institution of America, British and American flags presented by the British Pilgrims and American organizations, and various deeds and letters signed by

Porch and Door

George Washington and members of his family.

The grounds around the Manor House have been newly laid out by Sir R. Blomfield, and there will soon be a very beautiful old English garden surrounding the place. The two chief features of interest on the outside of the building are the Washington Arms on the right spandrel of the main doorway on the south front, and the Tudor Arms in the gable over the same doorway. These are objects of continual interest to the many American and other visitors who now visit Sulgrave Manor.

It will be seen from what has been said that the Washington family were only connected with the old property of Sulgrave for a brief period of its history; but to Americans, who more than any people value associations, it affords the most tangible link between the Washingtons as an English family and the great Virginian, and it is, and will be, more and more a place of pilgrimage for Americans in England. It is, therefore, wholly appropriate that it should in these later days form the center of a great association, having for its object the furthering of good understanding and international friendship which, but for the unhappy mistakes of our forefathers, would have kept the English speaking race an indivisible unit.

The Ante Room


Fig. 1. Sixth Century Byzantine Mosaic from San Vitale, Ravenna

# STAINED GLASS—II. HISTORICAL PERIODS

BY JOSEPH G. REYNOLDS, JR., Craftsman

IN considering the history of stained glass it is helpful to divide the time during which it was produced into periods. Such a division must of necessity be more or less arbitrary, for no hard and fast date can be set down as marking the end of one style and the beginning of another. But in this article our interest in the history of the art of window making lies in studying the salient characteristics, and comparing the relative artistic merits, of each style.

For the sake of convenience, then, let us divide this era into six periods:

1. Earliest glass—late eleventh and early twelfth centuries, Byzantine in style
2. Twelfth century—Byzantine and Romanesque in style, found in round-arched windows of the architecture of the period
3. Early Gothic—thirteenth century
4. Middle Gothic—transitional glass of the fourteenth century
5. Late Gothic—fifteenth century
6. Renaissance—of which the finest was made in the first half of the sixteenth century

## Earliest Glass
### Late Eleventh and Early Twelfth Centuries
*(Byzantine in Style)*

The Byzantine artist combined the Oriental love of elaborate detail with the severity and dignity of design of the Greek. He cared little for a faithful imitation of nature but preferred to express himself by traditional symbols and conventions. He worked in line and flat tones rather than in chiaroscuro. His art was essentially decorative rather than pictorial, (Fig. 1). These Eastern and Hellenic influences and traditions were inherited by the early workers in glass.

There are comparatively few of the earlier windows in existence, the very earliest being in the Cathedral of St. Julien at Le Mans, France. Those at the western extremities of the north and south aisles are especially interesting for they are among the earliest examples of medallion windows. The subjects are from the legends of Sts. Gervasius and Protasius, two early Christian martyrs. The medallion shown on page 465, (Fig. 2) illustrates the martyrdom of St. Protasius. The Roman Prefect, robed in a brilliant white tunic and a deep, velvety-toned mahogany-brown mantle, green cap and red socks, is seated on a dais, his right arm raised in command. St. Protasius in a wonderful gold tunic and blue mantle, his head surrounded by a gold nimbus, kneels while the executioner, dressed in a green robe and blue socks, grasps the martyr's hair in his left hand and wields the sword with his right.

The Hand of God in the attitude of the Greek form of benediction and nimbed with blue, issues from the clouds above. While the ground behind the Prefect, who is seated indoors as indicated by the canopy, is blue, the background of the rest of the medallion, including the border, is ruby. The execution is taking place out of doors as shown by the grass and earth on which the figures stand and kneel, and the palm trees that break across the background.

The whole composition shows a strong influence of the Byzantine traditions as evidenced by the use of pearls in the border, halo, trees, clouds, and canopy; also by the stiff attitudes of the figures, the clinging draperies with their peculiar angular folds, and the strong silhouette of the details against the background. The general design is dignified and noble in its simplicity. There has been no attempt to imitate natural forms, either in drawing or color. All the details, even the hair and the faces of the figures, have been treated purely from the standpoint of design. The hair is either solid black, as in two of the figures, or little lines have been scratched out to indicate


Fig. 2. Early Twelfth Century Medallion from the Cathedral at Le Mans

curly hair. No shading in tone is attempted; forms are indicated in line only. The trees are not real trees, but symbols of trees. Even in color there is nothing realistic about them. The trunks are white, the leaves and fruit bright blue, rich gold, and green.

The panel is, first of all, a masterly composition in color, a marvelous bit of decoration with a wonderful mellowness and richness of tone. Ruby and gold are woven in and through the whole design and are balanced by green and blue of just the right qualities. The ruby is deep and glowing and the blue is of that greenish azure quality not found after the middle of the twelfth century. In quality of design and color it is as splendid as any window of the great period. The greatest masterpieces of the twelfth century surpass it only in grandeur of scale.

### Twelfth Century Glass

### *(Byzantine and Romanesque in Style)*

Of the twelfth century glass much more remains than of the earliest period.* To this century belong the most beautiful windows that have ever been created. It was the Golden Age of stained glass in which individual masterpieces were produced; marvelous in design, glorious in color, with a charm that even today holds us spellbound.

The great central east window at Poitiers, here shown, (Fig. 3) disputes with Notre Dame de la Belle Verriére at Chartres the glory of being the finest window extant, the preference in color lying with the former.

The Poitiers window is about ten feet wide and twenty-six feet high. It contains three main subjects, the chief of which, the Crucifixion, occupies the central portion of the lancet. Upon a ruby cross, bordered with blue, is placed the figure of our Lord, the head surrounded by a cruciform nimbus, white with a gold cross. Standing at the foot of the cross on the left side are Mary, the Mother of Jesus, and the Roman soldier with the spear. On the right side are John, the Beloved Disciple, and the soldier with the sponge on hyssop. These figures are in blue, gold, olive-green, and a neutral red-violet on a brilliant ruby background. At the top of the window is the Ascending Lord—enclosed by an aureole or vesica piscis—adoring angels, one on either side, and below Him are grouped the apostles, looking upward.

At the bottom of this window is a quatrefoil enclosing a square medallion in which is shown St. Peter being nailed to the cross head downwards. In the semi-circular shape below are the donors presenting the window, to the left is Emperor Nero pointing to the scene in the right hand

Fig. 3. Twelfth Century Window from the Cathedral at Poitiers

* *The best examples are to be found at Poitiers, Chartres, Angers, S. Denis, and Vendome in France, and at Canterbury and York in England.*

semi-circle where St. Paul is suffering martyrdom. In the semi-circle above this square medallion is the empty tomb with the slumbering Roman soldiers, while in a square medallion to the left is the Angel of the Resurrection, and to the right, the three women who have journeyed from afar with spices.

The Byzantine influence may easily be traced in the general design and in the details of this window. But the most remarkable thing about it is its splendor of living, glowing color. No lover of color can stand before it without being thrilled with esthetic emotion to the very depths of his

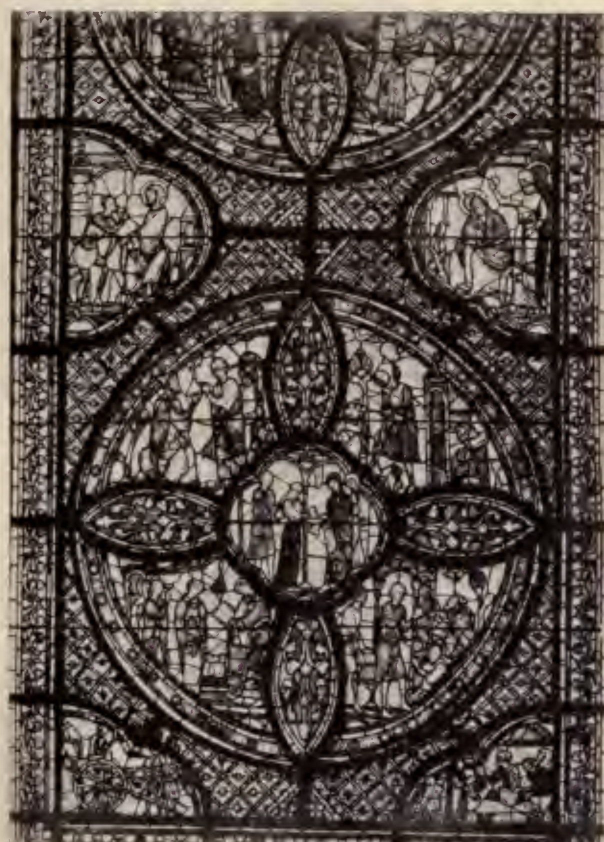


**Fig. 4. Thirteenth Century Medallion Window from the Cathedral at Chartres**

being. There is a most daring use of almost equal quantities of red and blue. And yet the proportions are so nicely adjusted, the qualities of the colors are so carefully selected and they are so well balanced by green and gold and white that one has no consciousness of a purple effect. Instead the ruby seems to become warmer and richer and the blue cooler and more intense because of their juxtaposition. And therein lies the marvel, as any one knows who has tried to combine large quantities of red and blue in the same design. The quality of the blue (which is described below) unquestionably is of significance in producing this rich harmony.

One instance of color arrangement is here worthy of consideration. The hair of the Crucified Christ in this window is blue. But being placed as it is on a white and gold halo and surrounded with such a large quantity of intense blue, the color of the hair is not noticed. It is safe to say that if it were any other color it would be noticed and would look wrong. On the other hand the hair of the Ascending Christ is a rich, brownish purple pot-metal. But the nimbus in this case is blue with a white cross. In such instances as this did the twelfth century craftsman show himself a master colorist.

Some of the outstanding characteristics of the design of twelfth century glass are the Byzantine-like details of the figures and drapery, the foliage and other ornament, which the reader may compare with the photograph on page 464. The straight saddle bars are wholly characteristic of this period, as are the square and circular medallions.

While the largeness of effect in the early windows is due first to the actual simplicity of the main lines of design it is also due to breadth and simplicity of color. The especial beauty and dignity of this work arises from the naive point of view of the mediæval glass worker. Instead of realism, he sought decorative effect, choosing splendor of color rather than stolid facts of tint or hue. The charm of color, then, though partly the result of age and corrosion is chiefly due to an instinctive realization of the beauty of the right proportions, combinations, and qualities of color. For example, there is a certain blue peculiar to this period which has been noted by all lovers of ancient glass. This color has been variously described as cobalt, cerulean, sapphire, azure, or a heavenly blue. It is a light rather than a dark blue and it has great intensity and purity of tone.* In conjunction with the warm ruby then used it never gave the unpleasant purple effect often found in later work.

The actual attainment of just the right combinations of colors seems all the more remarkable when we realize that the mediæval glass worker had no means of knowing how his window would look until it was finished and in place. Today we can assemble our windows before they are glazed and see them against the light by waxing them upon a large piece of plate glass, whereas in the early days they were unable to make sheets of clear glass large enough for this purpose.

### Early Gothic Glass—Thirteenth Century

The great mass of early Gothic glass is of the thirteenth century. Many fine examples are to be found both in England and in France, though of

* *This glass must have been of a remarkably fine quality for it seems to show practically no effects of corrosion.*

course principally in France, the birthplace of the art.

In passing from the twelfth to the thirteenth century one notices a certain loss of the restraint and sense of proportion which gives such dignity and refinement to the earlier work—but on the other hand a certain gain in facility of expression. The Byzantine influence is dying out. The thirteenth century man cares a little less for pure design and takes greater delight in story-telling in glass. He begins to elaborate his geometric medallion shapes, he crowds them with figures and introduces much more action into his subjects. But his glass is still strictly mosaic in character.

By comparing illustration, (Fig. 4)—a typical thirteenth century medallion window—with the two preceding illustrations, the changing tendencies in design may be noted. The medallions are here found to be no longer simple squares or circles and the heavy iron bars, instead of being either horizontal or vertical, are now shaped to the geometrical forms. Separate figure subjects are confined to the different compartments of the medallions and the medallions themselves have a geometrical pattern background. The Byzantine-like details of the figures and ornament have given way to a more naturalistic form of rendering. The attitudes of the figures are freer, the draperies less clinging and the folds not so angular. While details are still drawn in bold outlines a slight smear of paint is now often added to help give roundness or modelling to certain forms. The characteristic sapphire blue of the earlier work is now lacking and its place is taken by a deeper, greyer, less transparent shade. In late thirteenth century work the blue often merges toward purple and sometimes when in combination with ruby it takes on an unpleasant purplish cast, as has been previously mentioned. But the mediæval glazier was a colorist and he usually guarded against such a mistake by including in his color scheme sufficient green and gold and white to counteract this purple effect where it was not desired. Furthermore, the blue glass inserted by the modern restorer is often responsible for these inharmonious combinations of color.

The single lancets of the thirteenth century were filled in several different ways—either by single figure compositions, or by medallions, or a Jesse tree, or perhaps by grisaille patterns, or by plain white glass glazed with ornamental patterns. The clerestory was usually filled with huge figures under low topped canopies, surrounded by broad colored borders. The lower aisle windows, being nearer the eye were generally filled with medallions—figure subjects on a small scale. We also find the rose windows, sometimes over two lancets, as at Chartres and Bourges, and again in the transepts or the west end of the Cathedral.

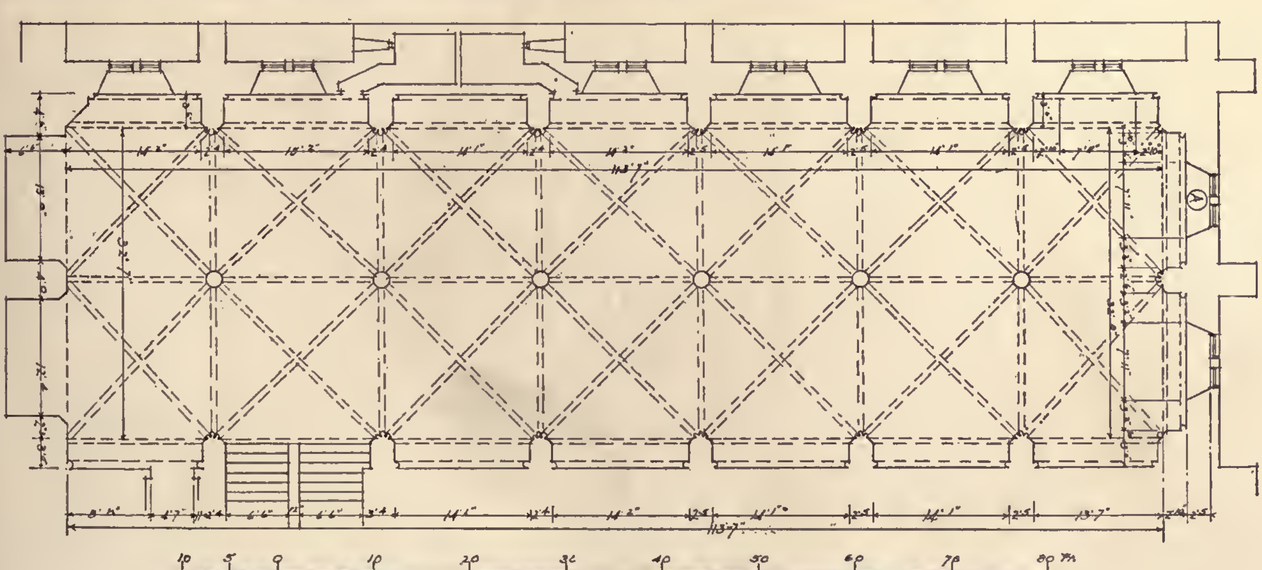
(*To be continued*)

**Entrance Gates, Chateau, Clantilly, France**
*(From a Photograph by R. M. Blackall)*

## Salle des Hotes, Mont St. Michel

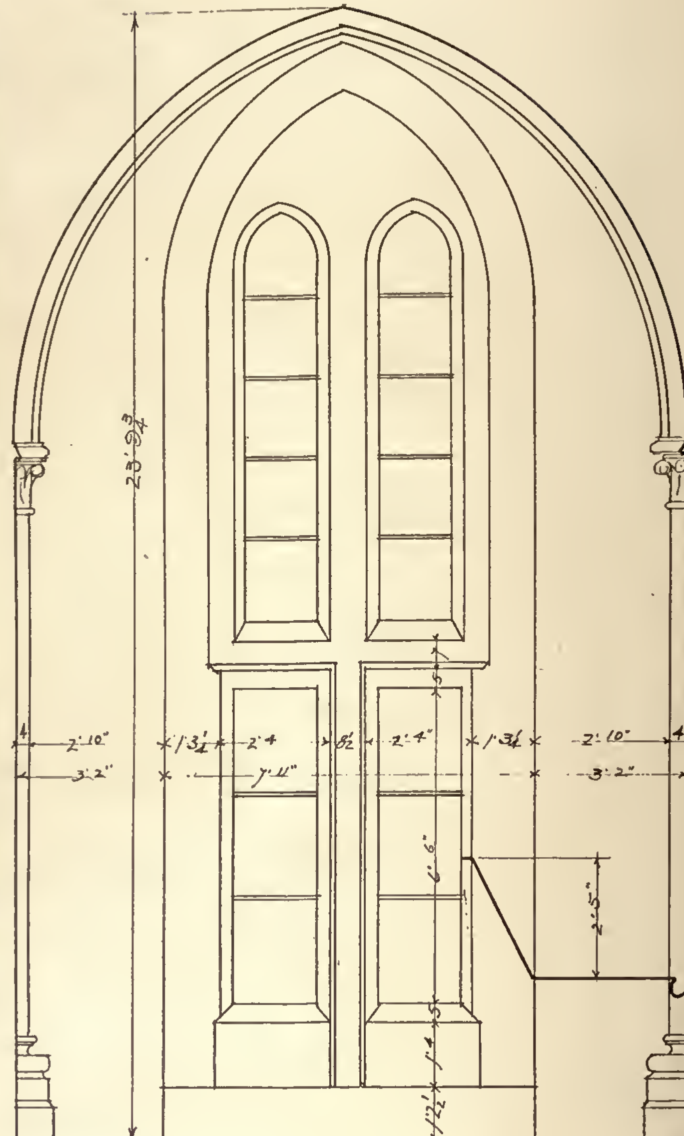
THE Merveille situated beside the abbey Church of Mont St. Michel comprises, among others, three rooms of pleasing proportions: The Salle des Chevaliers, the Refectoire and the Salle des Hotes. "They are almost the only monuments of what must be called secular architecture of the early and perfect period of Gothic Art 1200-1210."

This room of the guests, called sometimes the Refectory, is divided by a row of columns into two naves or aisles and is a room of rare elegance. Here the Abbot received his strangers of great distinction and gave them his splendid dinners. There exists of this period "no room of more grace, of better proportions, of more delicate mouldings or of more interesting detail." The entire wall of one side is composed of bays with beautiful windows. Although a restoration, it has been admirably done and one can still feel the spirit of the room when filled with guests, the tables well replenished and the Abbot, a congenial host, entertaining his friends.

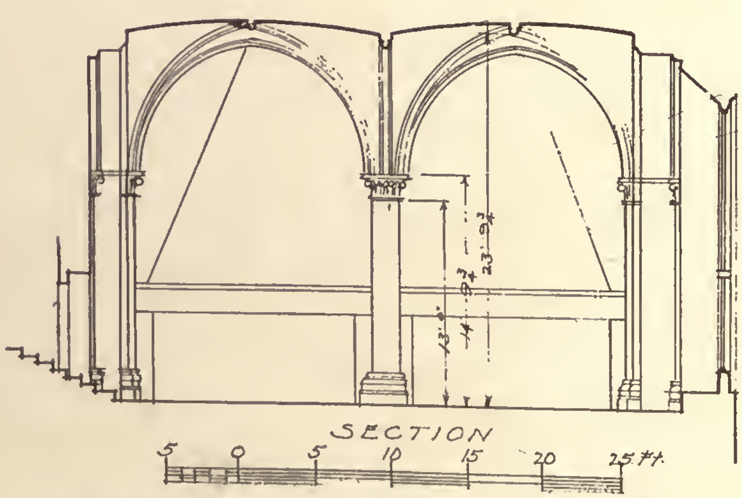


· SALLE · DES · HOTES · MONT · SAINT · MICHEL ·

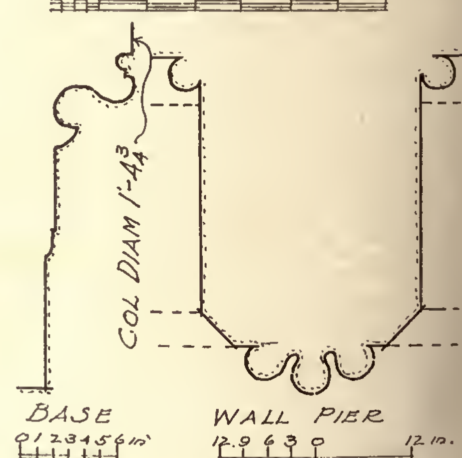
MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELLING SCHOLARSHIP




WINDOW (A)




SECTION




BASE

WALL PIER

·SALLE·DES·HOTES· MONT·ST·MICHEL·

MEASURED AND DRAWN BY R. M. BLACKALL, 35TH HOLDER, ROTCH TRAVELLING SCHOLARSHIP

*THE AMERICAN ARCHITECT, SERIES II. FRENCH AND ITALIAN DETAILS.*

# ·EDITORIAL·COMMENT·

MORE THAN A YEAR AGO, this journal editorially commented on the action of the Associated General Contractors in formulating and adopting a code of ethics. This code had all the dignity and forcefulness of a professional statement. Just why it should have been a source of surprise in many quarters that a group of men engaged in the building industry should seek to bind its members to a strict ethical procedure, it is difficult to understand.

In every great industry in this country there is need for some formal code that will ethically control. While there are unwritten laws in all business, many of them are more honored in the breach than in the observance. They lack in being specific, and in organized industries, or those industries that have set up an executive group to govern all its members, some fixed rule and guide is necessary. Without it there can be no punitive measures unless the offender so far oversteps the ethics of his work as to bring him within the range of the penal code.

It is in the enforcement of a properly drawn code of ethics that any industry may hope to have the confidence and respect of those who patronize it.

In this connection it is interesting to receive from the American Academy of Political and Social Science a large sized pamphlet treating of the Ethics of the Professions and of Business.

Modern social and business relations are, to quote from this pamphlet, as manifold as they are far-flung. In the building industry the aloofness between the architect, bound by a code of ethics, and the building and other organizations that co-operate with him in construction no longer exists. Building operations are now as finely developed and as skillfully carried forward, as is the practice of architecture. It is, therefore, difficult to understand just why the architect alone should have until recently been ruled by a code of ethics and the related industries only by custom or unwritten laws.

The pamphlet referred to appears at a most timely moment. The building industry ever since the armistice has, as far as it could, been working to purge itself of those undesirable elements that have no conception of ethical conduct and are absolutely disinclined to follow such a code if it existed.

The often spoken allusion that a certain man's word is as good as his bond is to-day acquiring a new significance as a business asset.

Good faith in business (ethical conduct) has been brought forcibly to the attention of the business world by an unprecedented cancellation of contracts during a period when prices were rapidly rising and falling.

It became disheartening to note what small amounts of money would induce men to break their word. No modern enterprise may successfully proceed where there is lack of confidence. The structure may not endure when good faith and confidence are lacking.

To quote again from this interesting pamphlet, which should be read by every man who is engaged either in a profession or in business:

"In the past few months, many business men have come to have a solemn sense of personal obligation to restore and maintain faith in the business world. For ethics is the basis for creative industry. The National Association of Credit Men has adopted a formal code of ethics. The Associated Advertising Clubs of the World has started a 'Truth in Advertising' Movement and has formed a Vigilance Committee to enforce the truthful presentation of business facts in advertising. The 'Commercial Standards Council' was federated out of many large business associations to suppress bribery and to secure better ethical standards in business. The Rotarians have set for themselves the gigantic yet inspiring task of creating a code of ethics in every craft and business group throughout the country. And even the editors of newspapers have assured responsibility for a public profession as to their standards of conduct.

"As business groups and crafts struggle to put into words the ideals that shall guide their members when meeting the business temptations peculiar to each craft or industry, they, too, must turn away from mere negations to the ideal. And this ideal, as with the professions, must be the public good. These business groups, however, will not find at hand the same means for enforcing high standards of conduct that the professions have. There will usually be no selective training for the work performed, though the demand for such training is increasing. But, on the other hand, business groups will have the powerful controlling agency of the organized market.

"The business world is now so complex that reliance must be its first watchword. And this can never be until the ideal of service controls the crafty impulse for profits."

For the regulation of business transactions between nations, corporations or individuals, there now exists a body of law effective and protective to a certain point. Beyond that the proper carrying forward on contract relations becomes one purely of ethics.

* * *

THE COURSE IN Plan Reading, recently conducted in Detroit under the auspices of the Michigan State Society, has proven to be of such great constructive value that it has been pronounced a decided success. Reference to this progressive movement on the part of the Michigan State Society has already been made in these columns. Now that the test of actual operation has proved the wisdom of the promoters, it may be a proper time again to direct attention to the great value of State organizations of architects, when efficiently conducted. There has, so we learn, been secured a fine spirit of co-operation between contractors in the building trades and members of the profession in Michigan.

It is interesting to learn from the report issued by the Committee of the Michigan State Society having these classes in charge, that a maximum attendance of 107 pupils comprised no less than 24 different grades of employment in the building trades. There were building superintendents, clerks, men from all of the various grades of labor, office managers, bookkeepers and salesmen.

The Associated Building Employers of Detroit, in a letter addressed to Mr. W. G. Malcomson, president of the Michigan State Society, express satisfaction at the outcome and include extracts from letters received from many men who attended the classes. One letter clearly states the exact value of such a movement. It says:

"As an experienced estimator who attended these classes, I want to say that I appreciated them for three reasons: One was, for their simplicity, although it must have entailed much thought and labor on the part of the architects in preparing them. Second, for a chance to get the architects' personal viewpoints, which many of us lack or do not have the opportunity to receive, and third—a better understanding of the other fellow's obstacles in construction work."

A House by Bulfinch at Pigeon Cove
From the original painting by Tom P. Barnett, Architect


VIEW OF ANNEX AT NORTHEAST CORNER OF MADISON AVENUE AND TWENTY-FOURTH STREET

ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT

*(Note: Photograph taken looking East from Madison Square. The corner of the Metropolitan Tower is seen at the right)*

VIEW OF BRIDGE ACROSS TWENTY-FOURTH STREET

ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT

DETAIL OF WINDOW ON TWENTY-FOURTH STREET

ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT


MAIN ENTRANCE OF AUDITORIUM ON MADISON AVENUE

ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT

VIEW IN AUDITORIUM

ENTRANCE LOBBY OF AUDITORIUM

ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT

4725

EVENING NEWS WAREHOUSE BUILDING, DETROIT, MICH.

ALBERT KAHN, ARCHITECT

472c


HOUSE OF A. A. FOWLER, ESQ., EAST 71ST STREET, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

DRAWING ROOM MANTEL


DETAIL OF PRINCIPAL ENTRANCE

HOUSE OF A. A. FOWLER, ESQ., EAST 71ST STREET, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

4728


DELTA KAPPA EPSILON CHAPTER HOUSE, ANN ARBOR, MICH.
GEO. W. MAHER & SON, ARCHITECTS
*(From the Chicago Architectural Exhibition)*

4729


HOME OFFICE, ILLINOIS LIFE INSURANCE CO., CHICAGO, ILL.
HOLABIRD & ROCHE, ARCHITECTS

*(From the Chicago Architecturol Exhibition)*

CHAPEL FOR PRINCETON UNIVERSITY

CRAM & FERGUSON, ARCHITECTS

*(From the Chicago Architectural Exhibition)*

472 12

ENTRANCE DETAIL, A. W. SHAW BUILDING

D. H. BURNHAM & CO., ARCHITECTS

*(From the Chicago Architectural Exhibition)*

RESIDENCE, SUNSET ROAD, WINNETKA, ILL.
JAMES ROY ALLEN, ARCHITECT
*(From the Chicago Architectural Exhibition)*

4720

STUDY OF NEW BUILDING
FOR THE HARTFORD CONNECTICUT TRUST CO.

B. W. MORRIS, ARCHITECT

*(From the Chicago Architectural Exhibition)*

BARKER MEMORIAL BUILDING, HOME OF THE FRIENDLESS, PEORIA, ILL.

HEWITT & EMERSON, ARCHITECTS

*(From the Chicago Architectural Exhibition)*

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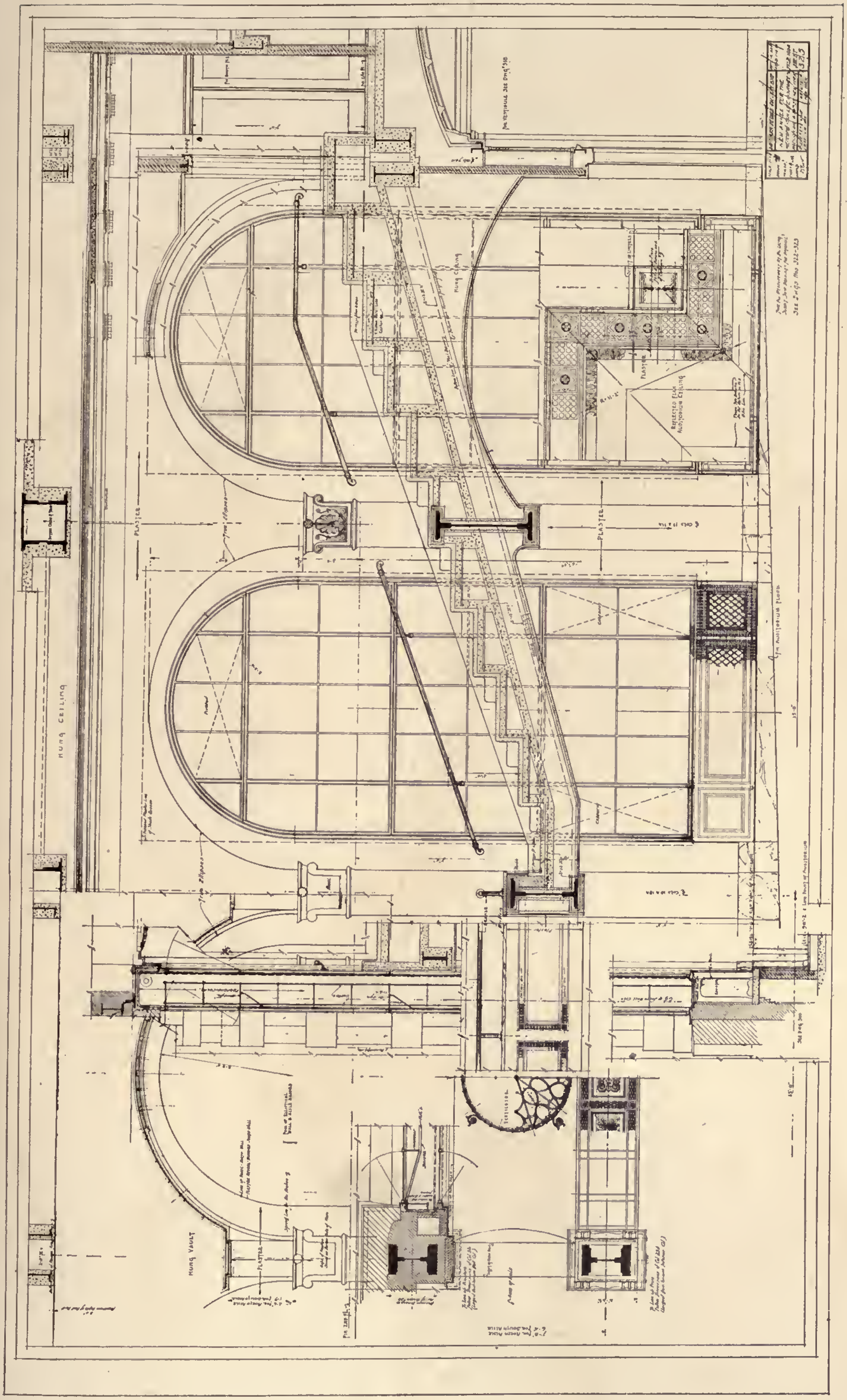
THE JOHN CRERAR LIBRARY BLDG., CHICAGO
HOLABIRD & ROCHE, ARCHITECTS

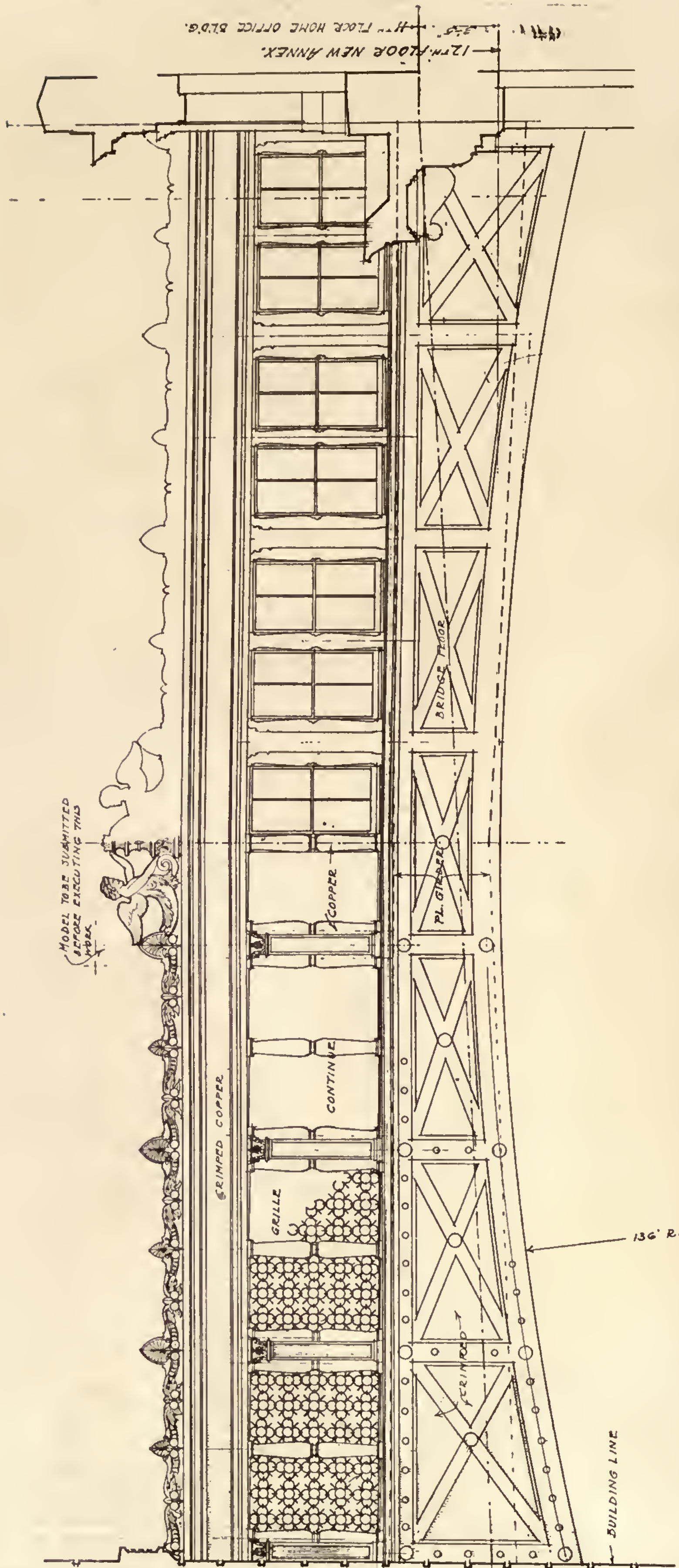
*(From the Chicago Architectural Exhibition)*




SECTION OF GALLERY IN AUDITORIUM

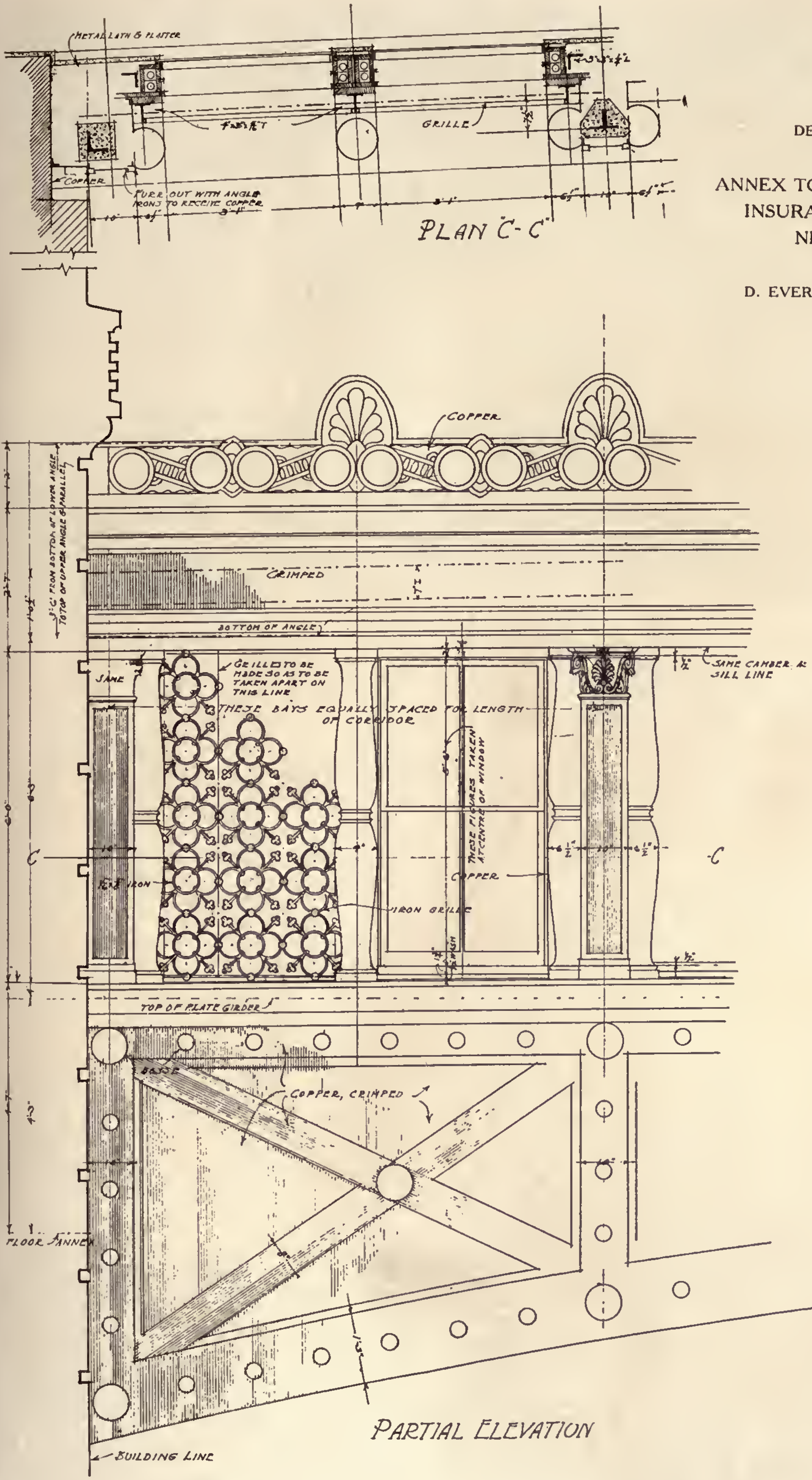
ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT




ELEVATION OF BRIDGE ACROSS TWENTY-FOURTH STREET CONNECTING THE HOME OFFICE BUILDING WITH THE NEW ANNEX ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT




DETAIL OF BRIDGE

ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

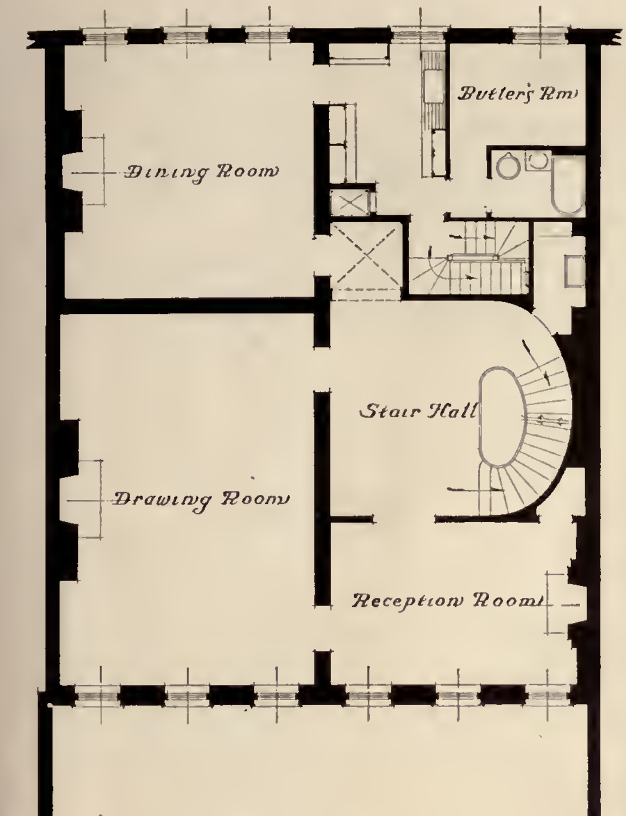
D. EVERETT WAID, ARCHITECT


VIEW IN AUDITORIUM

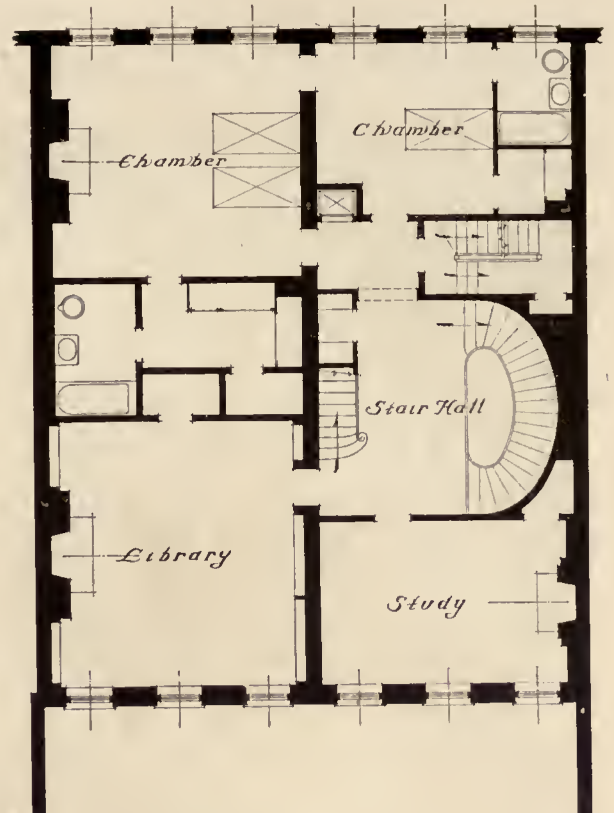
ONE-HALF ELEVATION OF MADISON AVENUE FRONT

ANNEX TO METROPOLITAN LIFE INSURANCE CO. BUILDING, NEW YORK CITY

D. EVERETT WAID, ARCHITECT




· FIRST FLOOR PLAN ·




· SECOND FLOOR PLAN ·

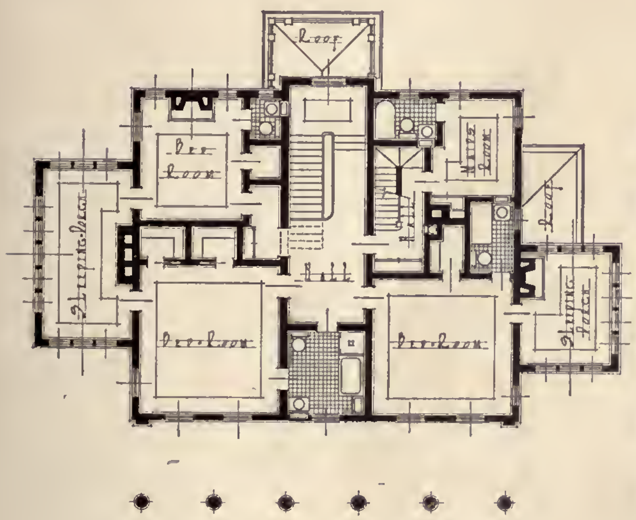

HOUSE OF A. A. FOWLER, ESQ.
EAST 71ST STREET,
NEW YORK

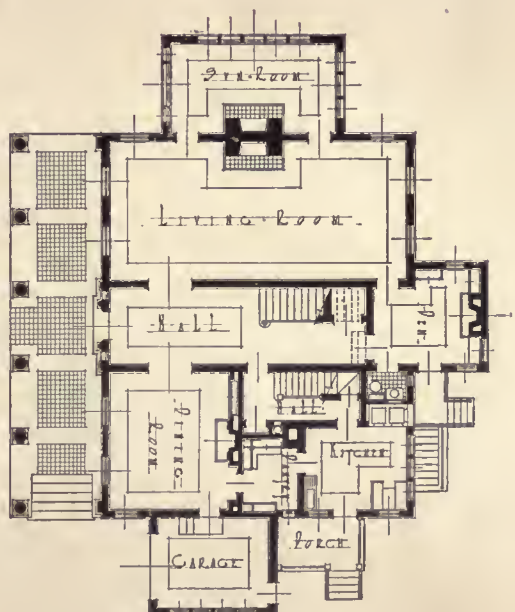
MOTT B. SCHMIDT
ARCHITECT

(See Plate Section for other views)

HOUSE OF S. M. COWGILL, ESQ., TERRE HAUTE, IND.
JOHNSON, MILLER & MILLER, ARCHITECTS

DINING ROOM






HOUSE OF S. M. COWGILL, ESQ., TERRE HAUTE, IND.

JOHNSON, MILLER & MILLER, ARCHITECTS

# SOCIETY OF BEAUX-ARTS ARCHITECTS

DIRECTOR OF THE INSTITUTE, LLOYD WARREN

ARCHITECTURE, RAYMOND M. HOOD SCULPTURE, JOHN GREGORY

INTERIOR DECORATION, ERNEST F. TYLER MURAL PAINTING, ERNEST C. PEIXOTTO

OFFICIAL NOTIFICATION OF AWARDS — JUDGMENT OF MARCH 14TH, 1922 — FIRST PRELIMINARY COMPETITION FOR THE 15TH PARIS PRIZE.

## PROGRAM

The Annual Committee on the Paris Prize proposes as subject of this Competition: "A PRIVATE LIBRARY"

A wealthy man is to build a private library properly to house his large collection of valuable books and manuscripts. As he intends a restricted public to have access to the collection he has bought a plot at the rear of his city residence with a 50 foot frontage on another street from which the public will enter. The plot, all of which will be utilized for the building, is 100 feet deep.

There already is a court in the rear of his residence. Through this court a low, covered passage will give him access to the building. The court will also light the rear windows. This passage and court are not in the program.

We have therefore a site 50′ x 100′ for the building, which should be designed in a residential rather than a public character. One great room houses his collection. In addition to the court entrance is the public one from the street, opening into a small vestibule which gives access to a coat room and librarian's office. The great room, of sufficient height to be impressive, is to be lighted by windows on the court and on the street. On a side wall there should be an important fireplace.

*Jury of Award:*—J. G. Rogers, C. H. Aldrich, R. M. Hood and H. O. Milliken, Chairman.

*Number of Drawings Submitted:*—118.

AWARDS:—

PLACED FIRST—Third Medal:—A. E. Egeressy, "T" Square Club, Philadelphia.

PLACED SECOND—Third Medal:—E. L. Babitsky, John Huntington Poly. Inst., Cleveland.

PLACED THIRD—Third Medal:—E. W. Burkhardt, Columbia Univ., New York.

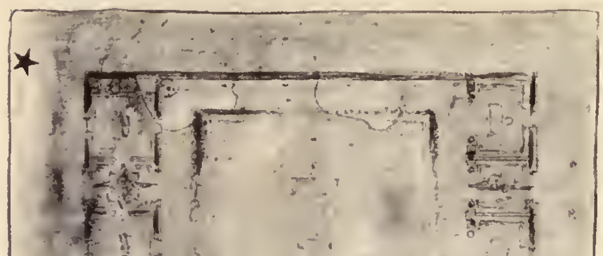
PLACED FOURTH—Third Medal:—R. Bailey, care of J. R. Pope, Arch., New York.

PLACED FIFTH—First Mention:—H. S. Bent, Univ. of Penna., Philadelphia.

PLACED SIXTH—(First Alternate)—First Mention:—A. G. Clay, Yale Univ., New Haven.

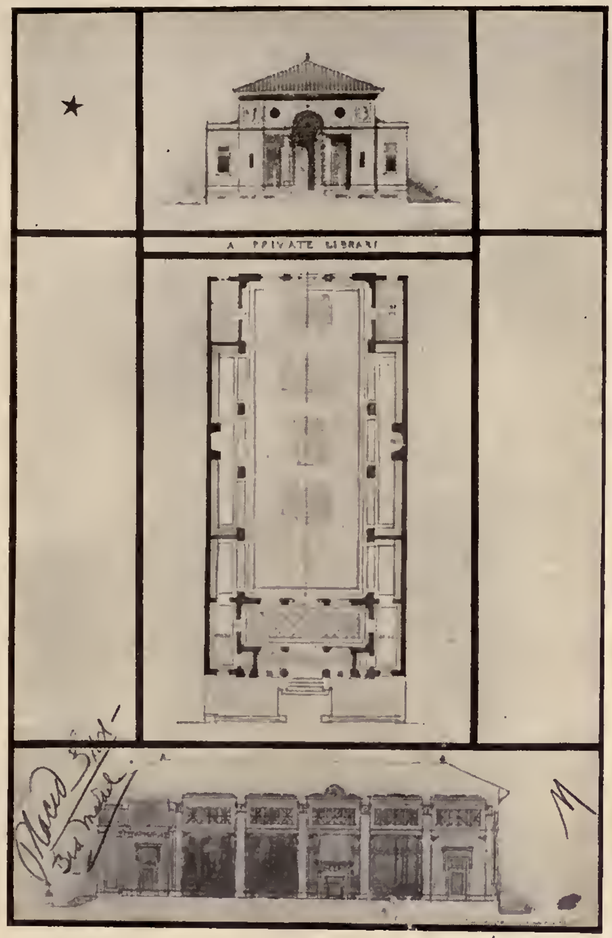
PLACED SEVENTH—(2nd Alternate)—Third Medal: —R. H. Bowden, Columbia Univ., New York.

MENTION:—A. L. Muller, Columbia Univ., New York; O. M. Olsen and W. M. Burke, Carnegie Inst. of Tech., Pittsburgh; E. M. Loye, Harvard Univ., Cambridge; J. F. Gunther, Mass. Inst. of Tech., Boston; G. Hacker, Atelier Sibley, Palisade; W. K. Macomher, Univ. of Minnesota, Minneapolis; H. S. Kelly, Yale Univ., New Haven.



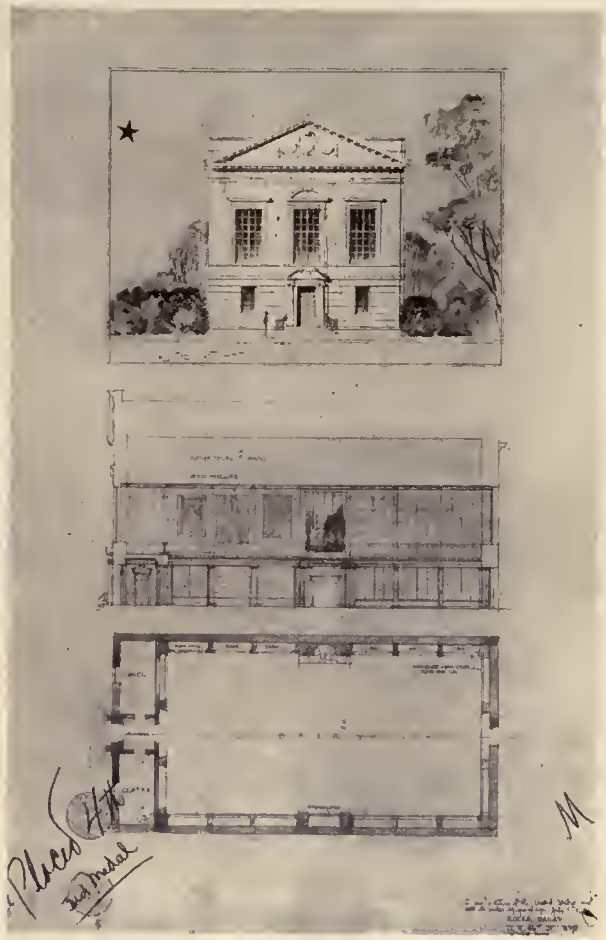
A. E. Egeressy "T" Square Club, Philadelphia
Placed 1st—Third Medal

E. L. Babitsky John Huntington Polytechnic Institute
Placed 2nd—Third Medal



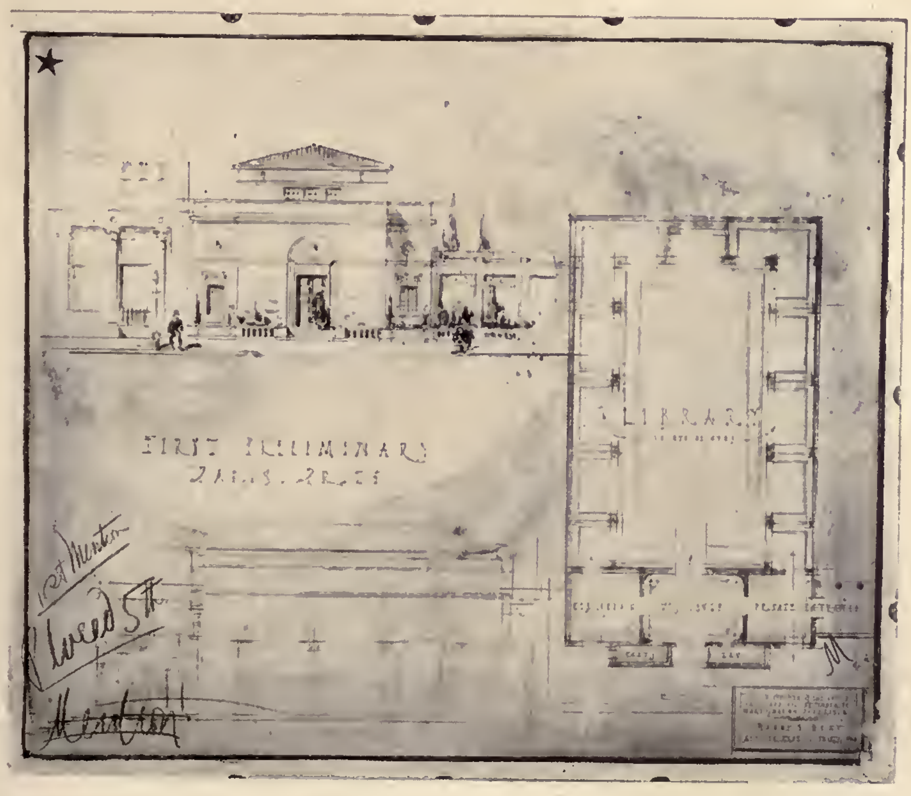

E. W. Burkhardt — Columbia University

Placed 3rd—Third Medal




R. Bailey — care of John Russell Pope

Placed 4th—Third Medal




H. S. Bent — University of Pennsylvania

Placed 5th—First Mention

FIRST PRELIMINARY
PARIS PRIZE

STUDENT WORK
SOCIETY OF BEAUX-
ARTS ARCHITECTS

# LEGAL DEPARTMENT

Conducted by

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

A FEW weeks ago I had the pleasure of lecturing to the students of the School of Architecture of the Massachusetts Institute of Technology. The member of the faculty who introduced me said that he had recently talked with an architect, and had asked the latter whether he had read my book on the Law of Architecture and Building. The architect replied, according to the story, "My Lord, No. If I read that I wouldn't dare practice at all!"

I quite understand the feeling which prompted this rejoinder. It is not at all an unnatural one. My main purpose, in my writings and talks to architects, having been to bring home to them the things in general which they should not do, it is not to be wondered at that this architect should have the mental reaction which he did. The summarization of legal cautions to architects naturally results in a series of "Dont's" and when one reads them one naturally receives the impression that they are more contagious than perhaps they really are.

The "Dont's" which an architect must consider and observe are, many of them, vitally and fundamentally important, but nevertheless, if properly considered, they fall into comparatively few and simple classifications. In the main, it will be found that they group themselves under the general headings dealing with the compensation of the architect, his proceedings as the agent of the owner, and his duties as the superintendent of construction.

Conversely, there are many things which an architect must remember "to" do and these affirmative injunctions can similarly be included under a few main headings.

No architect should try to store his mind with the exact knowledge of everything which he cannot do, and of everything which he must do—unless indeed he have a mind which is very far from average. What the ordinary architect can do, however, and can do very readily, is to fix the main danger areas in his mind sufficiently to warn him when he approaches them, and enable him to keep to the more tested and travelled thoroughfares. This he can do quite easily and without acquiring the pessimistic frame of mind of my Massachusetts friend.

It is not necessary that he know, to protect himself, exactly what he should do in a given case. It is not necessary that he know the precise wording which he should adopt in a letter or contract. It is not necessary that he know to just what limits he can go in approving extras or authorizing changes in the plans or in the specifications. It is sufficient if he knows that in any one of these respects, he is on dangerous ground. He can then get a proper contract prepared or at least use the Institute form, or seek competent advice as to his rights and be guided in his conduct accordingly.

Some people have a genius for doing things first and seeking advice afterwards—some on the contrary are inclined to seek advice on every point, important and unimportant alike. Between these two extremes lies the common sense rational road to be followed by the ordinary architect of today. When he is on familiar ground over which he has travelled before, let him go on at full speed. When he is on new and untested ground, notwithstanding that the prospect be fair, let him go more slowly and test, by proper advice if need be, the path that lies ahead.

With a few main rules in mind, experience will do the rest. The architect will find that, without great difficulty, he will shortly be able to sense the points in which danger is involved in ample time to avoid them altogether or, at least, to receive advice and be in a position to handle them, on a basis which will not expose him to liabilities or to commitments which he does not intend to assume.

An architect cannot be his own lawyer, any more than a lawyer can be his own architect. What he can do, however, is to acquire a sufficiently clear idea of the basis on which his rights and liabilities rest to know when he needs legal advice, and when he does not need it.

If he arrive at this point he will have travelled at least three-quarters of the way along the road leading to comparative safety from unnecessary loss and entanglements.

## LEGAL DECISIONS

THE instructions to bidders included a statement to the effect that the owner had contracted for all of the structural steel to be erected within eight weeks' time after the foundations were prepared and ready to receive it. The contract for the steel construction itself provided that the steel erection should begin within nine weeks after the complete plans were ready and delivered and the foundations ready to receive the steel and that the work should be carried on and entirely completed within eight weeks. The instructions to the bidders also provided that in the event of any delay in erecting the steel there should be a corresponding extension of the time allowed to the general contractor but that he would not be given any claim for damages thereby.

The work of erecting the steel commenced within a few days after the time that the foundations were ready.

The surety on the bond of the contractor urged on the foregoing facts, that there had been a false statement in the instructions to bidders and that the surety was thereby relieved from liability. The Court held that this position was untenable and that there was no false statement which would relieve the surety of its obligations. It further appeared in the proof that a bond had been given to secure the performance of the contract and that the bond provided that no liability should attach to the surety by reason of any default on the part of the contractor unless the one in whose favor the bond was given should, within thirty days' time after he received knowledge of the default of the contractor, give proper notification of his claim to the surety. This notice was not given until long after the time for the completion of the work had expired, but was given promptly following the first notice and certificate which the owner received from the architect to the effect that the contractor was improperly delaying the work.

It was held that the question of default on the part of the contractor was one which the architect was called upon in some measure, at least, to determine and that inasmuch as the notice was given promptly following the certification by the architect of the contractor's delay and consequent default, and the thirty days from the giving of this certificate had not expired when the surety was notified of the default, the notice to the surety was given in due time and the surety was not released.

The contract further provided that extra work should be fixed by agreement of the parties and that certain additional floors in the structure should be finished at the election of the owner on or before a specified date. When this date was reached, the steel construction by another contractor had not yet been completed. A long time thereafter, an agreement was made for the completion of these floors at the price originally fixed in the contract, plus, however, 5% additional, and with the proviso that this work was to be done before the contract was completed. The Court held that this was not such an alteration of the contract as would operate as a release of the obligations of the surety and that the surety could not successfully claim that it was such.

The contract further provided that the owner, on the default of the contractor, might complete the work and that in the event that he did complete the work under this provision of the contract, the expense incident to his doing so, should be audited and certified by the architect and that the certificate of the architect rendered after he had completed this audit should be conclusive.

The bond of the contractor provided that the surety should not be liable in any action instituted later than a specified date and it appeared that the building had not on that date been completed and that, therefore, a certificate covering all items could not be given. No objection was raised on the trial to the fact that this certificate was not produced, but the question was raised for the first time on the appeal. The Appellate Court held that the failure to produce the certificate did not abate the action and did not bar a recovery against the surety on the bond.

The action in this case was brought against the contractor, against the surety for the contractor and against all parties having or claiming liens, and it was asked that the rights of all parties be determined. The Surety Company made a motion to require the plaintiff to elect whether he would proceed solely against the Surety Company or would proceed solely against the other defendants and asked that in the event that he refused so to elect, the cause of action against the other defendants be stricken out. This motion was overruled by the Trial Court and the other defendants did not complain of this action by the Court. The Appellate Court held that, under the circumstances, the motion had been properly overruled.

It was further provided under the contract that the contractor should purchase all of the materials and should employ all of the labor necessary to the job but that he should not purchase any materials except in small quantities, not exceeding $350.00, without submitting prices and quantities to the owner and securing the approval of the latter. The contract required the owner also to advance from time to time to the contractor the monies necessary to meet the payrolls and required the owner to pay all bills for material.

It further provided that under certain circumstances the owner might determine the rate of wages to be paid. The Court held that, under these conditions, the contractor was, in effect, the agent of the owner in the purchase of materials and that the owner was liable for the purchase price of materials purchased by the contractor and used in the construction of the building, and that this liability was not affected by the fact that liens for the materials so furnished had not been filed in time.

*Cowles v. Mardis Co.* (*Supreme Court of Iowa*, 181 *N. W.* 872).

# DEPARTMENT OF SPECIFICATIONS

Concrete Specifications (*Continued*)

IN the previous article in this department the waterproofing of building foundations was the last subject discussed, and that discussion was somewhat general. The following notes in particular should be of value to the specification writer.

In "Modern Methods of Waterproofing" by Myron H. Lewis, C. E. there appears the following discussion:

NECESSITY FOR WATERPROOFING—In many of the forms of construction work to which concrete is so admirably adapted, its use brings with it one inherent fault—a fault for which remedies have long been sought but which until recent years have not been found in a practical form to suit all the varied needs of modern construction. This striking fault of concrete work is its great thirst for water, a fault which varies in its gravity according to the proportioning and the mixing of materials and to the nature of the structure, it frequently being the cause of extremely serious difficulties. Of all the opposing forces which constructors have had to combat from time immemorial, none has exceeded in its power for evil the unwelcome intrusion of water, and building materials which in their nature favor such intrusion must suffer in value to the extent of their permeability or absorptive power.

The fact that in practice concrete is frequently found to be porous and permeable has been one of the leading checks in its rapid development. Volumes have been written on how the ingredients might be mixed to produce a water-tight concrete but we might as well seek to solve the problem of perpetual motion as to try to mix cement, sand and stone so as not to absorb water.

If we could examine a section of concrete under a powerful microscope, it would appear to us like an immense sieve through which fine particles of water flow with more or less freedom.

We have seen water rise up through concrete walls for many feet, and it will rise until the weight of the water absorbed is equal to the capillary attracting force.

If concrete is mixed rich and mixed wet, a high degree of impermeability can be secured. Mixing rich imposes greater barriers to the passage of water; mixing wet minimizes the formation of blow holes by displacing much of the extrained air, but neither mixing rich nor mixing wet destroys the "capillary positive" property of the concrete mass. Its absorptive capacity has been largely decreased, but its attraction for moisture has, however, not been eliminated; thus the water-tightness procured by rich and wet mixtures, however theoretically correct the proportions might be, is one of degree only, a degree sometimes approaching the ideal but never reaching it. We cannot expect that a mixture made of cement and stone, each of which is in itself "capillary positive," or water-attracting, can become absolutely proof against the absorption of water by the mere act of mixing, unless indeed, the operation had produced some phenomenal change in the very nature of the constituent materials. By care and diligence a mixture may be produced which is sufficiently close-grained to prevent the free transmission of water, prevent it sufficiently, in fact, to be all that is required in many forms of construction work. But where water absorption, besides water penetration, is to be absolutely prevented, no degree of mixing, no richness of mixture, will altogether answer the purpose; and yet in many of the forms in which concrete enters our modern buildings, it is resistance to water absorption that is required. Not merely water-tightness in the ordinary sense of the word, but resistance to the ceaseless endeavors of atmospheric moisture to find its way by capillarity through porous bodies. Some counteracting influence to this tendency of ordinary concrete to take up water by capillarity is, therefore, what is required when dampness is to be eliminated.

It is true that concrete exposed to the free passage of water becomes after a time so clogged up by fine silt present in the water that the permeability is greatly reduced; and Hagloch states that concrete-block buildings exposed to the weather become water-tight in from three to twelve years, a fact which we must likewise ascribe to the clogging of the surface of the blocks by atmospheric dust deposited by rain, and which remains after evaporation.

Modern engineering or architectural practice should certainly not sanction a practice of waiting for the erratic and uncertain hand of time where it is essential to secure water-tightness and damp-proofness in concrete structures, and in the meantime to incur the annoying consequences that always accompany damp and leaky structures; and yet this is precisely what is being done in numberless instances by those who refuse to realize the importance of water-tightness in concrete work, or while realizing it, are willing through motives of false economy, to gamble with the future—nearly always at their loss.

The number of mistakes made by inadequate provision for waterproofing, and their costly consequences, running into thousands of dollars, should serve as object lessons to those who have the design of concrete work in hand and the same degree of attention and study should be given the subject of water-tightness as that given to other details of construction.

IMPORTANCE OF ADEQUATE INSPECTION—Thorough inspection is particularly essential in the bituminous shield or membrane method, where the waterproofing is to be covered or backed up by protecting masonry or by other material and thus cannot be readily reached for repairs. In dampproofing exposed walls of buildings by application of an asphaltic coating on the interior surface of the walls, inspection should also be particularly rigid as failure means the removal of the plaster covering. Furthermore, the difficulty in tracing the sources of leakage when the waterproofing is covered up makes the repair work uncertain and costly.

On large works particularly, materials specified for waterproofing purposes should be subject to the same degree of inspection and tests as other construction materials. There is nothing easier than the substitution of poor materials for good ones by irresponsible contractors or dealers, particularly when the price is much below the standard price for light materials. So many of the coal tar and asphaltic preparations look alike that the quality of the material delivered can be ascertained only by subjecting them to specified tests fixed according to the character of the work in hand. Waterproofing felts and other fabrics should also be examined for defects, and powders and other materials to be introduced as a part of concrete work should be tested and compared with samples obtained, to see that the material ordered is actually delivered.

So many instances of failures due to various causes have occurred that it might be well, before proceeding to the detailed consideration of various systems of waterproofing, to review briefly the important points to be considered in general to obtain permanency and efficiency.

The following general principles, if carefully followed, will result in economical, durable, and efficient work:

### General Principles to be Followed in All Waterproofing

1. In deciding upon a system of waterproofing for any particular structure, study the individual conditions of the problem in hand. Consider the location, climate, service, nature of soil, foundation, and all other pertinent data and adopt a plan best suited for the necessities of the case.

2. The portions of the structure to be treated must be so designed and prepared that the waterproofing may be properly applied thereon, allowing sufficient working room for securing good surfaces and providing for adequate drainage where water pressure is to be taken care of during construction.

3. Complete, unbroken continuity of the waterproofing stratum must be obtained, being allowed for in the design and insisted upon in the construction. Any breaks in the continuity of the work will surely be disclosed in time by leaks.

4. The material as well as the design, should be suited to the individual conditions of the work, and the delivery of the material ordered should be proved by tests and comparison with samples previously submitted.

5. Where the designer or owner is not familiar with this class of work, alternative plans and estimates may be called for from several responsible concerns and submitted to an impartial architect or engineer qualified to pass judgment on same.

6. Where work is to be done by the immediate purchaser of materials, complete and explicit instructions should be obtained from the dealer upon written request and in conformity with the conditions outlined by the purchaser and these instructions should be rigidly followed.

7. The labor employed in all waterproofing should be intelligent and careful and wherever possible, experienced. The most satisfactory way is to have materials applied by a representative of the manufacturer under a guarantee and under supervision of a competent inspector.

8. In all large jobs a competent inspector should be present from the inception of the work to its completion, and nothing should be done, and no tampering or interference allowed without his knowledge.

### The Membrane Method of Waterproofing

The term "membrane method" refers to an elastic, continuous, bituminous, impervious sheet or membrane which completely surrounds the structure to be waterproofed. This method is adapted principally to waterproofing structures in course of erection, particularly those portions below ground, such as subways, tunnels, building foundations, retaining walls, etc. It is not so well adapted to waterproofing structures already erected or to remedy leaky conditions in same, or to dampproofing exposed walls of structures. Other methods must be adopted for these conditions and these will be considered later.

MATERIALS—The materials employed in the membrane method of waterproofing are: coal tar pitch, applied hot; commercial asphalts, applied hot; specially prepared asphalts and compounds sold under various trade names, applied cold; and asphalt mastic, applied hot. When merely dampness is to be excluded, any of the first three named materials may be employed, two or more coats being put on to insure thoroughly covering the surfaces. When water is to be excluded these three materials are employed as binders in conjunction with either of the following fabrics: tarred felt; asphalted felt; burlap (ordinary); burlap (saturated with asphalt); combinations of felt and burlap.

The number of plies to be used depends upon the local conditions and the head of water to be resisted. The specification writer should be careful to observe that the number of ply thicknesses required by conditions is specified.

QUALITY OF MATERIAL—Both the cementing materials and the fabrics, in order to be serviceable for waterproofing operations, must be elastic and durable and retain these properties through the range of temperature to which they may possibly be subjected after being placed in the work.

In order that materials of a desired quality be obtained, certain requirements are usually outlined in the specifications, and it is incumbent on the inspector to see that these requirements are fulfilled as far as it is within his power to do so. Laboratory tests should be made on the material delivered on the work to determine whether the physical and chemical requirements are satisfied.

APPLICATION OF MATERIALS IN THE MEMBRANE METHOD—In the application of the materials, certain fundamental requirements must be fulfilled upon which the final success of the work will largely depend, and it is the duty of the inspector to see that such requirements are fulfilled. These requirements may be conveniently classed under headings, as follows: Preparation of surface; continuity of work; protection of waterproofing.

PREPARATION OF SURFACE—It is difficult to make a bituminous sheet adhere to a surface that is either too rough, too wet, covered with dirt or foreign matter, or possessing too fine a glaze due to richness of cement surface. It is therefore necessary to see that: all dirt and foreign matter are removed before waterproofing is applied; that an adequate drainage system is installed and maintained, and that the wall is dry when the waterproofing is applied; in case complete dryness cannot be secured, that a layer of felt in addition to those called for in the specifications is first laid against the surface; the surface should be smoothed off with a trowel if too rough; in case wall is of concrete, that the concrete be thoroughly set; in case wall is covered with a fine skin of cement, that it is roughened up to insure sticking of material; sharp projections on the masonry should be removed or they will puncture the waterproofing; metal surfaces should be dry and clean, free from rust, loose scale and dirt. If previously coated with oil, same should be removed with benzine or other suitable means. Warming may be accomplished by heated sand, which is removed as material is applied.

CONTINUITY OF WORK—Lack of continuity will be fatal to any waterproofing work, as water is sure to find its way through any breaks, however small.

PROTECTION—After the waterproofing has been put in place, it must be properly protected against injury from any cause whatever. Injury may be avoided by placing against the waterproofing a protecting layer of cement mortar mixed in the proportions of one part cement to two and one-half parts sand, placed as soon as possible after the laying of the waterproofing, not exceeding twelve to twenty-four hours. When brick work is placed against waterproofing on vertical walls, a slight space may be left for slushing in with mortar to avoid puncturing. The brick should not be rammed up against the waterproofing sheet.

### The Integral Method of Waterproofing

The term "integral" refers to those methods wherein the waterproofing material becomes an integral part of the structure treated. It includes:

1. The various methods employed in making concrete and masonry impermeable *per se*:
   By properly grading materials
   (a) The addition of special materials to the water used in tempering the cement, or
   (b) The addition of special materials, dry to the cement, or
   (c) The use of a cement waterproofed in the process of manufacture.
2. The application of materials thus prepared as a plaster or coating to the surfaces to be treated, such coating becoming an integral part of the structure.

The integral method is distinguished from purely surface applications in that the latter are applied as a paint, and while some of the materials penetrate to a considerable extent, periodical renewal is required when exposed to the elements, although with some of the materials, renewals may not be required for many years.

ADAPTABILITY OF THE INTEGRAL METHOD—The integral method of waterproofing, as above outlined, is adapted to treatment of numerous conditions. In the form of the coating, it is particularly adapted to remedying leaky conditions in sub-structures already erected, where excavations would be too costly and inconvenient.

Although the logical place to apply waterproof cement coatings is on surfaces exposed to the water, yet owing to the inaccessibility of the outer surfaces for examination and repairs, the coatings are applied to the inner surfaces. It will withstand any ordinary water pressure in this position if the work is properly executed.

In many cases, either the membrane or integral methods may be employed with equally good results and a selection of type must be made by the designer, after comparing their cost.

ADDITION OF WATERPROOFING MATERIAL TO THE CONCRETE—Concrete, even when mixed according to the most rigid rules and under the most competent supervision, often falls short of its purpose in resisting water penetrations. This condition, and the inherent attraction of concrete for water, has resulted in the

(*Concluded on page* 498)

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## ARCHITECTURAL ACOUSTICS—II

### The Nature and Reduction of Office Noises

BY PAUL E. SABINE*

FROM the results of the investigations made in the Sound Chamber, the total absorbing power of the room and its contents may be easily computed as well as the total sound energy produced, measured in terms of the minimum intensity which can be heard. Referring to equation (*5*) and letting $t_1$ and $t_2$ be the times of reverberation when the initial energies are $E_1$ and $E_2$ respectively, we have

$$at_1 = \frac{4V}{v} \log_e \frac{E_1}{V}$$

$$at_2 = \frac{4V}{v} \log_e \frac{E_2}{V}$$

subtracting

$$a = \frac{\frac{4V}{v}\left[\log_e \frac{E_1}{V} - \log_e \frac{E_2}{V}\right]}{t_1 - t_2} \quad \text{or}$$

$$a = \frac{4V}{v} \frac{\log_e\left(\frac{E_1}{E_2}\right)}{t_1 - t_2} = 2.30 \frac{4V}{v}\left[\frac{\left(\log_{10}\frac{E_1}{E_2}\right)}{t_1 - t_2}\right]$$

As has just been shown, the ratio of the sound energies is equal to the ratio of the energies of the impacts, so that the expression in the last equation within the parenthesis is the slope of the straight line in Fig. *2*. For the room in the standard condition, this slope is .793. The volume of the Sound Chamber is 289 cubic meters, and the velocity of sound at the temperature at which the experiment was performed is 341 meters per second. Hence the absorbing power of the room

$$a = \frac{2.30 \times 289 \times .793 \times 4}{341} = 6.18$$

With the felt in the room, by a similar computation

$$a' = 9.42$$

Equation (*6*) furnishes an independent means of determining $a'$. Using this relation, and the value of $a$ given above, the average value of $a'$ computed from the times for the five different intensities of the impact, is 9.52, an agreement which is quite good in view of the fact that a difference of .04 secs. in the timing will produce the difference in the two values of $a'$.

The reader familiar with the work of Professor Sabine will recognize the correspondence between this experiment and his "Four Organ Pipe" experiment for the determination of the absolute rate of decay of sustained pure tones within a closed room. The extension of the method to short impulsive sounds without musical characteristics is of scientific interest since it affords a means of quantitative study of such *noises,* a problem which has not hitherto been undertaken by physicists.

Having established the validity of our fundamental equation for impulsive sound from one source, it becomes of interest to extend the investigation to sounds of this character from other sources. Since the absorption co-efficients of a single material may vary widely with the pitch, it may well be supposed that a given material would exhibit markedly different absorptive properties for different impulsive sounds. There is a pronounced difference to the ear in the qualities of the sounds produced by the upstroke and the downstroke of a telegraph sounder. The click of one make of typewriter is easily distinguished from that of other machines, due to differences in the size and shape of the type bars, as well as to the different mechanisms of the stroke. It would therefore be unwise to draw general conclusions as to the absorptive properties of a material for all other noises from experiments conducted with a single noise. For scientific completeness, the investigation just described, using the release stroke of the telegraph sounder, should be repeated with other sources. Since, however, the object of the present study is

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to determine the *relative* merits of different forms of office quieting treatment, the purpose will be served if we can express the absorbing powers of different materials for various office sounds in terms of some standard material. Here again, one has to thank Professor Sabine for pointing the way in his early experiments, in which he expressed the absorbing powers of rooms and materials in terms of a chosen unit, which in that instance was the absorption of a highly absorbent seat cushion. It will first be necessary, however, to deal with a fact that was brought out by the present investigation, and which is of considerable importance in the general matter of reducing excessive reverberations by the use of highly absorbent materials.

### Effect of Area Upon Absorbing Efficiency

Experiments, carefully conducted, have shown that the apparent absorbing power per unit area of a highly absorbent material depends in a marked degree upon the area of the sample tested. It depends also, although to a less degree upon the shape.

Let $a'$, $a''$, $a'''$, be the total absorbing power of the room and its contents when areas $s'$, $s''$, $s'''$, respectively of absorbent material are introduced. For impulsive sounds, equation $(6)$ may be written

$$at_1 = a' t'_1 = a'' t''_1 = a''' t'''_1 = k \qquad (7)$$

Assume that the absorbing power per square meter of the material is constant and independent of the area, and that it is equal to $a_f$. Then the absorbing power of any area, $s$, will be $a_f \times s$, and equation (7) may be written in the general form

$$(a + a_f\, s)\ t = k \quad \text{or}$$

$$a + a_f\, s \quad = k\ (1/t) \qquad (8)$$

If now samples of different areas be brought into the room, and the times of reverberation be experimentally determined, and if the reciprocals of these times be plotted against the corresponding areas, the points so determined should lie upon a straight line, according to equation $(8)$. As a matter of fact, it was found that this was not the case for impulsive sounds. Since the validity of equation $(8)$ has been established in the case of the upstroke of the telegraph sounder, one is forced to the conclusion that the absorbing power per unit area varies with the area of the absorbing material. This conclusion was made the subject of some two months' careful investigation, using both sustained tones and impulsive sounds.*

The net result of this work may be summarized in the statement that the apparent absorbing power per unit area of highly absorbing materials decreases in a perfectly definite manner as the area increases up to about ten square meters.

Fig. $(6)$ shows the relative absorbing efficiency, for the upstroke of the telegraph sounder, of different areas, of uncovered hair felt, 1 inch thick, the absorbing power of 1 square meter being taken as unity. A similar curve for high pitched sustained tones approximates this very closely. If the actual area introduced into the room be multiplied by the ordinate of the curve, Fig. $(6)$ corresponding to this area, the product as obtained is proportional to the true absorbing power. We shall call this the Effective Absorbing Area. Returning to equation $(8)$, we now plot the reciprocals of the time of reverberation against not the actual area but the Effective Absorbing Area as just defined. Fig. $(7)$ gives the result for five different impulsive sounds. Lines 1 and 2 are for the upstroke and the downstroke respectively of the telegraph sounder. Lines 3, 4 and 5 are for three different makes of typewriters in common use. The closeness of the experimental points to the straight line in every case, is a quite satisfactory verification of equation $(8)$, and justifies the assumption that the change of absorbing efficiency with changing area is the same for all five sounds.

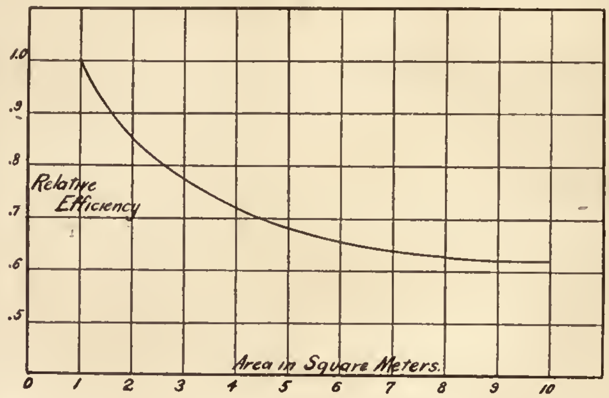


**Fig. 6. Absorptive power per square meter for impulsive sounds of different areas of uncovered one inch hair felt; the absorption of one square meter being taken as Unity**

From the straight lines of Fig. $(7)$, the absorbing power of the room in terms of the unit square meter of felt may be derived. The slope of the line in each case is the increase in $1/t$ per unit of added absorbing material. If the value of $1/t$ obtained with the empty room be divided by this slope, the quotient is the number of unit squares of felt that have an absorbing power equal to the floor, walls, ceiling, and permanent furnishings of the Sound Chamber. The values for the three typewriters include also the absorbing power of

**A report on the results of the experiments with sustained tones was given in a paper read before the American Physical Society in Toronto in December, 1921. An abstract of this paper will appear in a forthcoming issue of the Physical Review.*

the operator. In the following table, the value of the slopes of the lines is given in the column

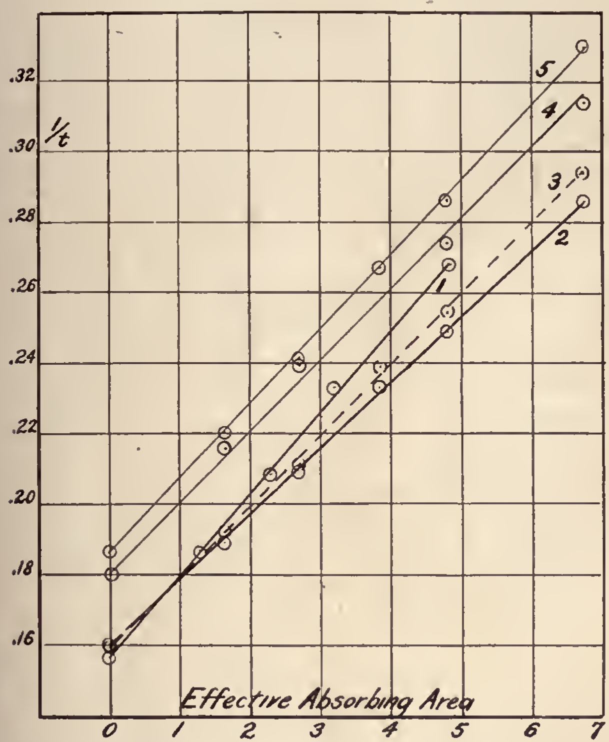


Fig. 7. Graphs showing that the change in the reciprocal of the time of reverberation is proportional to the change of the total absorbing power of the room for five different impulsive sounds

headed $\frac{\Delta(\frac{1}{t})}{\Delta s}$ and the absorbing power of the room in terms of units squares of felt is given in the column $a/a_f$.

TABLE 1

| *No.* | *Source* | $\frac{\Delta(\frac{1}{t})}{\Delta s}$ | $a/a_f$ |
|---|---|---|---|
| 1. | Upstroke of Telegraph Sounder | .0232 | 6.75 |
| 2. | Downstroke of Telegraph Sounder | .0186 | 8.58 |
| 3. | Typewriter A | .0200 | 7.96 |
| 4. | Typewriter B | .0202 | 8.92 |
| 5. | Typewriter C | .0214 | 8.68 |

Having the absorbing power of the Sound Chamber for these various impulsive sounds in terms of the absorbing power of a single square meter of uncovered felt, the absorbing powers of the various surfaces in which we are interested may be determined in terms of the same unit, and values which will give the relative merits of such wall-surfacings in reducing office noises may thus be obtained.

## PART II.

### Relative Efficiencies of Different Materials

Before applying the results of the investigation of Part 1 to the determination of the relative sound absorbing efficiencies of different materials, it will be well to summarize briefly what has gone before.

The theory of Reverberation for sustained tones has been modified to cover the case of the non-musical noises caused by the impact between two metallic bodies. The theory has been experimentally verified in the case of the release stroke of a telegraph sounder, and it has been shown that the time of reverberation of the sound of such an impact varies linearly as the logarithm of the mechanical energy of the impact. The absolute rate of dissipation of such a sound in a room and, from this, the total absorbing power of the room have been determined. By introducing varying amounts of absorbing material, thus changing the total absorbing power, and measuring the absolute rate of dissipation of sound, it has been shown that the product of the total absorbing power and the time of reverberation of an impact sound of given initial intensity is constant. The investigation has also developed the important fact that the absorbing efficiency of highly absorbing materials both for sustained tones and for impact sounds is greater when the material is employed in small units of area. Finally, the absorbing power of the room in terms of the absorptive power of a square meter of a standard material (one inch hair felt) has been determined for the sounds from five different sources, from which, the absorptive efficiency of any surface introduced into the room may be experimentally determined in terms of this same unit.

Absorption of sound energy occurs at reflection from surfaces that are inelastically compressible or flexible, and from rigid surfaces that are porous. The most commonly employed method of reducing office noises consists in lining walls and ceilings with felt an inch or more in thickness. This is covered with a light fabric, held a short distance from the felt. The inelastic flexure of the fabric covering, together with the inelastic compression and the porosity of the felt beneath, constitute the mechanism by which the vibrational energy of the sound wave is dissipated. In recent years, a sound absorbent tile has been developed. This is a structural material, light and extremely porous, and its absorptive merits are due to this latter property. Very recently a plaster has been developed, which is sound absorbent to a degree far in excess of that of ordinary plaster. Accordingly tests were made to determine the relative efficiencies of these materials in absorbing the sound produced in the five different ways mentioned in Table 1.

The typewriters used were chosen because the quality of the noises produced were markedly different, as judged by the ear. They were not new machines, and the results may be taken as typical of the conditions that would ordinarily obtain in practice. Although the method is susceptible of application in determining the merits and demerits of various office machines as noise producers, yet this was not the purpose of the present investigation. The force of the telegraph sounder blows was somewhat greater than would ordinarily be the case, but the values of the absorption co-efficients were found to be independent of the energy of the stroke.

*NOTE—This is the second of a series of three articles, the first of which appeared in the issue of May 24.*

*(To be continued)*

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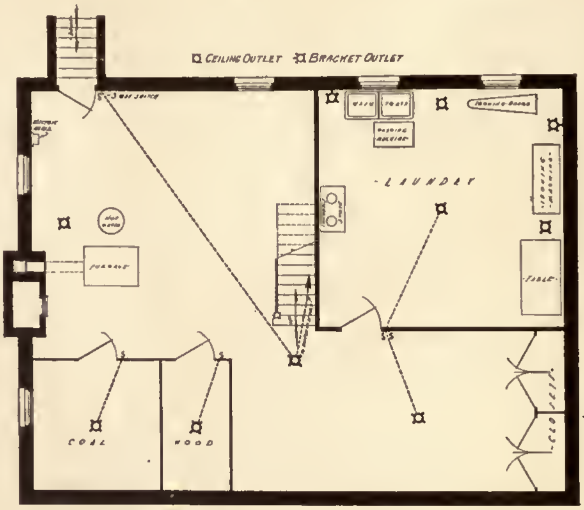
# ELECTRICITY IN THE HOUSE

## VI — THE CELLAR

BY M. O. WHITTON

OF the many thousand readers of Sinclair Lewis' now famous "Main Street," few have not paused to chuckle over the description of Carol poring over artistic designs for their new house, while her husband declares that she can have any old kind of architecture that she wants, providing she lets him pick out the furnace.




The wiring of this cellar is representative of many modern cellars

Although we do not all live in Minnesota, and without reference to Mr. Volstead, any seasoned and experienced houseowner will appreciate the comfort of having a well planned cellar; it may be out of sight, but all the beauty of rich rugs, soft colors and fine old furniture to the contrary notwithstanding, the cellar is not out of mind.

And if there is an infinite degree of comfort to be obtained in having a well planned and well equipped cellar, one great element in that comfort lies in having it well lighted and wired.

In advocating adequate wiring for the cellar the writer is not leading the unwary into ways of extravagance, for there is no place in the entire house in which the wiring can be done so inexpensively. Since the cellar is for use and not for looks, the plainest of utility wiring may be employed which can be strung around the cellar walls and ceiling almost at convenience, and at much less cost than that of wiring above stairs. If further excuse were needed for presenting a plan of adequate cellar lighting, justification would be found in the fact that the cellar is the home of two very necessary adjuncts to comfortable living,—the furnace and the laundry.

Jokes are some of the saddest records of human history; nor would there be such an endless procession of jokes on the subject of furnace tending, were that occupation not one of those banes of human existence,—the price that we pay for being thin skinned animals, or for not living in California. Unfortunately, the writer knows of no electric device for stoking that boiler, for shaking the fire, nor yet for removing the ashes therefrom. The best that we can do at this stage of the game is to provide electric thermostatic control and sufficient light so that the furnace tender may see what he is about.

Let us turn then to our plan, which represents the cellar of an average suburban house of the better type, some thirty feet by forty, and which is to serve not only as a heating source for the house, but also as a location for the laundry, and if need be, as a drying room. Entrance into the cellar is to be had both from stairs in the center of the house, and from a small rear outside entry.

Just to the right of the entry are placed the electric supply company's boards and meters (or single meter as the case may be). This location is in no sense absolute, for the exact placement of a meter will depend on circumstances outside of the cellar itself; however, a cellar location of some sort is usually preferred now, to enable the company representatives to read the meter at intervals without having access to the rest of the house. In this cellar, the meter is shown right near the entry, a position easily reached, a condition mutually advantageous to the meter reader and to the householder. Formerly, especially in suburban locations, it was the custom to place electric meters in the attic, a very inexpensive location where overhead electric transmission prevails, but one rather disadvantageous for all other considerations.

Turning next to the problem of cellar lighting as such. The first requirement is to have light so placed, and so made available, that the person approaching the furnace either from inside the house or from without, will not be in danger of cracking his head or breaking his neck. To avoid accident, and to promote safety, a light is placed near the bottom of the cellar stairs, which, however, is controlled by a three-way switch, so that the current may be turned on either by the person descending the interior stairs, or entering from the exterior cellar-way. An additional lamp is given to the right of the furnace, locally controlled, and placed at such an angle as to illuminate the stoking operations, and yet set at such a distance as to avoid a blow from the end of the long-handled shovel usually prescribed for furnace tending. Behind the furnace and between it and the hot water tank is another bulb, locally controlled, and designed to give adequate illumination whenever it becomes necessary to examine dampers or to inspect water connections.

Coal and wood storage next receives attention; the bins for this purpose are located at the front of the cellar, generally the darkest portion, since it is seldom desirable to break into the design of the house front merely to locate cellar windows. The two bins are each lighted with a single bulb, usually placed against the ceiling and protected from injury by a wire guard. These lights are controlled from switches placed near the bin doors.

Equally deserving of attention is that part of the cellar which contains the laundry and which is located, in our illustration, to the left of the interior stair. This position is fairly well lighted from two cellar windows located along the rear wall of the house, but in the nature of the case, these will not be very large nor are they likely to be spotlessly kept. Accordingly the laundry should be given adequate artificial light to overcome these usual deficiencies. For this purpose, one lamp of fairly large wattage either placed against the ceiling, if it be low, or equipped with a good reflector, will be found both advantageous and economical. This light is shown switched from the laundry door. On the side wall of the laundry, one bracket lamp is also allowed placed so as to give additional light for both the ironing machine and the ironing board; this is suggested because a cellar ceiling is seldom high enough to avoid shadows if a central fixture above is provided.

The equipment of the laundry shown here is complete but not extravagant. Near one window stand the tubs, in front of which is indicated a washing machine, operated from a ceiling receptacle. Near this, and against the partition, is placed a small gas stove for the occasional boiling of laundry. Close to the second window is the ironing board, designed to be used with an electric flat iron, which can be operated from the same receptacle as that employed for the washing machine. If a hired laundress is employed, it will often pay, to prevent negligence in turning off the current, to have a switch placed right on the ironing board itself, as shown in the illustrations on wired furniture in the March 1 issue of this magazine. The "handy switches" to be installed on the flat iron cords are very satisfactory for careful people, but in the hands of the hired laundress are apt to be allowed to come in contact with the hot iron, to the destruction of the switch, and to the possible damage of the wiring.

The electric ironing machine, located next to the ironing board, is power driven from a ceiling receptacle to the right of the machine. These extremely useful machines, it must be remembered, are usually gas heated, except in those parts of the country that give especially low rates for electric heating. But as it is very inexpensive to run armored electric cable about a cellar, and bring it out where needed, it is also no very grave matter to run gas piping to the point of use for either a washing or an ironing machine,—for it is to be remembered that some washing machines have also auxiliary gas heaters.

The remaining cellar space shown is dedicated to a preserve and store closet, and to furnish a drying place for clothes in bad weather. No especial electric equipment is indicated for this for ordinary family use, except one light so placed that it will give sufficient light to anyone visiting the jam closet; this is noted as switched from the laundry partition, a provision made for convenience in getting a light amidst occasional confusion of clothes lines and wet garments.

It may seem to the reader that too generous provision has been made in this plan of cellar wiring. But again, let it be suggested that if economy is the motive, it would be better to save by omitting electric fixtures altogether in the cellar, and substituting bulbs hung from utility cords, as is done in most garages. This method of illumination may not be very handsome, but it will serve the purpose in a cellar, and will not interfere with the safety or convenience of people working there. Furthermore, in point of operation, these more numerous outlets, equipped for the most part with fairly small lamps, will be found more economical than a few large lights. This is because it is almost inevitable that cellar lights are left on when they ought to be turned off. The furnace men, the ash men, the meter readers, the grocery boys, the coal and wood men, the laundresses, who operate in our cellars are not going to be very careful about turning off our lights. For this reason, such a wiring scheme as indicated here, although it may look very liberal on paper, will frequently be found more economical in daily use than a wiring plan calling for a smaller number of outlets.

# BUILDING CODE UNIFORMITY

## A discussion of some of the reasons for existing differences in building codes illustrated by recent attempts to codify reinforced concrete design

SOME of the inconsistencies of American building codes relate to floor loads*; some to thickness of curtain walls carried on lintel beams in framed buildings of steel as well as of reinforced concrete; some to the inclusion of ideas and opinions of local material men and some, but not many, to honest differences of opinion of scientific and technical men. The differences however do not affect all of the population, for but few cities having a population under 5,000 have building codes: of the 1478 cities† with a population over 5,000 not more than 27 per cent are provided with any sort of regulations governing the construction of buildings. Some of these regulations do not govern design, some relate merely to the erection of buildings within arbitrarily defined "fire limits," and a lamentable number of municipalities have no proper methods to enforce such building laws as they have on the statute books.

The proposed uniform code now in the hands of a committee appointed by the Secretary of Commerce, should become a statute in each state when the work of the committee will be completed. In this way the regulation of building will not be longer a hap-hazard matter in less than three per cent of the incorporated communities in the United States. Of the 15,400 incorporated villages, towns and cities in this country only 2,800 have populations in excess of 2,500 but in them the total number of inhabitants amounts to 54,000,000. There are 12,900 rural communities with a total population of 9,000,000. Uniformity in building methods brought about by state laws will result in lessened costs, reduction in waste through ignorance and will tend toward greatly reduced fire losses.

* *The American Architect, Jan.* 18, 1922.
† *The American Architect, Oct.* 12, 1921.

The recent failure of the American Theater in Brooklyn, N. Y., and the Knickerbocker Theater in Washington, D. C., showed that neglect of duty on the part of building department officials nullifies the best drawn codes. The failures proved also that inspectors should be as well educated as are plan examiners. In fact plan examiners and inspectors should pass equally severe examinations and their duties should be interchangeable. In the cases above referred to it was shown that the plan examiners did their duty in checking submitted designs and requiring designers to follow safe practice; the inspectors acted independently of the plan examiners with disastrous results. The best laws are of no effect unless they are enforced by competent and honest men.

The design of structural steel is fairly well standardized. Differences creep in when ignorant men copy provisions from ordinances in nearby cities without properly adapting them to their local conditions. The differences seldom apply to fiber stresses and methods of design, but to floor loads, thickness of walls, etc. The use of wood in structural design is well standardized. Difficulties creep in because wood is a natural product and many local dealers are careless about following grading rules. Compilers of building codes have met the difficulty by specifying stresses which do not please the lumber manufacturers. A satisfactory solution is the branding of one structural grade by representatives of a national organization. A beginning along this line has been made.

Cast iron is an old material far superior today to the cast iron of a generation ago. In localities where much cast iron is made it is better treated in building ordinances than it is in localities in which manufacturers of steel are well intrenched. Freight rates, low strength per pound of material as compared with steel and difficulties in framing place limitations upon the use of cast iron.

Fire underwriters exercise a potent influence and must be recognized in all standardization of building codes. Their work relates merely to the structural portions of a building and possible damage by fire. The underwriters are blamed for thick curtain walls carried on lintels, the effect of the loading being felt in columns and foundations. They are blamed for objecting to some forms of structural tile and hollow concrete blocks, their fear of the effects of unequal contraction and expansion making them very conservative. They cannot be blamed for excessive floor loading requirements, being on record in that respect in a complete building code, the first edition of which appeared in 1905.

Health officials join with fire underwriters, architects and engineers, in preparing building regulations and the sanitary aspect yearly becomes more important. In some places organizations of plumbers are said to have obtained laws which unduly increase the cost of plumbing; in other places, under the leadership of sanitary specialists, the requirements are quite simple and much is being learned about the real value of all that pertains to a proper system of sanitary house drainage.

For years it has been believed that a standardized building code would greatly help the building industry. The American Institute of Architects after wrestling long with the problem decided that public spirited professional men could not devote the necessary time to the preparation of a code to be effective throughout the United States. The recommendation was made that it was work which should be done by the Bureau of Standards. Secretary Hoover appointed a committee of men representative of the organizations having most at stake in the matter and the Bureau of Standards is doing much of the necessary experimental work.

At this time the concrete specialists arrive with recommendations and the question arises as to whether a building code for the United States can be specific on all materials and on all items affecting their assemblage. In 1916 the Joint Committee on Concrete and Reinforced Concrete issued a final report. It was stated by the committee that the report was not a specification but formed a basis for a specification. A new committee was appointed to prepare specifications, that is building code requirements and a progress report was rendered in August, 1921; which report was discussed at a meeting held in New York on December 7 and 8, 1921. It was recently cited in a report made to the last annual meeting of the Concrete Institute, as showing the need of uniformity in building codes.

A committee of five engineers, specialists in reinforced concrete design and construction, estimated the cost of a hypothetical building 80 x 300 ft., six stories in height, no basement, the first floor being on the ground. The roof load was 40 lbs. per sq. ft., live load, and the weight of the roof and cinders was 30 lbs. per sq. ft. The building was calculated for both flat slab and beam and girder construction, using live loads in common use, according to the New York City code and the proposed Joint Committee specifications.

The Concrete Institute Committee on Reinforced Concrete Building Design and Specifications, A. R. Lord, Chairman, extended the work to include other cities. The following distribution of costs of component parts of a concrete building was arrived at, as an average:

| | Flat Slab Building | Beam and Girder Building |
|---|---|---|
| Floors and roof | 65% | 68% |
| Tied columns | 8% | 9% |
| Spiral columns | 12% | 11% |
| Footings | 13% | 10% |
| Walls, etc. of concrete | 2% | 2% |
| Total | 100% | 100% |

The committee stated the costs covered in their report may be taken roughly to represent about 20% of the cost of the completed building, being for steel and concrete only in place.

The result of the analysis of the costs gave somewhat surprising, not to say disconcerting, results. The costs of all materials were identical in each case, the differences in total cost being due to matters of purely engineering detail found in the codes and specifications named. In the original table the cost ratios of the Joint Committee specifications to other specifications are reciprocals of the cost ratios given in the table below. The form here given is believed to be more simple as the intention is not to criticize the Joint Committee specification but to use it as a basis of comparison of costs with specifications in daily use.

Reinforced Concrete Cost Ratios

| *Code or Specification* | Flat Slab Building | Beam & Girder Building |
|---|---|---|
| Joint Committee (Base) | 100 | 100 |
| Am. Conc. Inst. 1920 | 92 | 111 |
| Chicago | 97 | 115 |
| Philadelphia | 98 | 135 |
| Cleveland | 102 | 147 |
| New York | 90 | 100 |
| Detroit | 89 | 102 |
| Cincinnati | 81 | 91 |
| San Francisco | 98 | 110 |

Until a uniform building code is prepared for the whole country the use of the Cincinnati requirements for reinforced concrete design should be popular with competitive designers, for buildings to be erected in the thousands of municipalities not at present provided with building regulations.

Assuming that care was taken to select for membership on the Joint Committee none but those best fitted to prepare specifications for reinforced concrete design puts engineers in a defensive position. The uniformly higher costs for beam and girder buildings, except for Cincinnati, may be taken to indicate that steel salesmen had considerable influence when the codes were drawn. No patents were involved and the adopted specifications helped the sale of reinforcing steel. The design of beam and girder buildings might very well follow the Joint Committee specifications and thereby make a material saving in cost in each of the cities mentioned.

The uniformly lower costs for girderless slabs indicate that owners of patents for this type of construction were much in evidence except in Cleveland, when the codes were drawn. An easy solution of the difficulty would be to throw out Cleveland, the highest in cost, Cincinnati, the lowest in cost and, by averaging the others produce a compromise specification. This would be in harmony with the way building ordinances are usually drawn.

### Structural Steel for Buildings

THE Building Code Committee of the Department of Commerce, Ira H. Woolson, chairman, states that that committee desires to secure individual expressions of opinion concerning proposals that have recently been made to modify building codes throughout the country by permitting higher unit stresses in the design of structural steel units in buildings. The committee will not make public the names of persons offering suggestions. Communications should be addressed to the Building Code Committee, U. S. Department of Commerce, Washington, D. C.

### Plastic Wood

A PLASTIC wood composition is the latest addition to the list of materials valuable in building construction. It is reported to be composed of a nitrated cellulose dissolved in amyl acitate and other solvents and kneaded with finely ground wood meal. It resembles putty or modelling clay and can be readily molded into any desired form. Tenacious in character and capable of adhering to almost any surface except a greasy one, it dries within a few hours to a hardness similar to pear wood and can then be worked like real wood. Because of its plastic condition in the making it can be used in such various ways as pattern making, crack filling, and repairing damaged pieces. It is made in England.

### New Wood Preservative

A RECENT development is a new wood preservative, a mercury derivative, an anhydride of oxymercuric acid. Only 0.01 to 1 per cent of the preservative is required to give good results. It appears that on exposure to air, the wood treated in this way becomes impregnated with very powerful insoluble mercury salts which effectively prevent the decay of the wood. The addition of soda ash and other alkaline salts helps this action along. In admixture with such preservatives as copper sulphate, lead acetate and zinc chloride, the disinfection of the wood is even more complete.—*Industrial Digest.*

## COMMUNICATIONS

### Electricity in the House

The Editors, THE AMERICAN ARCHITECT:

REFERRING to article on The Modern Kitchen in the April 12 issue, pages 324-5-6.

There should be a switch for bracket light over sink. To stand in splashed water and turn a key with wet hands might be hazardous. (Code requires switch).

If modern electrically, it should be modern in all respects; hence, table should be nearer range. Range should have smoke flue, hood and vent flue. (Flues should *not be omitted*). Sink should have *double* drain boards. Dish-washing machine may not be used when there are but few dishes to be washed, or, if it is, a left hand board is mighty handy for removing, sorting and rinsing.

It being an even chance that the ice-box will not be an electric one, it should be located on kitchen porch or just inside the door from porch to save dripping and tracking. Better to put ice-box under high window to porch and ice it from outside.

Of course this is idle, as any woman would rearrange such a kitchen after the first day's use.

N. BLAISDELL.

San Francisco, Calif.
May 4, 1922.

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*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and
The Architectural Review.

## Using the Yard Stick

SINCE the issuance of Bulletin No. 5 several members have submitted analyses of specifications they have made in accordance with the principles set forth. The judgment that the "Analysis of a Specification" would indicate a most valuable means of weighing the basic phases of a specification thus seems to have been confirmed in a gratifying manner. The significance of this "Analysis of a Specification" must be recognized before the fundamental requirements of a specification can be determined and it is only by a study predicated on this method that the writing of specifications can be improved in a scientific (and consequently correct) manner.

One of the members has submitted the following study and suggests that "the foundation of all good specification writing is the proper arrangement of the contents of the divisions which go to make up the body of the specifications."

Definition — Statement, if any

Substitutes — The specialties particularly named in this specification shall be considered as standards. Bids on proposed substitutes of like characteristics and value are invited but substitution will be authorized only on the ground of unquestioned betterment, price concession or availability. Bidders on this work must base their bids on the specialties named. Substitutes must be offered as an addenda to the original bid.

Contract Documents — Read and comply with the General Conditions prefixed to this specification (See Pages 1 to 9 inclusive).

Legal — Reference as to permits, regulations, codes, royalties and patents, standards, etc.

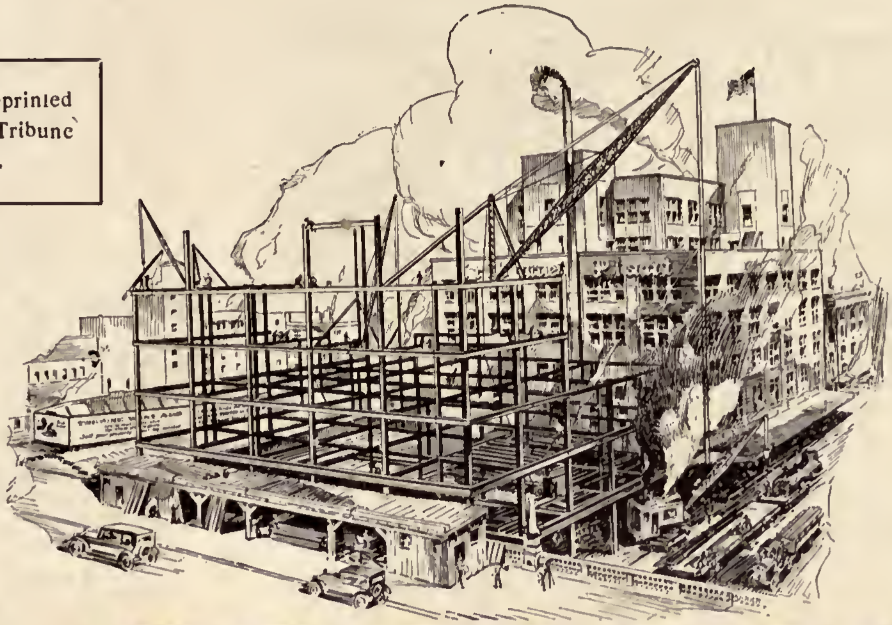
Work Omitted — Mention any work usually done or material usually furnished which is not to be included under this division of the general specification, such as work, material, or apparatus provided by the Owner or by others; or material or apparatus provided by the Owner or by others but set or placed by this Contractor.

Not Included — (Very important).

Owner Provides — (To avoid "extras").

Now Under Contract — (To prevent conflict of authority).

This page is reprinted from The Chicago Tribune of June 10, 1922.



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THE AMERICAN ARCHITECT
THE ARCHITECTURAL REVIEW

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VOL. CXXI JUNE 21, 1922 NUMBER 2396



## *Plates*



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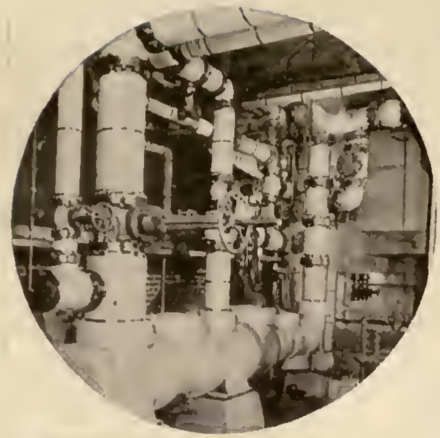

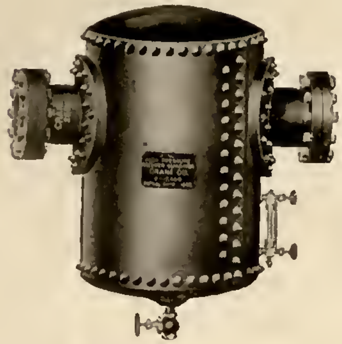

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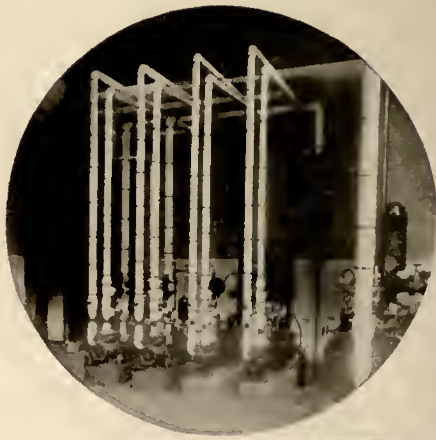
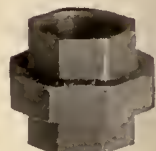
STEAM SEPARATOR









CRANE FACTORY WASH SINKS

BRASS GLOBE VALVE

CRANE FACTORY LAVATORIES

497

Frontispiece & No. 2396

CAMPANILE OF GIOTTO, FLORENCE

# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

VOL. CXXI WEDNESDAY, JUNE 21, 1922 NUMBER 2396

# FIFTY-FIFTH ANNUAL CONVENTION, AMERICAN INSTITUTE of ARCHITECTS, CHICAGO, ILLINOIS, JUNE 7, 8 and 9

LAST year, when in May the American Institute of Architects held its convention in Washington, delegates were compelled to walk from the hotel to the convention halls through rain-swept streets. And when they had reached the meeting place and sat, a comparatively small number, in a convention hall large enough to accommodate five times as many delegates, they were not permitted to soothe themselves with smokes. There were many discomforts, but the rain, the dreariness of surroundings or the lack of consolation that might come from nicotine, did not prevent the conduct of a most successful meeting, but laid the foundation for the present finely conducted gathering of the Institute.

Out along the shores of Lake Michigan, on the Hyde Park Boulevard, were the headquarters and convention hall of the fifty-fifth annual convention. The Chicago Beach Hotel is an unusually large,—or long,—hotel in a city noted for its vast hotel buildings. The succession of days that marked the convention were the "rarest" of rare June days. The convention hall, spacious enough to hold the delegates and those who also interestedly followed the three days of meetings, was filled with the reflected light from the waters of Lake Michigan. A cheerful place, where the program for each day was pleasantly carried forward. The ban on smoking was not on at this convention, and the ventilation was so good that delegates and visitors could all contentedly and enjoyably follow the various discussions.

The Illinois Chapter, the hosts on this occasion, with characteristic Western hospitality had thoughtfully seen to the comfort of the visiting delegates. All in all, this convention is one that from the very outset spelled success. The enormous length of the hotel corridors, long enough to have accommodated without undue crowding a whole brigade of infantry, seemed to the pessimistic ones who looked about them on the evening preceding the convention, to presage a small attendance. But when on the morning of June 7, President Kendall called the convention to order, what appeared to be but a small attendance was found, when gathered in the convention hall, to be a full and highly representative gathering. President Kendall's address will be found, in full, on another page of this issue.

To those who for a decade or more have attended conventions of the Institute, there were to be noted certain indications that bespoke the success of this meeting. The days when conventions were regarded as junkets for delegates have passed. Social functions that absorbed so much of the time and a large part of the interest of many delegates are conspicuous by their absence. Not that there was any lack of social relaxation but the relaxations were those that might logically be part of a gathering of architects and not merely opportunities for the display of sartorial elegance. In fact, the American Institute of Architects with its largely increased membership, its sound financial condition and the earnest and thoughtful attitude of its officers and the members of its committees, is assuredly entering upon a course that will make it more truly representative of the profession than it has been for many years.

When during the course of President Kendall's address, he announced the name of the donor of the $25,000 Educational Fund, a burst of applause interrupted him. The suggestion that this fund be named in honor of its donor, the Waid Educational Fund, was greeted with the liveliest satisfaction. Mr. Waid, in acknowledging these expressions of enthusiastic approval, said,—"I hope that this may be the beginning of what the Institute may hope to do in the future. So far as I am concerned, it is simply the expression of a hope that it will afford an opportunity to students of architecture that was denied to many of us."

Following the President's address there was presented the report of the Board of Directors. This voluminous document was referred to the usual committee. In substance, it is practically a resume of the various committees, amplifying, criticizing and recommending. At these conventions there arises in the mind of the thoughtful observer ever an attitude of respect for the work of the men who represent the Institute either on its Board of Directors or on its many faithful and hard working committees. These matters so carefully thought out and so decidedly set forth should not be allowed to sleep, but it would seem as if there should be installed some more strongly working machinery that would operate between the conventions.

Mr. Kimball, of Omaha, as president of the directors of the Institute press, presented the report of the *Journal of the American Institute of Architects*. During the course of his remarks he stated,—"Our money comes largely from advertising, our return to these advertisers lies in our increasing subscriptions."

AT this point of the morning's session of the first day, a pleasant feature was reached. It was the presentation of charters by President Kendall to the newly formed chapters. These new chapters are Central Illinois, Erie, (Pa.), St. Paul, (Minn.), Atlanta, (Ga.) and Southern Pennsylvania.

The report presented by Mr. Wm. B. Ittner, of St. Louis, as Chairman of a Special Committee on Survey of Institute Methods, was received with the closest attention and provoked an expression of sentiment that resulted in considerable discussion.

Referring to the matter of Institute membership, and in reply to a suggested question, "Where should the Institute be financially five years from now?" a plan was presented by Mr. Ittner, wherein Institute membership may reasonably be supposed to increase by a certain arithmetical progression until in 1927 the enrollment will have attained a total of 4,000 members. To simplify this progression towards a membership of 4,000 it is proposed in this report to provide a Junior class to which graduates of "recognized schools of architecture" would be eligible. The proposition so to amend the Constitution as to provide for this Junior membership was debated along the following lines.

"Any graduate in architecture of a school recognized by the Institute is eligible as a Junior upon submission of proof of his graduation, the Junior affiliation to expire automatically when the Junior has reached the age of 30 years. Privileges of Junior membership to be: 'To receive the *Journal* of the Institute as part of their annual dues; to receive copies of convention proceedings and such other Institute documents as the Board of Directors may direct; to be permitted to use after their names "Junior A. I. A" '." It was further provided that the annual dues of Juniors were to be $5, of which $2.50 should be for one year's subscription to the *Journal*.

A greater part of the discussion on this report centered on the meaning as to "schools approved by the Institute."

The report and resolution were finally approved, and referred to a committee to work out their details.

PROMPTLY on the adjournment of the morning session on Wednesday, the delegates and visitors to the convention, gathered in a large adjoining dining room for an informal luncheon. Five-minute addresses were made on subjects of interest to the profession.

The principal address at this luncheon was made by George W. Maher, F. A. I. A., Chairman of the Municipal Art, Zoning and Town Planning Committee of the Illinois Chapter of the American Institute of Architects. Mr. Maher reviewed interestingly the results achieved, and the need for disinterested service, particularly as the work is of an extremely technical character, of a group of trained men actively interested in the orderly growth and beautification of their communities or cities. Said Mr. Maher:

"The architect occupies a strategic position in such matters; his training and knowledge of planning, design and building construction establish a prerogative that is of value. The public is becoming acquainted with this fact and with the aspirations and ideals for which he and his organizations stand. Indeed, it is very evident that the time is not far distant when many vital problems affecting our cities' development will be submitted to the architectural profession for advice and approval before final decisions are made involving the spending of vast sums of public money."

Mr. Maher's description of the movement set afoot by the Illinois Chapter to save and perpetuate the Fine Arts Building of the World's Columbian Exposition was listened to with close attention.

"This magnificent structure is the last remaining memorial of a great art achievement. An achievement that undoubtedly stimulated America to a broader interest in art, architecture and city planning and beautification. It therefore possesses a distinct significance that is of value not only to Chicago but to the entire nation.

"The great international Exposition of 1893 also marked in a notable way America's first worldwide association with peoples and nations from abroad. Since then other great events of international significance have occurred, but it may properly be claimed that the first international attempt was successfully achieved at this great World's Columbian Exposition.

"The building was designed by Charles B. Atwood, an architect of eminence who was associated with Daniel H. Burnham, the directing architect in general of the World's Columbian Exposition. The main central pavilion was suggested by Bénard's 'Grand Prix de Rome' drawing, but Mr. Atwood refined and changed the detail. He designed the balance of the structure in accordance with this central motif and produced a result that will live as long as art has any direct appeal to mankind.

"The building has been used since the World's Fair period to house a great collection of natural history and was temporarily known as the Field Museum. This great collection has been recently moved to its spacious new home in Grant Park.

"The exterior of the Fine Arts Building is in a state of disintegration due to the condition of the plaster veneer surfaces, which were not originally intended to be permanent. This has led to the general belief on the part of the public that the building was no longer safe and that due to its seemingly dilapidated condition it would soon be wrecked.

"The Illinois Chapter through its Municipal Art, Zoning and Town Planning Committee and the Illinois Society of Architects jointly compiled a comprehensive report and detailed estimates setting forth the amount of money necessary completely to rehabilitate the structure and make it ready for use. This estimate amounts to $1,640,000, and includes refinishing the exterior with waterproof cement, installing a heating plant and plumbing fixtures, reconstructing the roof skylights and in general rehabilitating the entire structure. It is unnecessary to state the many features involved in this undertaking, such as the priceless value of the site or grounds and the actual worth of the building as it stands today in Jackson Park; all of these items are completely covered in full. The report was formally submitted to the South Park Commissioners and also given wide publicity.

"The Fine Arts building would be especially appropriate for such a great school of industrial design. Its purity of style expressing a universality of art and architecture would be an inspiration to the student stimulating him to greater efforts and thereby encourage a creative art worthy of American genius.

"True progress must be founded on a knowledge of the great past and of those principles underlying all enduring art. It is, therefore, fitting that such a noteworthy building that embodies these necessary requisites, also historic significance and opportunity for service, should be of particular interest to the American Institute of Architects.

"It is their responsibility, their opportunity to lead the thought of America in matters of this nature.

"It is with pleasure, therefore, that I am able to state for the Illinois Chapter that the movement toward restoration of this famous building is well under way."

During the course of Mr. Maher's informal talk he was interrupted by many manifestations of approval.

The restoration of a building so architecturally good and one that emphasizes so well the renaissance of architecture in this country, it was believed, might very well claim the support of the Institute, and every member of the profession in this country.

The afternoon session of the first day was devoted largely to routine business. An early adjournment was had to permit of a visit of inspection by delegates of the buildings on the grounds of the Chicago University and, *en route*, an inspection of the Fine Arts Building, the features of whose restoration had been explained by Mr. Maher during luncheon.

The evening session was a special meeting devoted to general discussion of industrial relations. The outstanding feature was the address by Mr. T. E. Donnelley, Chairman of the Executive Committee of the Citizens Committee to enforce the Landis Award.

## SECOND DAY

ONE of the most enjoyable features of the convention of the Institute occurred on the morning of the second day's proceedings. It was the presentation of the Institute Gold Medal to C. Howard Walker. President Kendall in his short speech of presentation, stated, in part:

"Dr. Walker, as one of the very few members of our fraternity who have received the honors you have received, I wish to present on behalf of the committee and Institute to you, Dr. Walker, doctor of art, this token of our appreciation of your literature and skill and of your ability to put into a few words the substantial facts you wish to present, congratulating you also upon the success of the work which you have done in presenting the work to the colleges and universities of the country." (Prolonged applause).

In accepting the medal Dr. Walker held the delegates to the closest attention. He described interestingly his visit to different colleges in the middle West and before that to prep schools in New England.

Continuing, he stated, in part:

"The argument I used which seemed to get the best response was this: I stated I had been talking with a French officer who was speaking of our men abroad. He said that the American soldier trained well, died well and went beyond his objective but he had too many casualties. And I said, in our desire and our hunger to get ideas, especially in regard to art, we were going and had gone beyond our objective, because we did not properly train. I said to one college professor, 'Look down on that street and you will find the casualties on both sides as far as you can see.' (Laughter and applause).

"There was another point and I think this point is an extremely serious one, one that I pressed hard. It was, that there is no more than 10%, hardly that, in the colleges who have a post graduate and a graduate course in art, where the pupils have any knowledge of art or have anything to do with it, and of the other 90%, the men are going out, simply as college men. Suppose they *are* trained as cultured men and they become the head of large financial interests, the rest of them become chairmen of village improvement societies. These men are the men dealing with funds, they are the men whom you deal with in committees; they control, and the constant desire on our part is to satisfy them and at the same time we have to teach them. And they don't like to be taught; they entirely dislike it. They have not been educated in any way in art.

"A question came up in a certain resolution in regard to college examinations. I found throughout the West there weren't any college examinations—a high school certificate was taken in a number of the colleges, and that they 'minored' and 'majored.' It was the first time I came across that. I don't know yet what it means, but it does mean that some of the work on which some of the men were accepted was very 'minor' indeed.

"Now, how to organize? In what way? I think that a little conversation I had in St. George's School, the first one I went to, will perhaps explain the idea. A teacher of grammar came to me and said, 'How on earth will I be able to teach art in teaching grammar in syntax?' 'You have themes?' 'Yes!' 'And they have episodes or something?' 'Yes.' 'Give them a subject which relates to art.'

"Another came to me and said, 'Well, I am teaching English. I recognize in English literature the art, of course, in the history of it, but what else?' 'Have them illustrate whatever romance they write.' 'Illustrate, they can't draw!' I said that there was no man who could not draw; there is no child who cannot draw, and the reason that at seven or eight the child stops drawing is because the parent of some clever child will push him so that the poor little fellow whose parents cannot draw, shrugs his shoulders and says, 'Well, I'll go in for athletics.' If you let that child alone he will keep going, and I believe a person who cannot draw, who cannot record his observations without the means of an alphabet, is a cripple and he ought to be so considered.

"The suggestion I would make of it is this—that in some way with all this enthusiasm, with all this desire, with no entrance examinations in a lot of the colleges, we have plenty of work. You take a college that is dependable on 200 Holstein cattle and a $40,000 bull for part of its income and you are not going to get an advance examination of a high grade from that college. It is struggling and it is doing its best and it is doing mighty well, but get into the questions that are given the pupils and you will find you have to educate the teachers."

THE report of the Committee on Credentials presented on the opening of the second day, showed that there was a total attendance of 220, delegates, alternates and members.

The discussion on the development of the Octagon property in Washington consumed a large part of this morning's session. The necessity for some properly conceived plan was, in the opinion of those who took part in the debate, of first importance. The plan eventually to be carried out will undoubtedly be along the lines as set forth in the report of the Building Committee, printed on another page.

### Afternoon Program, Second Day

The hospitality of the Illinois Chapter was most splendidly shown in the entertainment provided delegates on the afternoon of the second day of the convention.

A motor tour of the North Shore of Chicago that led through Lake Forest and back to Winnetka, where dinner was served at the Indian Hill Golf Club, was an experience that more than one hundred men and women will long remember. Through the courtesy of the owners, three of the fine estates along the North Shore were visited. Two of these houses were designed by Howard Shaw, the third by Charles A. Platt. The visitors were afforded the freest opportunity to inspect these stately houses, inside and out, and to wander through the formal gardens and on the broad terraces that overlooked Lake Michigan.

The dinner at the Golf Club, where the architects were welcomed by the Committee of the Illinois Chapter, marked the end of a perfect day. Western hospitality, always quoted for its fineness, was never more splendidly shown and, we believe, more thoroughly appreciated.

While Thursday, like all of the days of the convention, was unusually warm, it was perfectly bright and fair. The ride along the shores of Lake Michigan was through a splendidly developed suburban country, and the discomforts of a warm summer's day were tempered by a cooling and refreshing breeze. Particularly enjoyable was the ride home after dark, when the full moon silvered the landscape. This afternoon and evening were a fine convention experience. The Illinois Chapter seem to be able to control even the elements and the moods of nature when they set out to act as hosts.

### Friday's Session (Last Day)

THE principal feature of this session was the report of the special conference on Better Advertising to Architects, coupled with the report of the Committee on Structural Service to Architects. The report on Better Advertising was accepted with little, if any, debate. The details of the Institute's action on a matter that by some seemed to be wide of its legitimate field, will be found on another page.

There was also a lengthy report by the Committee on Small Houses. In connection with this new activity on the part of the Institute, it may be stated that the general belief seemed to be that there had not as yet been sufficient completed building operations carried forward to regard the matter as of in anything more than an experimental state.

The Luncheon held on Friday, as on Wednesday, in an adjoining dining room, was equally interesting.

Mr. George C. Nimmons, of Chicago, spoke on the Essentials for the Practice of Architecture. Mr. Nimmons strongly urged that architects become thoroughly familiar with the financial problems of their profession and thus take them from the hands of speculators who were not believed to work for the best interests of clients.

Mr. Thomas E. Tallmadge addressed the gathering on The Fine Arts as a Cultural Study. He was listened to with close interest.

When the convention re-convened at 2 o'clock for its last session, the report to the tellers, setting forth the results of the election, was called for.

The result announced was as follows:

For President, Wm. B. Faville, of San Francisco.

For First Vice-President, E. J. Russell, of St. Louis.

For Second Vice-President, Robert D. Kohn, of New York.

For Secretary, Wm. Stanley Parker, of Boston.

For Treasurer, D. Everett Waid, of New York.

Directors:

William Emerson, of Boston.

Benjamin W. Morris, of New York.

Wm. L. Steele, of Sioux City.

After the usual speeches and rising vote of thanks to the officers the convention adjourned.

Detail of Interior, Church of San Andrea, Mantua

From the original Photograph by Robert M. Blackall

# THE PRESIDENT'S ADDRESS

## Fifty-Fifth Annual Convention of the American Institute of Architects

IN again coming before you to present an account of our stewardship of your affairs during a year's activities, I am anxious to impress upon you the fact that the Officers of the Institute are responsible to you, its Chapters and Members, for what they do and to impress upon you again that what is done is carried out in the belief and intent of obeying your instructions.

May I briefly review the system under which the Institute is organized and its affairs managed? In 1913, at the convention in New Orleans, the Institute adopted a number of amendments, tending to establish a more democratic form of government.

The Convention, made up of duly appointed delegates from the Chapters, is the supreme authority.

Its decisions, on matters of general policy and professional principle, are final and are binding upon all its chapters.

As the Convention cannot sit continuously, its decrees are committed, between sessions, to the President and the Board of Directors and these in turn are assisted by the Executive Committee and by standing and special committees.

In this way many men are working at all times upon the problems of the profession.

These committees are reinforced and supplemented by the executives and committees of the several chapters, who are practically supreme in their several districts.

In order to secure a reasonable territorial representation we have, by a gentleman's agreement, provided that our directors shall be so elected that there shall be a representative of each region at all times upon the Board. There being nine directors, there are nine regions or districts, somewhat irregular in area and population, but intended to secure a proportional representation.

The Institute has fifty-one chapters distributed all over the country. These chapters represent widely varying conditions and customs. The problem of a central administration would be almost unsolvable were it required to legislate upon all questions arising in all these differing conditions and localities. Wisely, therefore, the local administration is confined to the chapter and the Executive seeks only a general supervision and guidance. Even this at times seems to some among us to be too paternal and restrictive.

This organization machinery on the one hand and the large field of chapter independence on the other hand, bound closely together by mutual interests, and by representative committee personnels, have made the Institute a powerful influence in national and local affairs. Our standards, our ideals, and our rulings are increasingly recognized and our judgment is deferred to.

With our increased membership we should greatly increase our influence. We are relatively a small group compared to our population, but with a real appreciation of our opportunities and of the real value of our service we may claim and expect to be accorded an influence most potent for good in all public affairs.

Every architect has reason to be proud of the Institute and ought to wear with as great a pride as that of any fraternal order the badge of membership. Whatever may be our shortcomings we have enough of achievement to justify our pride.

Believing that a great many of our members concern themselves so little with Institute affairs that the announcement of our activities and decisions comes with a shock to their nervous systems, if it comes at all, I am tempted to rehearse some of the things which have been done during the thirteen months since we last met in convention, in the hope that in this form they may have greater publicity than the more formal reports which will be placed before you by your officers and committees.

This matter of publicity, by which I mean advising at frequent intervals the entire membership of current happenings in which the Institute or its affairs have a part, has not hitherto received the attention it deserves and I am glad to state that an effort will soon be made to publish for your information a monthly summary of the happenings in the *Journal,* and to say that you will find in it an answer to a question sometimes asked as to "What is the Institute doing for me?"

Our campaign for membership has continued with gratifying additions to our numbers,—1032 new members in two years and we now have in round numbers 2500 members. An increasing desire for getting together is shown by the organization of new chapters, eleven in two years, in new territory in some instances, and in other cases in sections where it has been impossible for members to attend chapter meetings at headquarters on account of distance and expense of travel. These new agencies will, I believe, be new centers of activity for promoting fellowship, for upholding professional standards, and developing a comradeship not otherwise possible. We welcome these new bodies to our fellowship and wish for them all prosperity.

An embarrassment arising out of our increased membership is the increased size of our conventions. If the old standard of representation is to prevail, a convention membership of 300 to 400 will result, making a somewhat unwieldy body, particularly so, if every one is to be permitted to voice his opinion on all topics presented for discussion.

Especially will this increase bear heavily upon the chapter treasuries, which bear a part at least of the expense of sending delegates to the conventions. The Directors have, therefore, with the assent of the chapters, limited the attendance to this present convention and will suggest a revision of the By-laws reducing for the future the number of delegates which shall be appointed, which will automatically reduce these expenses.

There has been an increasing recognition of the Institute by public bodies having to do with the building, artistic, and economic questions of the day. The Department of Commerce has been most generous in recognizing the value of the architect's advice and assistance and has given adequate recognition to members of our profession in forming committees and commissions for the study of economic problems.

Our members serve in these groups at great personal sacrifice, for the honor of the profession, and from the highest motives. We should accord them every recognition and approval.

The association formed two years ago to bring together all classes interested in building, ably directed and fostered by leading men of the profession, and called by them the "Congress of the Building Industry," has gone forward with its work. Local bodies have been formed in our larger cities and frequent conferences are held to study the problems of the industries involved and find a common ground of agreement and promote efficiency in building matters.

Other related services, such as the Small House Corporations, have carried forward their work. New divisions have been organized and are developing plans and service programs. It should not be forgotten that this is not a scheme for profit and is carefully safeguarded from ever being used in that way. It is to give to those who could not otherwise have it, an expert professional service at a cost impossible except by such a combination. It has not appealed to some of our members, who have felt it unwise and will so express themselves to you. This will be a matter for you to decide and I ask of you its thoughtful consideration.

The Board of Jurisdictional Awards has continued its work and "work" very adequately describes its task during the year. Its decisions in the past have not always commended themselves to some of you. Some have felt that they, in their happy situation of *Veni, vidi, vici,* could not give their adherence to these agreements. How glad I am that you are free from the very troubles that the Jurisdictional Board was constituted to avert. How considerate we wish you would be toward those of us who, still under the harrow, are glad of any ruling that will divert the particular prong which menaces us to another direction, or remove it altogether.

In so great a country as ours there are many varying conditions. Not all of us have a Landis, or a united citizen opinion supporting our efforts for fair play and equal opportunity and what is good in one case may not always prove the best in all others.

I beseech your tolerant, sympathetic patience and assistance.

The Institute is continuously asked to join in organizations for altruistic, co-operative, constructive effort and to many of these which promise real service for the country, we have given our moral and material support, asking many of our most active and efficient members to attend and give their service and, with regret I confess it, pay their own expenses. This should not be necessary and I hope the Directors will be able to find some way in the near future to meet these really necessary expenses. It is often hard for representatives of other organizations, which give considerable sums to finance these operations, to understand why we cannot do our part as well as they.

In November last the Institute called a meeting of leading advertisers, representing a large number of firms manufacturing or dealing in building materials and there met in Indianapolis seventy-five or more men active in the presentation of their goods and we discussed the waste in present day methods of advertising and presentation of products to the architect. Striking examples of waste and poorly directed methods were presented and a lively interest in improving the business was aroused. An organization was effected and an intensive study of methods and materials inaugurated. I anticipate worth while results and acknowledge with gratitude the splendid spirit in which our advances were met by the business men who were there.

Structural Service. Every month the *Journal* has a fund of valuable information published under this heading and the printed matter represents but a small part of the Committee's activities. Its members serve on various related boards and committees. It is working on building exits, safety codes for elevators, gas safety, school buildings, floor openings, electrical symbols, testing wood, paint, and other building materials, and is representing the Institute on several of the allied boards and commissions which are studying the problems of the Building Trades.

The *Journal* publishes these reports as a part of its service to the Institute and shares in the expenses of the Committee. It also publishes the minutes of Board and Executive meetings, and all such matters as can be placed before you in an open-to-the-public-column magazine.

The *Journal* has completed its year with a balanced treasury; a most notable accomplishment when we consider the difficulties which all professional papers have encountered during the last twelve months. It will add shortly the page of current events in Institute life referred to elsewhere.

Closely connected, in thought at least, with structural service, is the Contract Committee. When the Committee on Contracts struggled to develop a standard form, better than the Uniform Contract, many said—it is useless, the public will not accept it. Like many another thing which can't be done, they went and did it. One hundred thousand or more copies of Agreement and General Conditions, of the Standard Documents, will be used this year and the demand is constantly increasing. Incidentally, the documents pay a profit into our treasury.

The subject of competitions has been, as always, a troublesome one and much time and anxious thought have been given to it. The most serious consideration was given to charges brought against an advisor and the standing committee, by a chapter, which grew out of a permission to waive "essential conditions" so-called, and resulted in great dissatisfaction and the simultaneous withdrawal of a number of men who were not satisfied with the verdict. The Directors and the Committee on Competitions gave most serious consideration to the limitation of the authority of the committee; but in view of the tendency of legislatures and other bodies to embody in statute or ordinance, conditions which are incompatible with what we call essential conditions, an insistence upon which would prevent public improvements of importance, or result in throwing them into incompetent hands, it seems as if the authority must be continued for the committee still to use its discretion.

The Directors were asked by the last convention to formulate rules for recognizing special ability and service by the conferring of Fellowship upon members of the Institute. At first this seemed an easy matter to adjust and suggestions for nominations were invited, to be acted upon by the Jury of Fellows as now constituted.

When, however, the Jury approached consideration of its task, it soon became convinced that while Fellowship, as a recognition of special service, or fitness, was desirable, the selection of candidates ought to be made by an independent committee, not engrossed with other duties, but free to give careful and deliberate consideration to all claims made and such investigation as might be necessary to establish thoroughly the worth of every nominee. An amendment to the By-laws to establish such a jury will be presented for your approval.

Some years ago a new form of badge indicating membership was adopted, but until the last convention it had never been directed to be made. The Board was directed to prepare it and place it on sale. It is to be had from the Executive Secretary at the Octagon and I hope whenever I meet you in future, even if your name or face be unknown to me, to be able to identify you as one of the fraternity and so to be on friendly terms at once without further formality.

During the year our Committee on Foreign Building Co-operation organized an exhibition of American Architecture at the Paris Salon and it was afterward sent to London at the request of the Royal Institute of British Architects and by special request was retained for some months for exhibition in other cities. The report of the Committee will cite the satisfaction and appreciation with which it was everywhere received.

The finances of the Institute will be appropriately reviewed in the report of our Treasurer. So quiet and unobtrusive a gentleman is he, that you scarcely realize how important a factor he is in our counsels and activities. Let me tell you, however, that we never, if possible, hold a meeting without him and that when he disapproves we hesitate twice ere we override his opinion.

A year ago a generous gift of $25,000 to the Institute was announced, the income to be applied to educational purposes. The gift was, in fact, $27,000 and the bonds in which it is invested have a market value at last reports of $28,000. It was the hope of the donor that this fund might be the nucleus of similar gifts which in time would prove a substantial and permanent endowment; the income of which would be a potent factor in the educational work of the Institute.

It is my privilege to recommend to you that this fund be now named, in honor of its donor, the Waid Educational Fund and so carried on all our records.

That his hope for additional gifts may soon become a certainty, I commend to your attention.

The central offices of the Institute are in the Octagon House. The ownership of this historic building, so intimately connected with the history of our country, was made possible by the generous gifts of architects who realized the desirability of a permanent home for the Institute.

The increasing difficulty of finding suitable meeting places for our convention has prompted the study of possible improvements in the Octagon property and the erection of such buildings thereon as shall provide a carrying income and a suitable place for our meetings and exhibitions. Studies for this development will be presented to the Convention and will deserve consideration.

There are many other activities, to which I might as properly call your attention. The work of our Education Committee, the Committees on Public Information, Contracts, Registration Laws, Historic Monuments, War Memorials, Community Planning, Fire Prevention, and others, are all worthy of consideration, and I hope you will give them your attention in due course.

I should fail utterly did I attempt to put into words an adequate expression of the hearty co-operation, the gracious acceptance of committee assignments, and the unswerving loyalty with which you have met and aided my efforts to carry on the Presidential Office. It has been a revelation of good fellowship, real friendships, and co-operation, such as I did not dream I could evoke and I cannot express my appreciation. To Mr. Parker, who does everything he should, and many things I should, so well and so satisfactorily, that I would far rather he did them than I; to Mr. Kemper, whose unfailing vigilance and accurate mind keep us all posted as to our duties, whose enthusiasm for the Institute and loyalty make him so effective an Executive; to the Directors and the other officers, who have so thoughtfully assisted me, I owe a never to be paid debt of thanks. It must go on interest; I can never discharge it: and finally, to you all, who have given me two years of great responsibility, but years of privilege and opportunity, I make my grateful acknowledgments.

# THE COMMITTEE REPORTS

As in previous years, the reports presented by the various Committees are valuable documents. They represent the most patient research and a most unselfish contribution of valuable time. In fact, these reports are the foundation stones on which the Institute may erect the most effective structure.

### Committee On Education

This Committee has presented the most voluminous and complete report of a series remarkable for research and practical suggestion.

The report states, in part:

Your Committee is pleased to be able to report that during the period thus reviewed the conditions surrounding architectural education in this country generally have materially improved. Architecture is not only better taught but the schools are better places in which to teach. In such schools as we have been able to visit we have found an atmosphere of sincere creative effort and honest, friendly emulation that must be helpful to all the students. To the best of our knowledge and belief, in all the schools the Faculties are sincerely working in a direction which is entirely in sympathy with the thought of this Committee.

Among all the different influences that have been at work to bring about the improvement which we have noted, it is difficult to select that one institution or individual to whom the greatest credit is due. Patently, the most potent factor has been the mutual confidence and resulting co-operation between all who have this important subject at heart.

We are definitely of the opinion that it is only the exceptional college graduate who at graduation is fit to practice architecture as a principal. We believe that practice in an office is as essential to the architect as hospital residence is to the doctor.

As to the proper length of the course in architecture, it seems to us that the type of candidate for a degree in architecture is so varied that it is impossible and probably unjust to measure the excellence and completeness of a school's curriculum by the length of residence required from the candidates for a degree. While we recognize the difficulty of making a course flexible in this matter of length of residence and hesitate to recommend a method, we believe that the system of values given for work accomplished, in partial use in several schools, is probably the best solution of the difficulty. Such a system enables men of superior gifts to advance more rapidly than their less fortunate fellows. At the same time it should meet the criticism that methods of education which are good for the average tend to hold back the more talented.

In reviewing the development of architectural education, your Committee has frequently had occasion to comment upon the splendid work of the Beaux-Arts Society, now known as the Beaux-Arts Institute of Design. Some years ago the Committee urged the creation of intercollegiate competitions, believing that, first, the solution of the same problem by a great number of students in different sections of the country was of interest, and second that emulation among the colleges stimulated to greater effort. While these intercollegiate competitions have proven difficult to bring about, today most of the schools use the programs of the Beaux-Arts Institute of Design more or less This results in placing the work of many of the colleges in competition with the work of the ateliers all over the country. We understand that the Faculties are generally agreed that a more general use of these programs is to be desired and we have been present at informal discussions of representatives of certain of these Faculties where a closer co-ordination of the schedule of the Beaux-Arts Institute of Design with the colleges has been urged. We now understand that steps have been taken looking towards the writing of programs by a joint commission of the Association and the Beaux-Arts Institute, and we sincerely hope that this may lead to a closer co-operation between the schools and the Beaux-Arts Institute of Design. It seems to us that such a development cannot fail to be helpful.

The American Institute of Architects should, we think, recognize the admirable work of the members of the Beaux-Arts Institute of Design. The great responsibility entailed upon the Chairman of the Committee on Education of that body in the conduct of this national work has perhaps never been fully understood. The unselfish devotion to the cause of education, of men like Lloyd Warren, Henry Hornbostle, Bosworth and many others, is worthy of our every admiration.

It will be recalled that at the last Convention there was considerable discussion as to the best disposition to be made of the income of the $25,000.00 fund which had been anonymously donated to the Institute during the previous year. No decision was reached in the course of the discussion. The matter was left in the hands of the Board for decision with the result that your Committee has been directed to expend the funds available in defraying the expenses of lectures on the Appreciation of Art in such institutions as the Committee might deem wise.

It would seem to your Committee that proper application of these funds under the Board's direction was to make arrangements for lectures to be given on the Appreciation of Art, so far as might be in out-lying institutions, that is, in places where no opportunities for the study of the fine arts exist. We have, therefore, continued our very pleasant relations with the Committee of the Association of American Colleges, asking their advice as to where these lectures could be given to the best advantage.

Your Committee selected Mr. C. Howard Walker to deliver lectures, and he has spoken in seven different institutions of the Middle West and in two schools in New England.

Finally, we request

First: That the Convention discuss the creation of ten Institute graduate scholarships and authorize their creation by the Board in the amount of $300.00 apiece, subject to a satisfactory proposition being received during the coming year from the Association of Collegiate Schools of Architecture and this Committee, looking towards the recognition of one school as the premier graduate school.

Second: That the Convention authorize a subscription to the Beaux-Arts Institute of Design for the support of their admirable work in education.

Third: That they accept our recommendations creating the Henry Adams Fund. And

Finally: That they pass the resolution addressed to the College Entrance Board.

### Committee On Registration Laws

The report of this Committee is a clear discussion of existing registration laws, and the necessity for codification and re-arrangement.

It presents valuable suggestions which, if accepted and carried to finality, would serve to correct what, in many instances, are unjust and discriminatory conditions. Some of the matters discussed are set forth in this report as follows:

Your Committee has no recommendations to make in relation to the Model Law as adopted by the Institute; this Model Law has and is serving as a good guide wherever laws are being prepared; it embodies the fundamental principles of all statutes establishing professions by law.

The states having registration laws and which have been reported to your Committee, are as follows:

| | |
|---|---|
| Arizona | New York |
| California (N. & S. Dist.) | N. Carolina |
| Colorado | N. Dakota |
| Florida | Oregon |
| Georgia | Pennsylvania |
| Idaho | S. Carolina |
| Illinois | Tennessee |
| Louisiana | Virginia |
| Michigan | Washington |
| Minnesota | West Virginia |
| Montana | Wisconsin |
| New Jersey | |

In all these states the laws establish certain minimum requirements for preliminary education. In some states such preliminary education is ascertained by the Boards appointed to examine the applicants for registration and in other states by an established department of education.

The preliminary education, as required, varies to a great extent in all the states; from "a good common school education" to a required course of two years in a college or university granting the degree of B. A. or B. S.; the course usually covering History, Mathemathics and Language; in some cases a foreign language.

The variation in the requirements relating to preliminary education has acted as a barrier to an interstate agreement on the approach to the technical examinations; it has led to a refusal of some states to accept a certificate from other states where the preliminary education is not the same by statute, notwithstanding high averages in technical examinations. Naturally the states which have established the higher degree of preliminary education are not willing to lower their standard and thus take a backward step.

Most of the states establish a minimum of technical training by recognizing certain Schools of Architecture as having competent courses. Uniformity of recognition of college courses in architecture would be a great step forward and can be accomplished by the Institute. The accepted technical training in schools is usually supplemented by a required period of experience in an architect's office; this period should be made uniform.

Registration laws with few exceptions, are the result of recent legislation, consequently each state has taken care of its "own" under waiver conditions extending for a limited period. While the particular state accepts its "own" it rarely accepts a similar class from another state; this puts the waiver architect in a bad position unless he is willing to go to school again and pass on such subjects as some Board may deem vital for his qualification.

The "ten years'" clause modifies this awkward situation and should be included in every statute.

Some states which require almost no preliminary education will not accept a certificate from another state requiring a college course in preliminary education, because the "college course state" insists that the "no education state" has not met the maximum. This seems to be a narrow policy but is a natural resentment.

The registration laws are not unique and the same interstate difficulties apply to all the professions but other professions are not so likely to have their work extending into other states.

Your Committee has not considered the question of joint Boards of architects and engineers; it does not seem to have anything to do with the tests provided under the laws and is purely a question of administration.

### Committee On Small Houses

This report, presented by Edwin H. Brown, Chairman, interestingly relates the activities of this important Committee during the past thirteen months.

Mr. Brown states:

Because of the novelty of the Bureau idea, the lack of possible precedent, the necessity for the maintenance of all the ideals and standards of the American Institute of Architects it has been necessary to proceed with the most meticulous care, and many times with a slowness that has deterred many from taking the part in the Bureau work that they might otherwise have taken. The lack of funds, due to the general poverty of the profession, after years that have been, in general, extraordinarily lean, has also aided in retarding the progress of the Bureau. And yet, with all these things and others I am astonished and somewhat appalled at the tremendous strides made by the Bureau.

The report then sets down and answers a series of questions that have been asked with reference to the work of the Committee.

It is distinctly up to the profession of architecture, and particularly up to the American Institute of Architects, to carry this thing through. By their action of last year they stated that they could and would help in this way to solve the small house problem. This statement has been accepted by the Department of Commerce of the United States. Neither the American Institute of Architects nor the Bureau can afford to let this statement of faith in them be unfulfilled. They must and will make the success of the Bureau that it is bound to have.

All the officers of the Bureau are working, like the officers of the Institute without salary. It is a big job and they need the assistance and encouragement of every architect in the country. They have nothing to gain by it financially. For that reason they can honestly ask for your assistance and your money which will come from joining the Bureau. They see a wonderful thing for the profession to do and are trying to carry it out as best they can, with practically no financial means and little help at the present time.

### Committee On Preservation of Historic Monuments and Scenic Beauties

As in previous reports your Committee again recommends the formation of Chapter Committees to extend the influence of the Institute in this field of its activities. Such local committees especially in sections of the country rich in natural and architectural monuments offer the most direct means of influencing public opinion. Also through local organizations the support of such activities is more readily obtainable than through dependence on the budget of the Institute.

As an example of the value of local effort, the activities of the Chapters' Committees in New Orleans and Philadelphia have been referred to in previous reports. In this connection and with reference to a monument of national interest it may be noted that largely through the efforts and in accordance with the researches, surveys and plans prepared by the Chapter Committee, the City of Philadelphia has undertaken during the past year to restore the Old City Hall, one of the Independence Hall group and the original architectural counterpart of Congress Hall previously restored under the supervision of the Chapter Committee in 1914. The City Hall aside from its local historical associations and architectural interest, was the seat of the Supreme Court of the United States during the decade prior to 1800.

The City authorities in Philadelphia have also called upon the Chapter to make further researches and prepare plans for the restoration of Independence Hall, the original building of the group and the Chapter Committee has this work now in hand, and during the past year the committee has also made a survey and prepared plans for the restoration of the Bartram Mansion owned by the City of Philadelphia and preserved as a memorial of the first American botanist, John Bartram.

### Committee On Public Information

The report of this Committee is practically a discussion of the brochure recently issued to Chapters. This document provides material for at least one year's work of public information through newspapers local to the various chapters. As far as it goes, the report outlines a valuable proposed effort. There may be, however, an honest difference of opinion as to just what is the most valuable "public information" as relating to the practice of architecture.

The report states:

> Your Public Information Committee believes that the issuance of this document is a definite accomplishment and: That at least for one year, until the time of the Fifty-sixth Convention, no Chapter can say that it has not been supplied with a complete public information program and a large part of the material with which to carry it on. The National Committee cannot go into the territory of any Chapter and start a public information program. It would not do so if it had unlimited funds. The contact between the Public and the Public Press on one hand, and the architectural profession on the other, must be established by those in the locality concerned and not by an outside agency. It is apparent from the experience of the past 60 years that the Public, and the Public Press are not frequently coming to the architect seeking news and information of mutual interest. So, if the architect desires such mutuality he must take the initiative.

Educating the public as to the functions of architects, the important, even commanding position they hold in the second largest industry in this country, is, of course, desirable. But it would seem that some provision should be made and a dignified form of expression agreed on to communicate to the editors and publishers of daily papers and, unfortunately, some technical publications, the exact facts that will correct the many misleading statements that are constantly appearing. The Sub-Committees in the various chapters would provide a valuable service should they secure a correction of misleading statements in the publications where they originated.

### Committee On Structural Service

This report is the most voluminous of all the many presented at the convention. The Committee's activities, as conducted in the past, were to gather, co-ordinate and pass on to Institute members all the valuable data that might be available as to structural material. To quote the report, "the work of the Committee on Structural Service, broadly speaking, is devoted to the development of an adequate structural technique." A most admirable thing to accomplish and when competently carried forward undoubtedly of great value to the members of the Institute this Committee has been formed to serve.

Attached to this report is an appendix with reference to a joint conference on Better Advertising to Architects.

The action of the convention on this report and appendix will be found in the report of the convention's proceedings.

### Building Committee

In the Octagon property at Washington the Institute possesses a house whose architecture and traditions fulfill the highest ideals. It has always been the aim of the Institute to treat this property with the veneration and respect to which it is entitled. Two schemes of restoration have been considered by the Committee.

The first, a restoration to its original probable condition as a one-time private residence of the period of A. D. 1800. Such a scheme, states the report, would leave the Institute rather remotely identified with the Octagon House; would be of doubtful benefit to the Institute or to the public; and quite surely would burden the Institute financially beyond any practicable limits.

Second, the Committee considered the point of view which contemplates restoring the Octagon House and grounds to their supposed original condition and equipping the first and part of the second stories with reproductions of the choicest furniture of the period, including here and there, when available, an historic original piece. The House would be a residence museum standing before the public as an example of the best taste in furniture and decoration dating back to Colonial days. At the same time the House would be the home of the Institute and headquarters for architects visiting the Capitol City. The drawing room would be available for formal receptions and for meetings of the Boards of Directors. A portion of the second story would not be profaned but used as an office for Institute activities, and every visiting member of the profession would feel that his organization had a close association with a beautiful home of the early days of the nation, a home which sheltered the President when the White House was burned, and which was the scene of the ratification of the Treaty of Ghent. This second idea includes also erecting a convention hall and architectural exhibition and committee rooms. The new construction should be less in height and designed to form a harmonious setting and background for the Octagon House.

### Community Planning

The Committee, in its report, states that leadership awaits the architect in the vast field of city planning. The report states:

> In spite of the need of the comprehensive planning for our cities, planning where undertaken at all in America is generally piece-meal. Zoning plans, street plans and recreation plans are made and frequently carried into effect. But the result is a desultory mosaic lacking the saving grace of co-ordination. It is a method, which over a space of time, spells waste. The neglect of the proper conception of the needs of the community as a whole is largely due to the indifference of the architect himself. Among all the professions he alone is trained as a planner, but he has permitted the activities in this field to fall into the hands of those who are chiefly interested in special phases of the problem. Leadership awaits the architect in the vast field of city planning only when he supplements his fundamental qualifications by a very thorough understanding of political and social science and the relation of the inanimate physical city to the human factor that gave it the breath of life.
>
> Communities, large and small, are now growing dimly conscious of the chaos into which individual interests have plunged them. They must and will insist on the collective planning and control of their future growth; such is the only law of their own self-preservation. The immediate future will demand a type of architectural leadership far eclipsing the services now sold to individual clients. The field of the architect and his outlook must be brilliantly enlarged.

### Treasurer's Report

The report of the Treasurer, D. Everett Waid, is one that should afford Institute members much satisfaction. It shows that the finances of the Institute are today in most excellent shape.

It is interesting to learn from this admirably prepared document that the Institute membership has more than doubled during the past ten years, having increased from 1096 members in 1911 to 2211 at the close of 1921.

The actual expenditures for 1921 were approximately \$43,500. The budget for 1922 contemplates an outlay of \$53,500. The Institute's appropriation for structural service has rapidly increased during the past three years. It was \$203.63 in 1919, \$572.50 in 1920, while in 1921, \$2,750 was expended. The appropriation for this service for 1922 has been increased to \$3,500.

The Institute's appropriation for the *Journal* has increased from \$1,500 in 1915 to \$6,000 for the current year. The report states that those figures include \$2.50 each for sending the *Journal* to every member, beginning in the year 1921, but does not include some \$50,000 of working capital covered by an issue of bonds to individual members of the Institute.

Villa della Rosa
Battaglia, Italy

From the Photograph by
Robert M. Blackall

# ·EDITORIAL·COMMENT·

A LONG WHILE AGO, there was written a delightful book, for both old and young, called "Tom Cringle's Log." It related the cruising adventures in a small schooner of three wealthy gentlemen among the islands of the Carribean. One of these, a *gourmet,* could only recall the aspect of any place he had visited when reminded of what he there had to eat or drink.

The blasé attendant at Institute conventions sometimes finds his only novelty in referring to those social gatherings that are the result of the fine activities of the entertaining chapters. He finds, as he has learned to expect to find, that there is the same earnest endeavor throughout all the various sessions to debate the problems of the profession in the most serious, thoughtful and conscientious manner. He feels safe in leaving to those who have these matters in hand all the vital elements but he will not forego the, to him, solemn duty of participation in these discussions, if, even in the end, they finish exactly where they have left off.

Having thus taken upon himself for a brief period the responsibilities which his high position as a delegate confers, he feels he has earned the right to relaxation and he joyfully accepts the fine program presented.

At San Francisco, before the adoption of a certain much discussed amendment to our Constitution, delegates were entertained in many ways, the recollection of which must have stirred up happy memories during the torrid heat of the convention at Chicago just brought to a successful conclusion. At St. Paul, there was much to see in either of the Twin Cities or the terrain that divides them; at New Orleans, the French town, and trips to old plantations, while at Nashville the Barbecue at the Hermitage will always be remembered, particularly by those who were so fortunate as to receive that splendid Southern hospitality, particularly as to the little tent wherein a fortune teller read the palms of the delegates and stimulated with the fires of a renewed ambition.

Reference to those milestones in the history of the Institute conventions is not as frivolous as may seem. These gatherings have served to keep alive and foster a fine fraternal spirit that does not have its birth and death during convention days, but survives and creates a feeling as brotherly as the most highly developed fraternal society.

As to the general results of this convention, there can be little added to the detailed reports that appear in this issue. It was a good, hard-working and constructive meeting. In fact it may be said, without indulging in the over-enthusiasm that generally attends the description of a last convention, that it got things done and that the things it did were the big constructive things that count.

The American Institute of Architects is today more representative of its profession than it has ever been of late years. That the profession shares this confidence is shown by the steadily increasing membership.

Much of the visionary has been eliminated. Not all, for enough of that is left, as it should be, to show that architects are artists, but the Institute begins to realize that the world moves, and that to be a good artist a man must be levelheaded. He must have his feet on the ground and if he has, we may not censure him if occasionally he shoves his head through the clouds.

* * *

WHEN A PIECE of machinery functions well, we admire the accuracy of its parts, but we often fail to learn whose master mind created it. Just exactly in the same way as does the average newspaper reporter. He dilates on the beauty of a building, he gives much space to "the prominent citizens" who own it, and he even gives the names of the ladies who pour the tea. But he forgets all about the architect.

Conventions of the Institute are the smoothest working of functions. Everything happens on time, everyone's questions, reasonable or unreasonable, get a prompt and intelligent answer. The convention opens, runs its course and dissolves. But for days before and days after, a certain quiet-spoken, efficient young man is competently doing the work he seems to be born to do. This, as most of us know, is E. C. Kemper, the Executive Secretary of the Institute,—the man every one leans on from the President down.

Mr. Kemper richly deserves any words of commendation we may set down here. Boards may come and Boards may go, Presidents are elected and pass, but Kemper with no thought of persons serves the Institute with all he has. It is so easy to censure, easier to ignore. It seems that these few words are little enough to offer in appreciation of the work of so competent a man.

* * *

OF COURSE, W. Stanley Parker and D. Everett Waid were nominated and elected with a unanimous vote to the respective offices they have for the past few years filled. Both of these men, absorbed with all the many cares of private practice, have yet unselfishly given a service the high quality of which is above computation. They have and hold the respect and confidence of the entire profession.

Mr. W. B. Faville, the newly elected President, logically reaches his high position from the first Vice-Presidency.

The Presidency is now transferred from our Eastern seaboard to the shores of the Pacific. This change of location of the Presidency serves to make the Institute a body representative of the entire country,—a real American Institute of Architects. Mr. Faville will, of course, expect and he will, of course, receive the finest co-operation of the profession and, may we add, also that of the architectural press all over the country.

* * *

**COINCIDENT WITH THE** closing of the convention of the American Institute of Architects, was the announcement of the Chicago *Tribune,* that it would offer $100,000 in prizes for designs for a proposed new building to be erected on North Michigan Avenue.

The further announcement that this important competition would be governed by the rules as set forth by the Committee on Competitions of the Institute and that the Jury of Award would have for its chairman the president of the Illinois Chapter, was, quite naturally, received with enthusiasm by the delegates to the convention. No architectural event of recent years will have greater importance or wider significance than this competition, which establishes a record in the amount it offers to secure the best possible design.

In deciding to hold this competition under the rules of the Institute, and practically under its supervision, the publishers of a great daily newspaper have shown fine judgment, and given a pledge to the world at large of their intention to surround every element of this great undertaking with the best possible architectural safeguards.

To the officers and members of the Institute, this mark of confidence will undoubtedly bring a sense of deep satisfaction.

At the very outset a result is assured, that will secure the erection in Chicago of a building that will be a fine adornment in a city that is so earnestly striving to achieve the very highest ideals of monumental beauty. The site of the proposed structure affords unusual opportunities for the placing of a monumental building, commanding long vistas. The enthusiastic approval of the citizens of Chicago of the *Tribune's* great project shows a fine civic spirit.

The details of this competition will be found on page 543 of this issue.

WAR SCENES IN WOODEN SHIPYARDS

*(From the original aquatint by Frederick K. Detwiller)*

APARTMENT HOUSE, NO. 630 PARK AVENUE, NEW YORK

J. E. R. CARPENTER, ARCHITECT

5121


DETAIL OF PRINCIPAL ENTRANCE
APARTMENT HOUSE, NO. 630 PARK AVENUE, NEW YORK
J. E. R. CARPENTER, ARCHITECT

512 2

APARTMENT HOUSE, NO. 116 EAST 58TH STREET, NEW YORK

J. E. R. CARPENTER, ARCHITECT

5123


APARTMENT HOUSE, NO. 3 EAST 85TH STREET, NEW YORK

J. E. R. CARPENTER, ARCHITECT

*(See typical floor plan shown elsewhere in this issue)*

512[4]

APARTMENT HOUSE, NO. 907 FIFTH AVENUE, NEW YORK

J. E. R. CARPENTER, ARCHITECT

*(See floor plans shown elsewhere in this issue)*

5125

DETAIL OF PRINCIPAL ENTRANCE

APARTMENT HOUSE, NO. 907 FIFTH AVENUE, NEW YORK

J. E. R. CARPENTER, ARCHITECT

512

GARDEN WALL

HOUSE OF MRS. LEOPOLD CAHN, HARTSDALE, N. Y.

ALFRED HOPKINS, ARCHITECT

*(See floor plans shown elsewhere in this issue)*

512

HOUSE OF MRS. LEOPOLD CAHN, HARTSDALE, N. Y.
ALFRED HOPKINS, ARCHITECT

5-12

ST. LAWRENCE SCHOOL, WEST HAVEN, CONN.

BROWN & VON BEREN, ARCHITECTS

*(See floor plans shown elsewhere in this issue)*

512


STRONG SCHOOL, NEW HAVEN, CONN.

BROWN & VON BEREN, ARCHITECTS

*(See floor plans shown elsewhere in this issue)*

5½"

A HOUSE AT
OAK KNOLL, PASADENA, CAL.

MYRON HUNT,
ARCHITECT

(See floor plans shown elsewhere in this issue)

5 1/2"

DINING ROOM

LIVING ROOM

OWNER'S BEDROOM

A HOUSE AT
OAK KNOLL, PASADENA, CAL.

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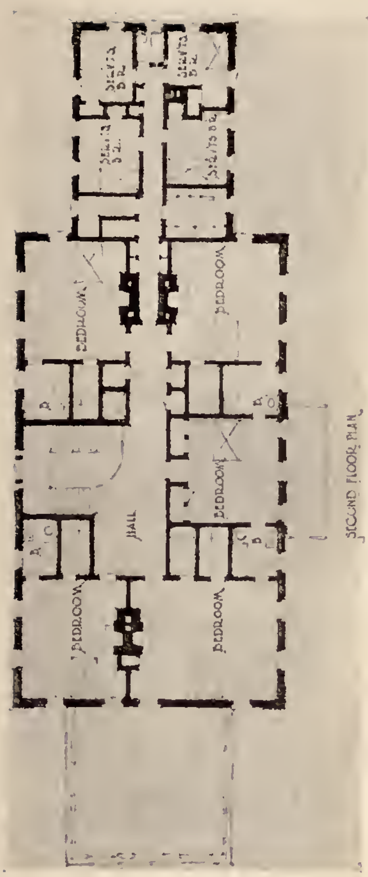
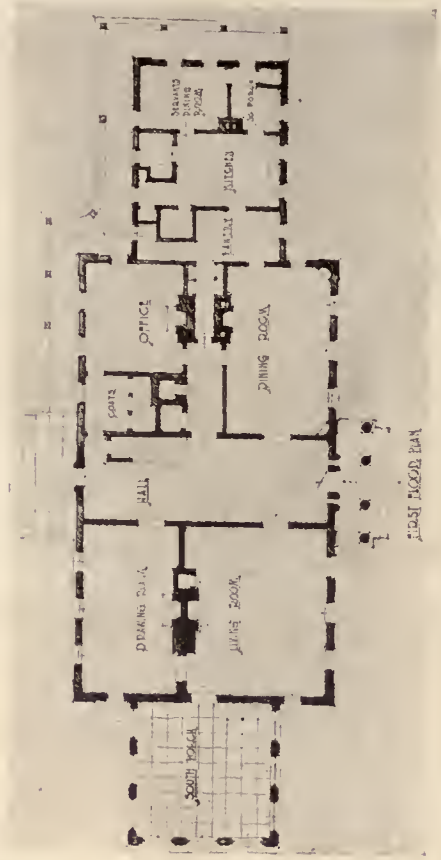
MYRON HUNT,
ARCHITECT

5-12 12

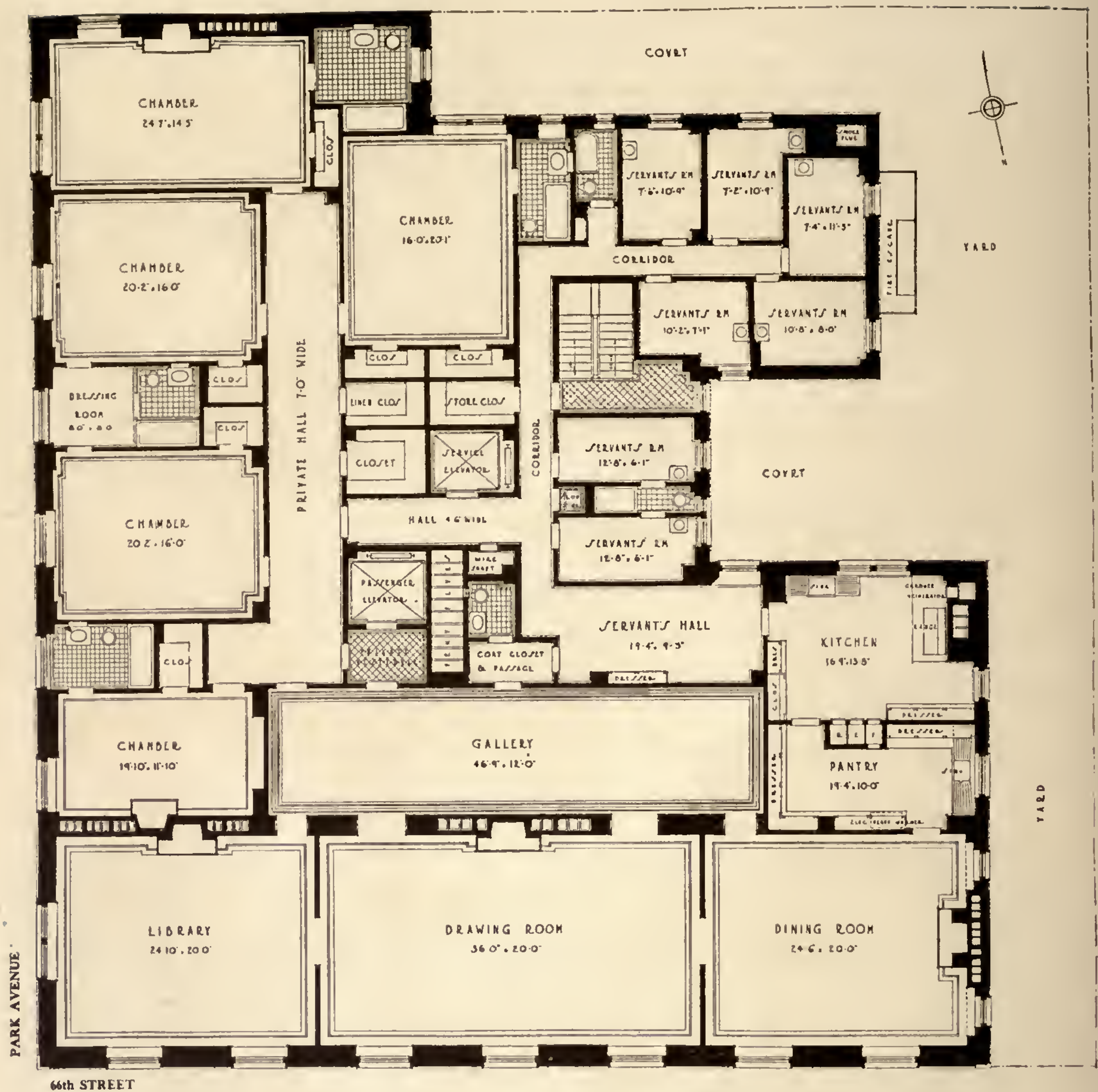



A HOUSE AT OAK KNOLL, PASADENA, CAL.

MYRON HUNT, ARCHITECT

*(For exterior and further interior views see Plate Section)*

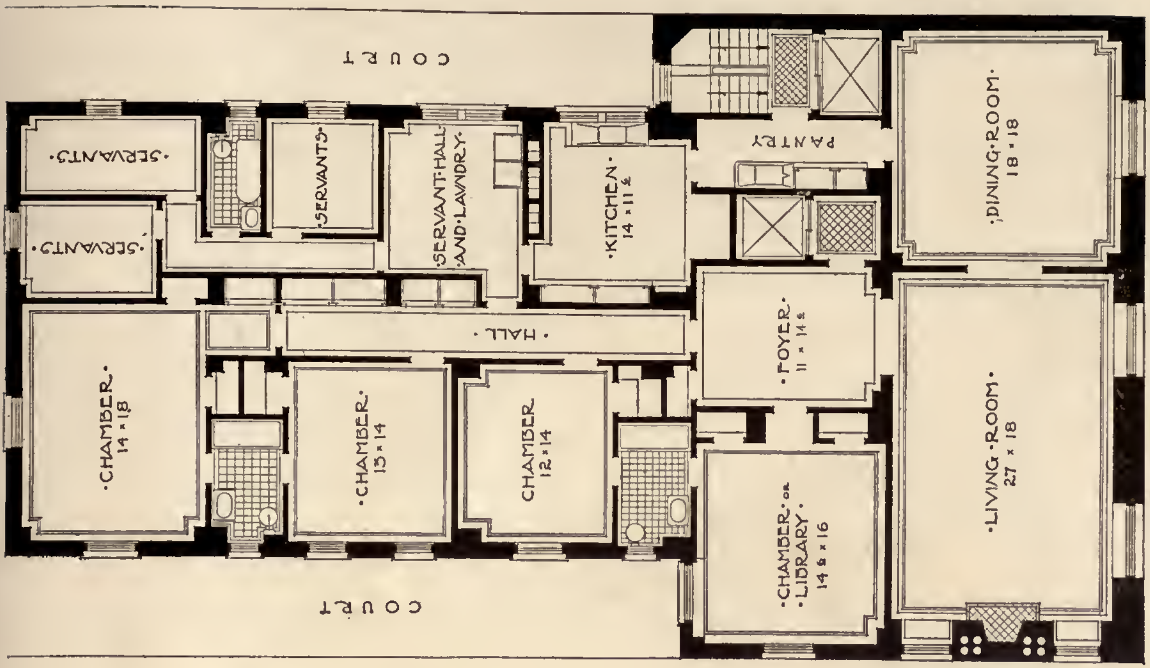



TYPICAL FLOOR PLAN

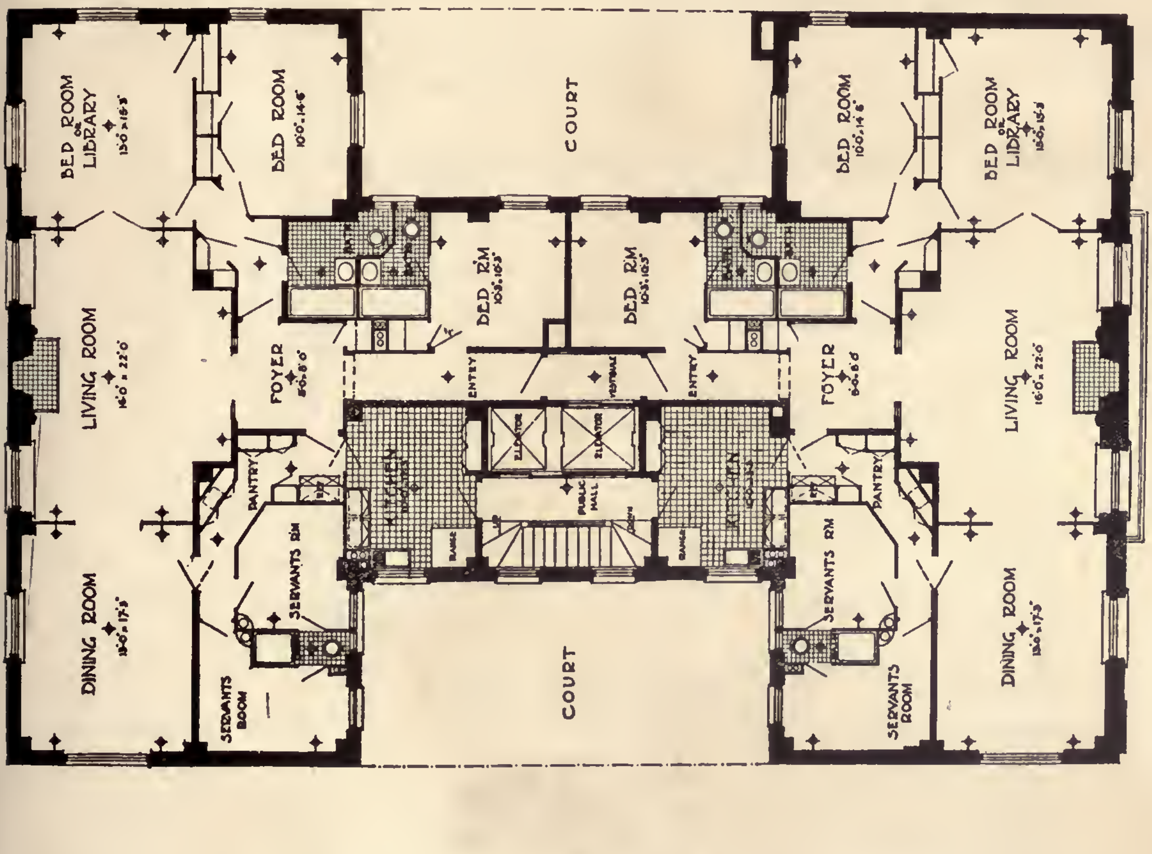
APARTMENT HOUSE, NO. 630 PARK AVENUE, NEW YORK

J. E. R. CARPENTER, ARCHITECT

*(For exterior views see Plate Section)*




TYPICAL FLOOR PLAN, 3 EAST 85TH STREET




TYPICAL FLOOR PLAN, 116 EAST 58TH STREET

TWO APARTMENT HOUSES IN NEW YORK, J. E. R. CARPENTER, ARCHITECT

*(For exterior views see Plate Section)*

SECOND TO FIFTH FLOOR PLAN

FIRST FLOOR PLAN

APARTMENT HOUSE, NO. 907 FIFTH AVENUE, NEW YORK, J. E. R. CARPENTER, ARCHITECT

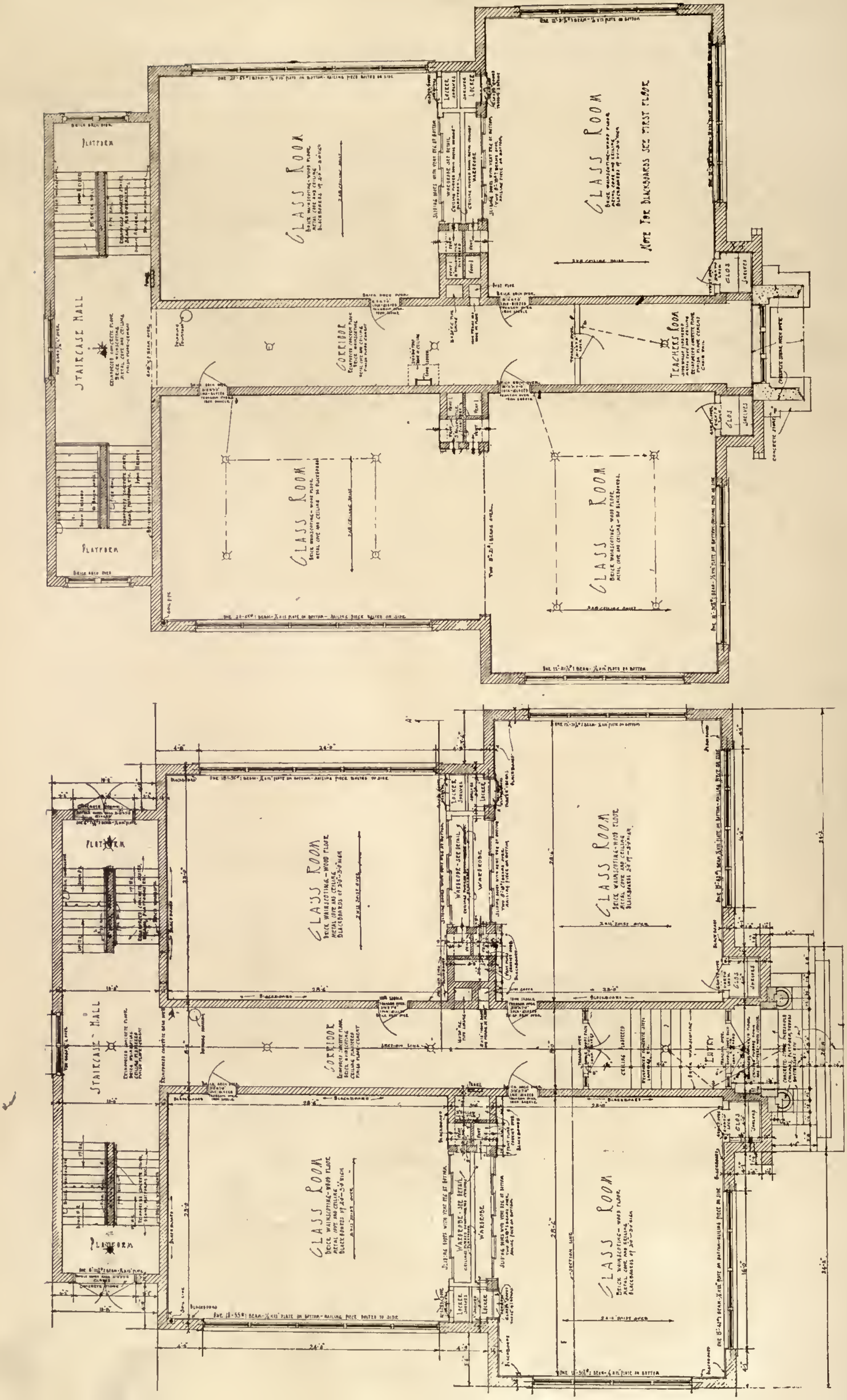
*(For exterior views see Plate Section)*



HOUSE OF MRS. LEOPOLD CAHN, HARTSDALE, N. Y.

ALFRED HOPKINS, ARCHITECT

*(For exterior views see Plate Section)*

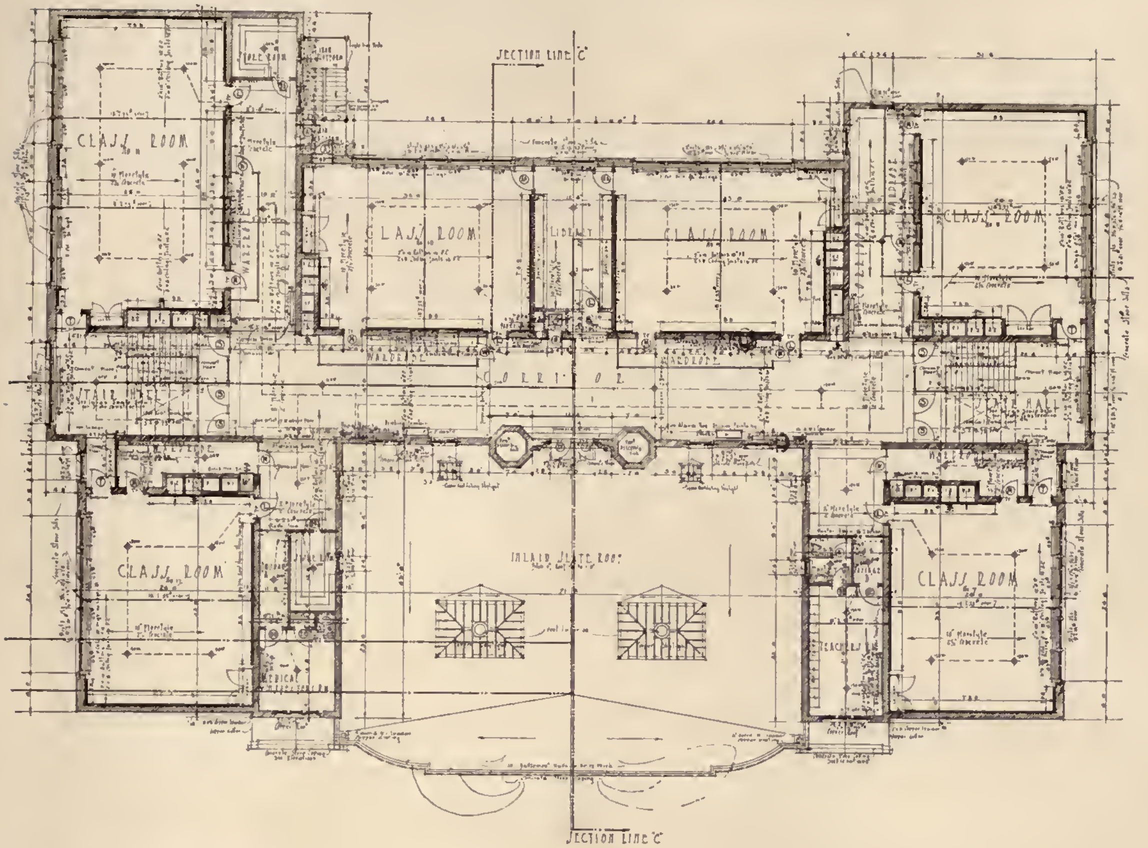


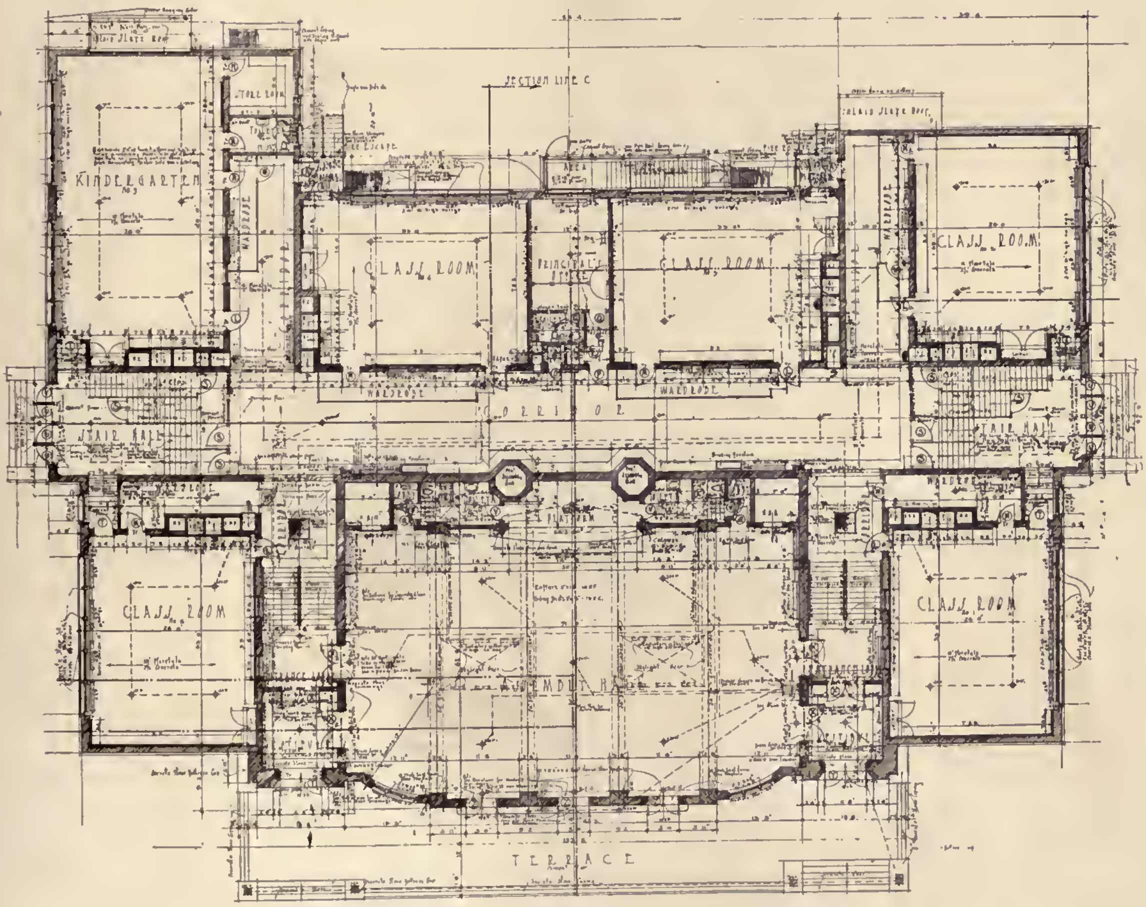

FIRST AND SECOND FLOOR PLANS

ST. LAWRENCE SCHOOL, WEST HAVEN, CONN.

BROWN & VON BEREN, ARCHITECTS

*(For exterior view see Plate Section)*




FIRST AND SECOND FLOOR PLANS

STRONG SCHOOL, NEW HAVEN, CONN.

BROWN & VON BEREN, ARCHITECTS

*(For exterior view see Plate Section)*

# STAINED GLASS—II. (Continued) HISTORICAL PERIODS

BY JOSEPH G. REYNOLDS, JR., Craftsman

EARLY in the thirteenth century there came into use in France a new type of ornamental design called grisaille, composed chiefly of tints of white glass with spots and strips of pure color in geometric forms with a foliated pattern woven in and through them, (Fig. 5). No doubt this grisaille glass became popular on account of its being relatively inexpensive, and because it furnished a means of giving a soft, grey light wherever needed without the glare which plain, undecorated glass produces.

Beautiful thirteenth century grisaille may be found in Salisbury Cathedral, and the "Five Sisters" at York, likewise, are prized by every glass lover.

Fig. 5. Late Thirteenth Century Grisaille from the Cathedral at Chalons-sur-Marne

### Middle Gothic or Transitional Glass, Fourteenth Century

Broadly speaking, the fourteenth century was a period of transition between the virile archaism, the strong rich color, the direct bold treatment of the early work and the weak pictorialism, the faded color, and the delicate treatment of the later Gothic. As has been so often remarked, naturalism of ornamental detail was a distinguishing characteristic and this naturalistic feeling finally killed the last vestige of the classical influence of the early Byzantine traditions.

Early in this century it was discovered that white glass painted with a solution of silver and subjected to the heat of a kiln would be stained yellow, the tint varying from pale lemon to deep orange.* The quality of this yellow stain was distinctly different from the pot-metal color used heretofore. Being practically on the surface of the glass it had a transparency and brilliancy, in contrast to the depth and richness of the twelfth and thirteenth century pot-metal, in which the color was diffused throughout the body of the material. In the early twelfth and thirteenth century windows where strong colors predominated this pot-metal yellow held its place, but when larger quantities of white glass came into use the lighter and more delicate yellow stain was far more harmonious. This fact is clearly proved by comparing the earliest fourteenth century canopies (which, being cut in pot-metal yellow, were heavy and hot in appearance), with the later ones, where white glass and silver stain were employed to produce beautiful effects. Thus, the discovery of silver stain had a great influence in modifying the course of design from this time forward, no doubt encouraging the more abundant use of white glass.

In illustration Fig. 6 we have an example of fourteenth century transitional work. Single figures of Old Testament characters in blue, green, gold, and white on ruby backgrounds and in pur-

*Even to the present day this is the only instance in which the honest craftsman ever attempts to paint a transparent color on his glass. Red, blue, green, and other enamel colors painted on glass will perish with age but centuries of use have proved that this silver stain is absolutely permanent.*

ple, green, gold and white on blue backgrounds are placed under architectural canopies. These canopies in full colors and whites are larger and of greater importance than any heretofore used. Above and below these richly colored figure sections are units of grisaille. The broad borders common to earlier work are necessarily smaller in these windows on account of the narrowness of the lancets. As the particular example here shown belongs to the first part of the fourteenth century, naturalistic tendencies in the details of the ornament are not strikingly in evidence. But in the drapery of the personages it may plainly be noted that smear shading is now commonly relied upon to give a sort of flat bas-relief modelling of form.

Taken as a whole, fourteenth century glass is the least interesting period of Gothic, for while there has been a straying away from the early traditions the new spirit has not reached the freedom of later achievement.

### Late Gothic Glass—Fifteenth Century

The outstanding characteristics of fifteenth century glass are the use of the architectural canopy, the large proportion of white glass, and the extraordinary delicacy and finish achieved in the painted work.

Fig. 6. Early fourteenth Century Window from Church of S. Urbain, Troyes

In twelfth and thirteenth century glass design the architectural canopy was a subordinate feature and took its place as a mere bit of ornament. It was leaded in low-toned whites and color and was an integral part of the design. In the fourteenth century the canopy assumed an importance entirely out of proportion to its value from the standpoint of good taste. In the fifteenth century the canopy work was sometimes used in an extremely effective way but more often it was a clumsy affair, a makeshift method of framing and ticing together separate figure subjects—a mode far inferior to the earlier custom of placing these subjects within medallions.

From the beginning of the thirteenth century onwards there was a gradual decline in the Art—a forsaking of the earlier principles of pure decoration for an ever increasing interest in pictorial effect and realism.

Of course beautiful windows were made in the fourteenth and the first half of the fifteenth century — windows in which the painter was still subservient to the glazier. But the fourteenth century worker was animated by a desire to diminish the gloom and darkness of the thirteenth century churches by letting in more light. This object was attained by employing more and more white glass, until finally the windows were no longer glorious in color. And so in the fifteenth century we find white glass predominating, and such color as was used never had the purity and brilliance of earlier times.

The difference between the thirteenth and the fifteenth century worker is, that one is primarily a glazier and glories in color, the other cares less about color, thinks first of painting, is primarily a painter. But the greatest opportunities for achieving beauty in glass lie in the use of splendid color. If beautiful in design and color a window may still be lovely even though painted by an inferior hand. But even masterly painting can never make a thing of beauty out of a window in which the color combinations are weak or are poorly proportioned.

In illustration Fig. 7 we have a good example of a typical fifteenth century window from the Cathedral of Bourges. A Bishop and a Pope robed in the richly embroidered ecclesiastical vestments of their time stand in niches formed by a highly developed architectural canopy. The space behind the figures is filled by a damasked curtain, not plainly shown in the illustration. In the panel containing the Pope, above the curtain and just below the groined vaulting of the canopy a distant city is painted in white and stain. It can easily be seen that the painter and not the glazier has the most to say in this window. The emphasis is no longer upon the color as it was in the glorious days of stained glass. The trace lines have now become relatively unimportant and the craftsman delights most in getting delicate effects of light and shade, beautiful textures and charm of technique. The ideal of the glass "painter" has almost been reached, (an ideal that has been unfortunately, all too dominant in modern times).

Fig. 7. Fifteenth Century "Canopy" window from the Cathedral at Bourges

### Renaissance Glass Sixteenth Century

In the sixteenth century, Renaissance "glass pictures" came into fashion. They were essentially pictorial in style; and exquisite drawing, high relief in shading, and atmospheric effects were striven for. Except for these mistaken ideals the glass of the first half of this century was honest enough in character. But in the second half of the century there was a sudden and rapid decline in craftsmanship, due principally to the discovery of soft enamel paints of many colors.

The painter was now in his glory. With nice even sheets of glass, clear white or of light tints, he could paint pictures as easily as his fellow artists could paint on canvas. The ideal toward which window design had been tending ever since the early Gothic days had at last been achieved!

But the results were most deplorable. The depth and purity of color of the earlier work were entirely lost, the glass was dimmed with heavy, opaque shadows, and owing to the expansion and contraction of heat and cold, the lightly fired soft enamels inevitably peeled off, exposing the thin white glass underneath.

Far from mellowing in tone, as mosaic glass does, it is characteristic of enamelled windows that they merely grow faded, obscure, and shabby. After a time robes painted in enamels look as though they had been moth eaten; the virtue has gone from them, the glory is departed.

Illustration Fig. 8 shows a portion of a sixteenth century window from the Cathedral at Chalons-sur-Marne. One panel depicts Cain slaying Abel and the other shows Adam and Eve at their daily toil. Symbolism plays no part in this work. The whole story is told as plainly as the painter could do it in the medium in which he worked. It would be very difficult even in our day to depict human passion and fear more graphically than is done in this Cain and Abel panel. Nobility of design, charm of color, spiritual atmosphere—all the possibilities for beauty inherent in stained glass, are deliberately sacrificed for pictorial effect.

The seventeenth and eighteenth centuries were a period of complete decadence in the craft, when translucence was sacrificed to painting, and the picture became more obvious than the glass.

*(To be continued)*

Fig. 8. Sixteenth Century picture Window, from the Cathedral at Chalons-sur-Marne

# SOCIETY OF BEAUX-ARTS ARCHITECTS



Official Notification of Awards—
Judgment of April 18th, 1922

Second Preliminary Competition for
the 15th Paris Prize
of the
Society of Beaux-Arts Architects

PROGRAM

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

"DEPARTMENT OF THEORY AND MILITARY RESEARCH IN A WAR COLLEGE"

In the neighborhood of Washington, D. C., is the site of a new War College made necessary by the technical developments of the late war. It consists of several departments and the Department of Theory and Military Research, subject of this program, is intended for the training of West Point graduates and seasoned line officers in the more profound theories of warfare. It is housed in a group of buildings entirely separated from the rest of the college.

The requirements are:

1. A small administration building.

2. Four buildings for class and lecture halls, each with a ground area of 5,000 square feet.

3. A building for the exhibition of relics, documents, etc., with an auditorium to seat about 300.

The treatment of the buildings should be of a monumental, military character, the grounds formally planned and laid out with trophies and memorials. The group will be completed by:

4. A chapel.

5. Dormitories for 300 students.

6. A mess hall.

7. A club house, which may be connected with the mess hall.

8. Six officers' houses.

The property is a rectangular plot 700' x 1,400', the main entrance will be on one of the long sides.

*Jury of Awards:*—J. G. Rogers, L. Warren, R. M. Hood,

E. L. Babitsky — John Huntington Polytechnic Institute

Placed 1st—Second Medal
A Department of Theory and Military Research in a War College

J. M. Howells, Welles Bosworth, A. Kahn and H. O. Milliken, Chairman.

*Number of Drawings Submitted:*—17.

AWARDS:—

PLACED FIRST—Second Medal:—E. L. Babitsky, John Huntington Poly. Inst., Cleveland.

PLACED SECOND—Second Medal:—L. Fentnor, Patron—F. C. Hirons, New York.

PLACED THIRD—Second Medal:—R. A. Fisher, Carnegie Inst. of Technology, Pittsburgh.

PLACED FOURTH—Second Medal:—J. G. Schuhmann, Jr., Columbia Univ., New York.

PLACED FIFTH—Second Medal:—E. W. Burkhardt, Columbia Univ., New York.

PLACED SIXTH—(1st Alternate)—Third Medal:—R. Bailey, Bronxville Road, Bronxville, N. Y.

PLACED SEVENTH—(2nd Alternate)—Third Medal:—C. E. Jenkins, Univ. of Penna., Philadelphia.

FIRST MENTION—(H. C. for Paris Prize):—A. G. Clay, Yale Univ., New Haven.

MENTION:—W. F. McCaughey, Jr., Chicago Sch. of Architecture, Chicago; G. K. Geerlings and H. S. Bent, Univ. of Penna., Philadelphia.


L. Fentnor

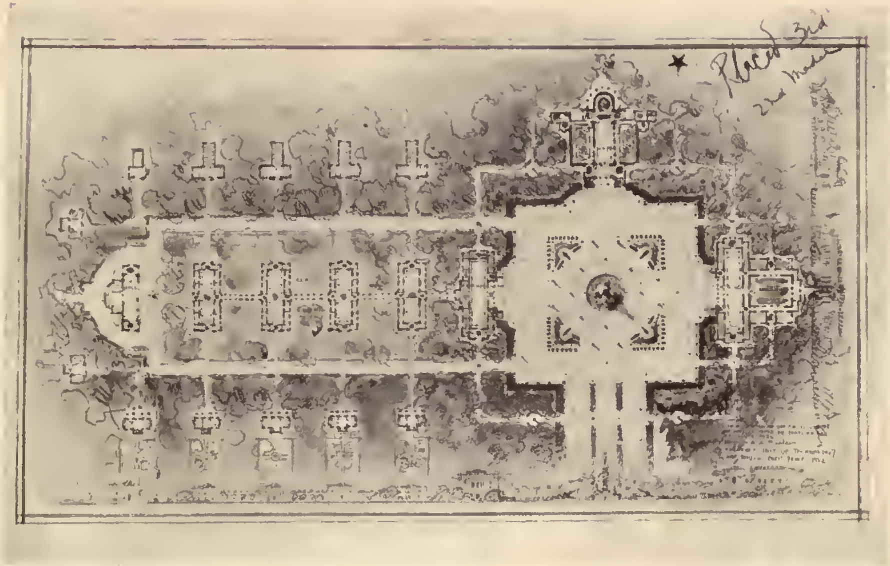
Patron, F. C. Hirons

Placed 2nd—Second Medal
A Department of Theory and Military Research in a War College

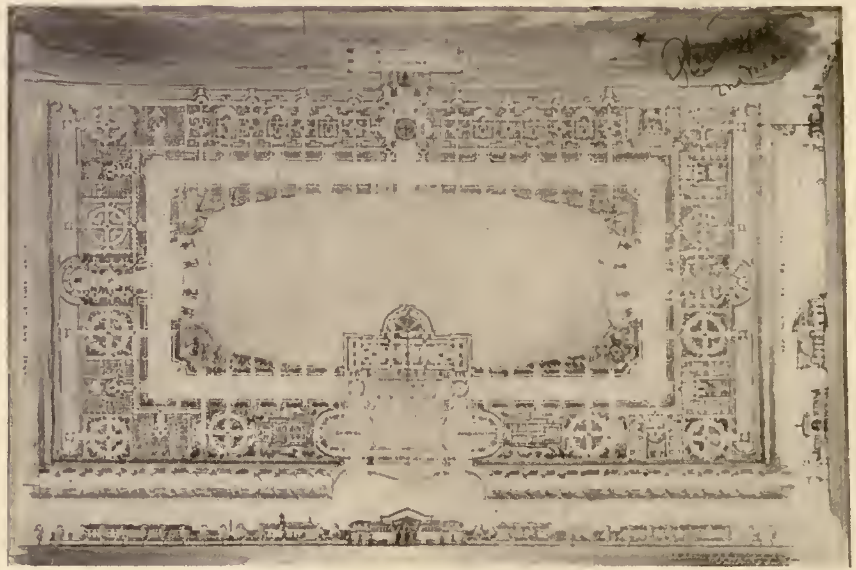
## SECOND PRELIMINARY PARIS PRIZE

A Department of Theory and Military Research in a War College

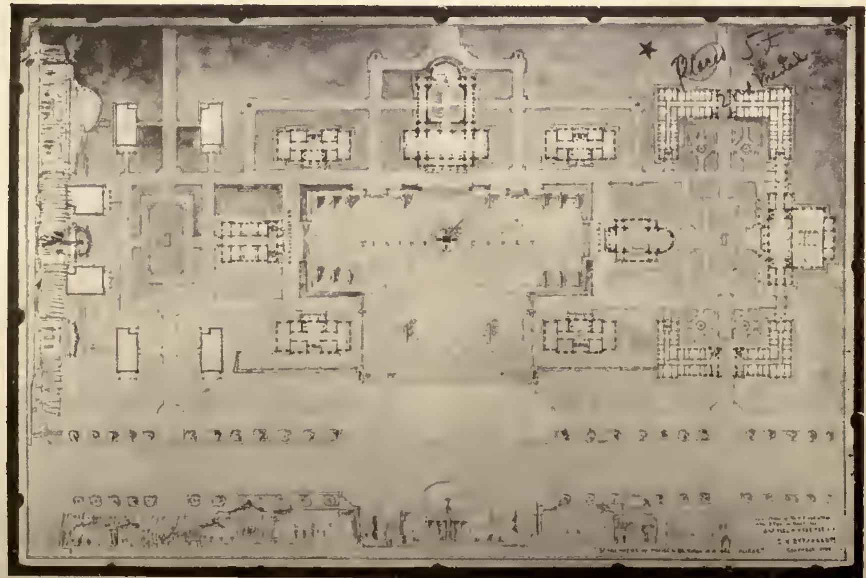
STUDENT WORK, BEAUX-ARTS SOCIETY OF ARCHITECTS




R. A. Fisher — Placed 3rd—Second Medal — Carnegie Institute of Technology



J. G. Schuhmann, Jr., — Placed 4th—Second Medal — Columbia University



E. W. Burkhardt — Placed 5th—Second Medal — Columbia University

# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## ARCHITECTURAL ACOUSTICS—III

### The Nature and Reduction of Office Noises

BY PAUL E. SABINE*

As illustrative of the general procedure the comparison of the cloth covered felt with bare felt will be worked out in detail. The cloth covered sample tested was a panel 2.43 x .95 meters, with an area of 2.30 square

Fig. 8. Acoustical Treatment installed in the new Federal Reserve Bank of Boston
R. Clipston Sturgis, Architect

meters. Hair felt, 1 inch thick was used. Over this and at a distance of ¾ of an inch, was stretched a covering of unbleached muslin, weighing four ounces to the yard. With the panel in the room, the time of reverberation was determined as the average of fifty observations, to be 5.14 seconds. When the panel was removed, the time was 6.43 seconds. In Table 1, the absorbing power of the empty room for the downstroke of the telegraph sounder is given as 8.58. By equation (6)

$$8.58 \times 6.43 = a' \times 5.14,$$

from which, $a'$, the absorbing power of the room with the panel, is 10.72.

$$a' - a = 2.14,$$

the absorbing power of the panel in terms of the unit square meter of uncovered felt. From the curve of Fig. 3, the absorbing efficiency of uncovered felt when used in units of 2.3 square meters is found to be 83% as great as is that of a single square meter. Hence a test panel of the latter

* *Riverbank Laboratories, Geneva, Ill.*

material is equal to 1.91 of our single square meter unit. The absorbing efficiency of the covered felt is, therefore 1.12 times as great as that of bare felt for the sound produced by the downstroke of the sounder.

In Tables 2, 3 and 4, are presented the results of tests conducted in a similar manner upon the relative efficiencies of the surfaces there described. The third column gives the absorptive power of the area tested, expressed in terms of one square meter of uncovered felt. The fourth column gives the absorptive power of the same area of uncovered felt as determined from the curve of Fig. 6. The fifth column gives the relative efficiency of the surface in question to that of bare felt when the two are employed in equal areas.

TABLE 2

| No. | Source | Absorbing Power | Absorbing Power, Same Area, Bare Felt | Relative Efficiency |
|---|---|---|---|---|
| 1. | Upstroke, Sounder | 2.28 | 1.91 | 1.19 |
| 2. | Downstroke " | 2.14 | " | 1.12 |
| 4. | Typewriter B | 2.26 | " | 1.18 |
| 5. | Typewriter C | 1.94 | " | 1.02 |
| | | | | 1.13 Ave. |

Hair Felt, 1″ thick, covered with unbleached muslin, weighing 4 oz. to the yard, ¾″ air space. Test Area 2.30 square meters.

TABLE 3

| No. | Source | Absorbing Power | Absorbing Power, Same Area, Bare Felt | Relative Efficiency |
|---|---|---|---|---|
| 2. | Downstroke, Sounder | 2.25 | 3.12 | .80 |
| 3. | Typewriter A | 2.62 | " | .84 |
| 4. | Typewriter B | 2.63 | " | .84 |
| 5. | Typewriter C | 2.30 | " | .74 |
| | | | | .81 Ave. |

Sound-absorbing tile, 1″ thick, laid on 4″ hollow tile, Test Area, 4.46 square meters.

TABLE 4

| No. | Source | Absorbing Power | Absorbing Power, Same Area, Bare Felt | Relative Efficiency |
|---|---|---|---|---|
| 1. | Upstroke, Sounder | 2.08 | 3.12 | .67 |
| 2. | Downstroke " | 2.24 | " | .72 |
| 3. | Typewriter A | 1.99 | " | .64 |
| 5. | Typewriter B | 1.95 | " | .62 |
| | | | | .66 Ave. |

Sound-absorbing plaster, two coats, 5/8″ total thickness, applied directly to 4″ hollow tile. Test Area, 4.46 square meters.

As is to be expected, the efficiencies of any one material are somewhat different for the different sounds, yet the difference is not great, and the average values given in the tables may be taken as a measure of the efficiencies of these surfaces in the reduction of machine noises in offices.

The renewal of these surfaces is a matter of great practical importance. Painting tends to fill the surface pores, upon which the sound absorbing properties depend in large measure. Tests were made to determine the loss of efficiency produced by painting. Table 5 shows the effect of paint upon the absorption of the sound of the downstroke of the telegraph sounder by the tile and by the cloth covered felt. In the case of the latter, as has been stated, absorption is due to the porosity of the fabric and the felt as well as to their inelastic yielding under the alternating pressure of the sound wave. Insofar as the paint renders the fabric impervious, it reduces the absorption due to porosity, replacing the porous surface through which the motion of the air particles is freely transmitted to the highly absorbent felt beneath, by a heavier membrane, less yielding, and consequently more highly reflecting. The advantage of spraying, over the application in the ordinary way is strikingly shown in the figures for the tile. The smaller reduction in absorption produced by the special fabric coating over that produced by the cold water paint is to be ascribed to the smaller extent to which the former fills the meshes of the cloth. This is due to the fact that the body of the special coating was a very light material, and to the volatile nature of the solution in which it is suspended.

TABLE 5

| Material | Treatment | Relative Efficiency |
|---|---|---|
| Sound absorbing Tile | —Unpainted | .80 |
| " | —Cold water paint, sprayed with air-brush | .60 |
| " | —Cold water paint, two coats applied with brush | .24 |
| Muslin covered Felt | —Unpainted | 1.12 |
| " | —Painted with special fabric coating, one coat | .70 |
| " | —Painted with cold water paint, one coat | .45 |

Experiments have shown that oil paints reduce the sound absorbing efficiency even more than does the water paint. It may be noted in passing, that the acoustical effects of painting, in general, are a question of the physical characteristics of the unpainted and the painted surfaces. Professor

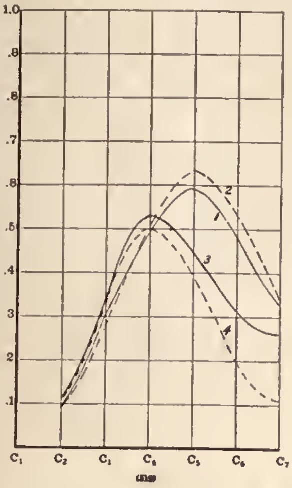


Fig. 9. Absorption Coefficients of, (1) uncovered felt; (2) the same, covered with unbleached muslin; (3) the same, muslin painted with special fabric coating; (4) the same, muslin painted with cold water paint. Area tested, 4.46 square meters

Sabine has shown that two coats of oil paint decrease in a marked degree the absorption of musical tones by a brick wall. In this Laboratory, the walls of the Sound Chamber, originally of hard gypsum plaster with a "putty finish" were painted with a priming coat of flat paint and a finish coat of enamel paint. The effect on the time of reverberation was practically negligible. Speaking generally, it is quite safe to say that, for the range of pitch that is important in music and speech, painting will produce no *increase* in absorption sufficiently great to be of practical importance in improving the acoustic properties of a highly reverberant room. In the case of surfaces which are originally somewhat porous, it may produce an appreciable *decrease* in their sound absorbing merits.

## Comparative Absorption of Pure Tones and Metallic Sounds

A comparison of the results just presented with the absorption co-efficients of these same materials for sustained tones leads to some interesting conclusions. In Fig. 9 is shown the absorbing power per square meter for tones from 128 to 4096 vibrations per second of the bare felt and of felt with the coverings described. As has been already pointed out the values obtained by the Reverberation Method, will depend upon the area, and, to a less degree upon the shape of the absorbing surfaces upon which the tests are conducted. The values here given are for surfaces, 1.83 x 2.44 meters, these being the dimensions of the plaster and tile walls tested. In Fig. 10 the co-efficients for the acoustical tile are given, and the effect upon the porous surface of this material produced by painting in the manner indicated. In Fig. 11, the upper curve gives the co-efficients for a particular sample of the sound absorbing plaster. For the sake of comparison, the lower curve for lime plaster upon metal lath is added.*

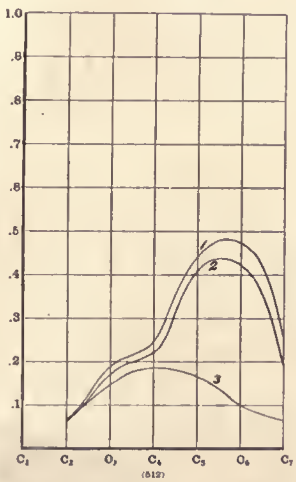


Fig. 10. Effect of painting on the absorption coefficients of acoustical tile. (1) unpainted; (2) painted with light coat of cold water paint, applied with spray; (3) painted with two coats of the same, applied with brush. Test area, 4.46 square meters

The point of chief interest brought out by comparing the values presented for pure tones, with the comparative values obtained for the metallic clicks of typewriters and the like, is the fact that, considered from the standpoint of their absorption by these materials, the metallic sounds behave like pure tones of high pitch. If the co-efficient of any one of the surfaces for a pure tone be divided by the corresponding co-efficient of uncovered felt, the ratio is the efficiency of the surface in question in terms of the felt. Carrying out this calculation, it appears that in every case, the relative efficiency for the impulsive sounds, agrees very closely with the relative efficiency of the same surface for pure tones lying in the range between $C_5$ (*1024*) and $C_6$ (*2048* vibrations per second).

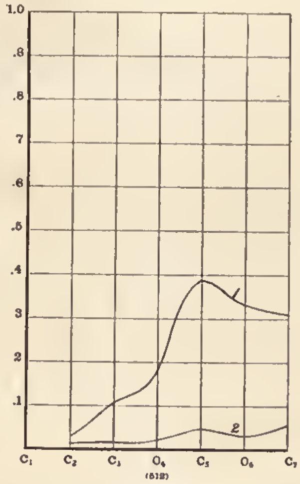


Fig. 11. Absorption Coefficients of plaster. Upper curve is for two coats of acoustical plaster, approximately ⅝-in. thick, applied to hollow tile. Lower curve is for lime plaster on metal lath

This points to the important conclusion that the most effective treatment for the reduction of the noises here considered is that having a maximum absorption for the range of pure tones just given, whereas, for the reduction of the reverberation of speech sounds, the octave below this, namely $C_4$ to $C_5$, is the most important range.

Numerous other questions suggest themselves. The effect of thickness of the absorbing material upon its efficiency is of importance. The closeness of the texture of the covering membrane, as well as the thickness of the air space between the felt and the covering are points worthy of study. Some of these have been experimentally studied, but the limits of the present paper will not permit their consideration.

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* *See "Collected Papers on Acoustics," page 204, by Wallace C. Sabine.*

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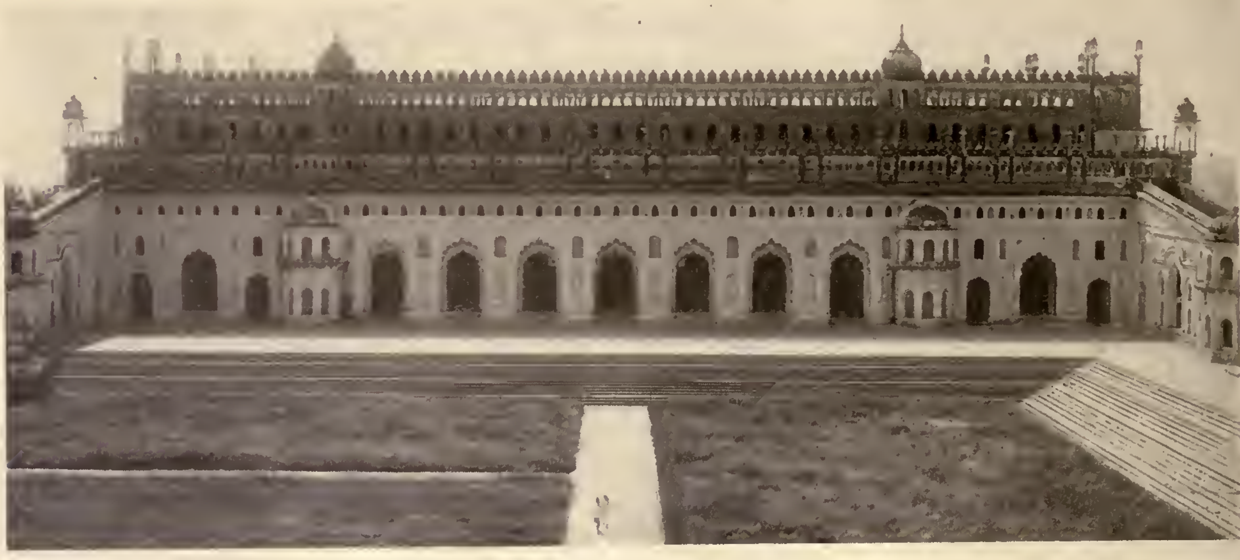
*NOTE—This is the last of a series of three articles, the first of which appeared in the issue of May 24.*

# MOSQUE ASAF-UD-DAULA IMAMBARA AT LUCKNOW

An item at present going the rounds of newspapers and popular periodicals, mentions an old mosque at Lucknow, India, built in 1780, the mosque being described as "a solid concrete building containing the largest known room without columns." The room in question must have held the honor conferred on it for many years, but modern constructors have deprived it of its unique distinction. Through the courtesy of Mr. Alexander W. Weddell, American Consul General at Calcutta, we have obtained a description of this famous building, as well as the photograph used in our illustration.



Mosque Asaf-ud-Daula Imambara at Lucknow, India

A letter dated November 7, 1921, written by the District Engineer at Lucknow and addressed to the Executive Engineer, Lucknow Provincial Division, contains the statement that after considerable investigation and inquiry made among old masons and other elderly citizens of the town, he learned that the mortar probably contains the following ingredients:

1. Shell lime (seep ka chuna).
2. Vetch flour (Mash ka Ata).
3. Raw sugar (Gur).
4. Wood apple (Bael Giri).
5. Plant Fenugreek, dried and powdered (Methi).
6. Cannabia Sativa (Hemp Sanni).
7. Pazawa Ash (Pazawah ki Rakh).

The District Engineer was informed that no stone lime was used in the mixture. The exact proportions of the various ingredients are not known.

In Mr. Weddell's description he refers to Fergusson's "History of India and Eastern Architecture," Volume II, pages 328-29.

Fergusson says the principal apartment is 162 feet long and 53 feet 6 inches wide. On the two sides are verandas respectively 26 feet 6 inches and 37 feet 3 inches wide and at each end an octagonal apartment 53 feet in diameter. He then becomes inaccurate in his description. From old records Mr. Weddell found that Asaf-ud-Daula moved the capital of Oudh to Lucknow in 1780, owing to family quarrels.

In 1782 he issued a proclamation offering 100,000 rupees for the best design for an Imambara (public praying place). One Karim Ullah, an unknown man, put forward this design and obtained the reward. As Fergusson rightly remarks, it is conceived on so grand a scale as to entitle it to rank with the buildings of an earlier age. It was built by Asaf-ud-Daula in 1784 to provide work for the starving populace during a famine.

The design is a daring bit of engineering, undertaken largely in blind ignorance of the possible dangers. The thick walls were built of lakauri brick, 6 in. by 4 in. by ½ in., laid up in the mortar previously described. The roof is elliptical but of such a flat curve as to be practically flat. It is composed of the thin lakauri brick laid up in mortar but no attempt was made to incorporate any bond in the work so the roof slab is always spoken of as being made of concrete.

The room was first filled up completely with mud and the concrete laid over it in a slab about $3\frac{1}{2}$ feet thick. After a period of twelve months, the mud was dug out and the roof remained intact up to date except for a few surface cracks.

Aside from the interesting information obtained by the District Engineer, the secret of the shell lime has perished; but this lime together with ash approximates very closely to the famous Roman lime, and is harder now than the bricks set in it.

On the top of the roof is an elaborate maze of narrow passages. Near the roof runs a gallery to hold the ladies of the Court during big prayer meetings and the only entrance to this gallery is through the maze.

One entrance only has therefore to be guarded to prevent any unauthorized person from having access to the ladies' gallery. The fate of any unauthorized person entering by chance and being lost in the maze is sealed long before he finds his way to the gallery and violates the sancity of the Harem.

The design of the building is unique, as apart from its engineering details it conforms with remarkable exactitude to the conditions laid down in the Koran concerning the disposal of the remains of Kings.

The sepulchre is below in a vault in the exact center of the building and the orientation and depth of the vault are exact. The building is sacred and investigations of these details have probably never been made. The remains of Asaf-ud-Daula repose in a sealed chamber. His tomb is indicated on the floor of the main room and is a place venerated by thousands.

# LIFE OF BURIED STEEL FUEL OIL TANKS

AN investigation recently carried out by The Factory Mutual Laboratories regarding the life of buried fuel oil tanks indicates that underground storage, decidedly advantageous from a fire prevention standpoint, need not seriously impair the condition of steel tanks, according to the April, 1922, *Quarterly of the National Fire Protection Association.*

The investigation covered the study of tanks which had been in service from 18 months to 26 years and were buried from 10 inches to 9 feet below ground level. The soils were of sand, gravel, loam, clay or cinders or mixtures of these. In some cases ground water was present and in a few cases salt tidewater. The tanks varied in capacity from 1,100 to 22,000 gallons. In a few instances the tanks were entirely uncovered in making the investigation, while in other cases a section only was exposed. This section included one side to the center line and one end to same point. The character of corrosion, condition and thickness of shell were noted, and in a few cases the scale was examined for analysis. The results of the investigation are given in the accompanying table.

The electrolytic theory of corrosion is the most acceptable one. This assumes that before iron can oxidize it must pass into solution, liberating hydrogen. Corrosion is therefore stimulated by moisture, weak acids, and oxygen. Consequently steel tanks should be buried so as to eliminate these conditions as far as possible.

The conclusion from this investigation may be briefly summarized as follows:

*Fill.* Cinders stimulate corrosion probably because of the electrolytic action between the steel and the carbon in the cinders. Loam is a better type of fill than cinders although it may stimulate corrosion because its absorptive power furnishes the essentials of corrosion: oxygen and moisture. Clay is better than loam for filling. It is generally damp and delays corrosion because it holds the water in a stagnant condition. Sand is the best filler and acting as a filter prevents many surface impurities from reaching the tank. Oily sand gives the best protection. Gravel is not quite as good as sand.

*Protective Coating.* Red lead when used alone sometimes allows contact between metal and corroding medium as film may be easily punctured. Asphalt when used alone may also permit contact. Red lead followed by asphalt gives good results. All tanks reported in excellent condition were protected by read lead, asphalt or both. No tanks examined were entirely encased in concrete. It is reasonable to suppose that concrete would offer a good protection.

*Tidewater and Ground Water.* Tidewater and ground water do not stimulate corrosion to any great extent. Salt water usually forms a hard encrustation. Ground water acts similarly but may stimulate corrosion when the oxygen content is great.

*Depth of Bury.* If a tank is buried below the zone of active oxygen it is usually below the zone of corrosion. As the depth of bury increases the tendency to corrode decreases.

*Stray Electrical Currents.* Stray electrical currents stimulate corrosion but these are not frequent.

*General.* Steel tanks buried under favorable conditions should last more than 30 years. In damp ground they will last from 15 to 20 years. To resist corrosion best, steel tanks should be coated with red lead and asphalt buried in clean sand three feet deep or more below surface, avoiding ground water and tidewater if possible.

LIFE OF BURIED STEEL FUEL OIL TANKS

| Age in yrs. | Depth of top below ground | Protection and condition | Character of soil surrounding tank; and location. |
|---|---|---|---|
| 1½ | 2 ft. | Red lead & asphalt Excellent | Salt marsh lower half, fill above. Everett, Mass. |
| 7<br>10 | 2 ft.<br>2 ft. | Red lead<br>Excellent | Clay, sand, trace of cinders. So. Boston, Mass. |
| 7 | 5 ft. | Probably asphalt Fair | Clay, sand and cinders. Salt tidewater, New Bedford, Mass. |
| 7 | 7 ft. | Red lead & asphalt Excellent | Sand and gravel, ground water. Waterbury, Conn. |
| 8 | 3 ft. | Asphalt—Good | Sand, loam and gravel. Lowell, Mass. |
| 9 | 2 ft. | Probably asphalt Good | Sand, gravel and cinders. Worcester, Mass. |
| 9 | 3 ft. | Asphalt—Fair | Sand, gravel, loam, cinders, Waltham, Mass. |
| 10 | 4 ft. | Probably asphalt Good | Sand, loam, trace of cinders. Waterville, Conn. |
| 11 | 7 ft. | Thick coat asphalt Excellent | Sand, gravel, few cinders. Waterbury, Conn. |
| 11 | 4 ft. | Asphalt—Good | Clay and sand. So. Auburn, R. I. |
| 12 | 5 ft. | Asphalt—Excellent | Oil-saturated sand. Salt tide water. New Bedford, Mass. |
| 12 | 8 ft. | Concrete—Good | Encased in concrete except at manhole, ground water, Taunton, Mass. |
| 13 | 2 ft. | Red lead asphalt Excellent | Sand and loam. Waterbury, Conn. |
| 13 | 2 ft. | Red lead Good | Oily saturated sand and clay, ground water. Lowell, Mass. |
| 14 | 6 ft. | Probably asphalt Poor | Sand, gravel, cinders, trace of oil, ground water and acid. Waterbury, Conn. |
| 15 | 2 ft. | Red lead Excellent | Black mud, formerly salt marsh. Ground water. Lynn, Mass. |
| 15 | 9 ft. | Red lead & asphalt Excellent | Oily sand, brackish ground water. Taunton, Mass. |
| 15 | 2 ft. | Asphalt—Excellent | Clay, sand, trace of cinders. So. Boston, Mass. |
| 16 | 3 ft. | Probably asphalt Good | Sand, cinders. Fitchburg, Mass. |
| 17 | 5 ft. | None—Fair | Sand, gravel, cinders, Pawtucket, R. I. |
| 18 | 9 ft. | Red lead and tar Poor inside | Salt water, some cinders. Brooklyn, N. Y. |
| 20 | 1 ft. | Red lead Excellent | Sand and gravel. Providence, R. I. |
| 20 | 2 ft. | Asphalt Excellent | Loam, clay and cinders. Cambridge, Mass. |
| 20 | 2 ft. | Probably none Good | Clay and sand, ground water. Whitins, Mass. |
| 26 | 2 ft. | Red lead—Good | Sand and gravel. Whitins, Mass. |

### Leaking Air Ducts

IN an address to the Stoker Manufacturers' Association a short time ago Mr. H. F. Hagen referred to the importance of air-tightness in ducts and related an interesting experience. In a certain plant the boiler house was laid out with four batteries of boilers, two on either side with underfeed stokers and forced-draft fans. A concrete duct ran underneath the stokers on each side of the room with a sheet metal cross-over of large area forming a connection, making the duct system resemble the letter H. Each side had three forced-draft units.

The plant operated beautifully but could not reach its designed maximum output, the complaint being, of course that the fans were not producing their guaranteed pressure. Mr. Hagen says concrete ducts are the worst enemies of fan men because it is hard to conceive of air at 6 in. or 7 in., only about four ounces to the square inch, escaping in an appreciable amount through a concrete wall six inches thick. Looking at it, however, from the standpoint of a ventilating engineer a 7 in. water column means a head in feet of 65 deg. air of 485 feet. This will give to escaping air exactly the same velocity that an equal head will give to water. This head of water would be equivalent to about 210 lbs. to the square inch and anyone building a concrete structure for water at this pressure would take the utmost precautions against leakage. With the 7 in. air pressure the question of strength does not enter, and because of this too often the leakage is disregarded.

Orders had been given that the interior of the duct be painted with six coats of black asphaltum. The painter, thinking the painting was for the purpose of protecting the metal against rust, painted only the metal cross-over and did not touch the concrete. He had been told nothing about leakage. A leakage test was run on the ducts with the result that the leakage was found to amount to 38% of the total air delivered by the fans. Painting the inside of the duct while under pressure overcame all the trouble.

### Testing Fiber Board for Strength

THE strength of paper or fiber board varies greatly according to the amount of moisture in it, says *Technical Notes,* and this amount is continually changing with the atmospheric conditions. As the relative humidity of the air increases, the strength of fiber board declines very rapidly. A piece of corrugated board tested at the Forest Products Laboratory showed a decrease in strength, by the Mullen test, of 59 per cent. when the relative humidity was raised from 65 to 67 per cent.

When fiber boards were subjected to a low, then to a high humidity, and later tested at the low humidity, the results were practically identical with those obtained before the increase in moisture. This proves that the boards had not been injured by the change in humidity, and that variations in the strength of the boards at different humidities are entirely due to a change in moisture content.

The experimental work shows conclusively that when fiber board is bought and sold on strength specifications, the humidity at which the board is to be tested must be stated.

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### Determining Penetration of Wood Preservatives

THE effectiveness of any wood preservation treatment is measured very largely by the depth to which the preservative penetrates. This can be determined by the following tests, which are used by the Forest Products Laboratory.

The presence of creosote oil is indicated by the dark discoloration, and the degree of penetration may readily be determined by taking a sample at a point free from checks and other imperfections and at a considerable distance from the end. This may be done either with an ordinary ½-inch bit, or with an increment borer, which brings out a core of wood that shows in cross section the depth of penetration and is easily examined. The observation should be made at once, because the oil spreads rapidly over the cut surface. In order to prevent infection, the hole in the treated piece should be tightly closed with a creosoted plug.

As zinc chloride is colorless, the depth of penetration of this preservative must be ascertained by chemical means. After cutting the stick in two or getting a sample with the increment borer, the freshly-cut surface is dipped for not to exceed 10 seconds, in a 1 per cent. solution of potassium ferrocyanide and the excess solution is removed by blotting paper. The sample is then dipped into a 1 per cent. solution of uranium acetate, and dried. The treated portions will be whiter than the natural wood, and those untreated will have a dark red or a maroon color. This method does not give very sharp contrasts on wood which is reddish in color, like red oak, but otherwise is very satisfactory and affords a permanent record.

Another method (developed by Galen Wood) consists in spraying over the freshly-cut surface a mixture of equal parts of a 1 per cent. potassium ferricyanide solution, a 1 per cent. potassium iodide solution, and a 5 per cent. solution of soluble starch. This colors the treated portion a very dark blue, but does not affect the untreated wood. Although the color fades in time, it may be brought back by spraying again.

Sodium fluoride is colorless, and no satisfactory method of showing its presence in wood has been devised.

Mercuric chloride is also colorless, but dipping the wood in a solution of hydrogen sulphide turns the treated area black.

As individual pieces may show an abnormally high or low degree of penetration, a sufficient number of tests should be made to obtain a fair average. Samples should be taken at a considerable distance from the ends of the stick, in order that they will not be affected by the heavy longitudinal penetration from the ends.

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### Portland Cement Specifications Advanced to American Standards

THE "Specifications and Tests for Portland Cement," for which the American Society for Testing Materials is sponsor, have been advanced to the full status of "American Standard" by the American Engineering Standards Committee. These specifications, which have been developed as a result of the experience of the industry through several years, were first approved by the A. E. S. C. as "Tentative American Standard" in 1919. They were reapproved in 1921 after agreements had been reached which eliminated slight differences between the Government and the commercial specifications, resulting in nationally recognized uniform specifications.

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### A Study of Wall Luminaires

By C. E. Weitz

THERE is a saying among decorators that "colors live by contrast." Though this is true of colors, it might be said that bad lighting practice is killed by contrast with the good. At least this was the effect of a display of seven panels exhibited first at the Milwaukee Fixture Market, and later at the National Electric Light Association Convention at Atlantic City.

These panel displays, shown in the accompanying picture, illustrate the use of wall brackets to produce the most pleasing effect by contrasting lighting from several types of accessories.

The first shows a burning tallow candle of our Colonial forefathers from which the present wall brackets are copied. Such a method of supporting the candle from the wall was very convenient and, since the candle flame was of low brightness, was very satisfactory.

When electricity displaced the candle, electric candle fixtures became common for decorative effect. Very often the lamps were too bright, especially when the wall was dark colored, causing the spot of light to be glaring and annoying. As shown in the third panel this brightness contrast is minimized with a light colored wall though even then the unshaded lamp appears fairly bright. The use of a parchment or diffusing glass shield with light wall coloring provides excellent diffusion of the light for a pleasing and decorative effect.

Colonial Practice | Bad Practice | Less Objectionable Practice | Excellent Practice | Harmful Practice | Good Practice | Good Practice

The fifth panel shows the use of wall brackets for general illumination throughout the room which, though quite common, is harmful practice. The use of large lamps in brackets is certain to be glaring and will prove very disagreeable if the walls are dark colored. The sixth panel shows how general illumination from wall brackets may be obtained by using a reflector large enough to conceal the lamp and of sufficient density thoroughly to diffuse the light.

Wall bracket accessories lend themselves to artistic design and, as shown in the last panel, if of good quality of glassware, pleasing illumination will result.

Fixture manufacturers' clubs have reproduced this display with a view to using it in furthering good lighting practice in the home, since the undesirable features of wall brackets are so strikingly contrasted with the decorative effect and utility possible to obtain when they are well selected and properly applied.

### Paint in Dark Places

WHITE paint in factories and shops is growing in popularity. Henry Ford is credited with having introduced the "spitters' reproach," a white spot about one foot in diameter painted on the baseboard and floor in all corners in order to shame men into ceasing to use such places for cuspidors. The idea spread until it is common practice in many communities. White corners led to white baseboards and in turn to white wainscoting. Now it is reported that in many shops all machines are being painted with white paint. The white spot in the corner was designed to inculcate habits of cleanliness and avoid possible dissemination of disease germs. The white baseboard and white wainscoting were found to have a distinct lighting value. White painted machines are said to help greatly in lighting effect and the effect in creating habits of cleanliness among the employees is marvelous. One item, entirely unlooked for, has been a reduction in bills for lubricating oil, the average tender of a white painted machine soon learning that until he had to keep his machine clean he was an oil waster. The time spent in cleaning is not the heinous crime it was a generation ago. White ceilings, light tinted walls and white machines help to create a sense of satisfaction and will go far to create pride in craftsmanship.

### The Radio As a Fire Risk

WITH 750,000 radio sets now in use in the United States and public interest growing rapidly, the National Board of Fire Underwriters, 76 William Street, New York City, is sending out warnings about the fire risk.

Outfits with outdoor atennæ bring in danger from lightning. This risk is not present with indoor atennæ. Specifications will be sent to all who are interested and send in requests to the above address.

### A Standardization Survey

AT the request of Secretary Herbert Hoover, of the Department of Commerce, the American Engineering Standards Committee will undertake at once a canvass to determine what simplification in manufactured products is most needed and most desirable. This canvass will be conducted through the engineering and technical bodies having representatives on the Committee or co-operating in its work. The survey of simplification or standardization needs and possibilities will extend into almost every industry in America.

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

THE *Architectural Review,* London, June. The article on Brangwyn's decorations in the Blue Coat School at Horsham is continued, and is illustrated profusely with photographs of the original studies and of the finished panels; and it is extremely interesting to compare the changes in composition and character as the decorations develop. Undoubtedly much of the color relation is lost in the reproduction; and this loss of relation will doubtless be more evident in the two panels of St. Peter and the Gift of Tongues, which are herein reproduced, because the original sketch is printed in color in the *Review.* There is a freedom and a realism in these decorations of Mr. Brangwyn which is striking and amusing; the types are exaggerated almost to caricature; his Jews are without question Jews, but we must confess that St. Peter looks more like a Sinn Fein orator than the extremely dignified and bearded gentleman to whom the Italian School has accustomed us. Still, they are all real people, and as the series is in a school chapel, a certain lightness of touch is not inappropriate. Many a tedious sermon will be more easily endured because of these pictures.

From "The Architectural Review," London

Study for Panel—"St. Peter and the Gift of Tongues"
Frank Brangwyn, R. A.

There are some good photographs of the sculptures from the Temple of Zeus at Olympia, which Mr. Edward Warren considers superior even to those of the Parthenon, and there are several excellent reproductions of some drawings in red chalk by Piranesi, which have recently been found, and it appears they may be preliminary sketches for some of his etchings.

There are also a number of photographs of the Wallace Scott Tailoring Institute in Cathcart, near Glasgow, a sort of glorified "sweat shop" designed by John Burnet, Son and Dick. It has always been rather a custom in trade, if not in the professions, to submerge the identity of one's son, but it seems going a bit far to deprive the junior partner entirely of his patronymic, particularly in these days of young blood to the fore, and all that sort of thing. We do it differently here, as may be attested by a sign in lower Fifth Avenue which reads Cesare and Papa. Well,

From "The Architectural Review, "London

Study for Panel—"St. Paul Entering Rome"
Frank Brangwyn, R. A.

The arrival of Paul at Rome, where the brethren "came to meet us as far as Appii forum, and The three taverns," is narrated in the last chapter (Chapter xxviii) of the Acts of the Apostles, from the fifteenth verse onwards

From "The Architectural Review," London


St. Peter and the Gift of Tongues

The artist takes his theme from the second chapter of the Acts of the Apostles, the words he quotes being from the fourteenth verse of that chapter. The realism of this panel is particularly bold and striking anyway, the Tailoring Institute is a well lighted and well built sort of a building and has a large dining hall and rooms for social and educational purposes; "and," says the article, "the influence of color on the nerves has been closely studied by the Welfare Authorities" who have selected eggshell and green as the color scheme; and "the two-color scheme is enhanced by all the workers being clothed in overalls of a green color to match the shade of the walls." This protective coloration must at times be a distinct boon to the employees, for if some one has left his or her machine for a quiet smoke or a bit of gossip, and if Mr. Wallace or Mr. Scott, undoubtedly clothed in eggshell, should suddenly enter, all that would be necessary to escape detection would be to "freeze" against the wall.

But still, green overalls and eggshells aside, isn't the idea a good one, and doesn't it suggest something that might be done here in New York?

*The Architectural Record,* May. Mr. Solon has collected a vast amount of material for his series of articles on Architectural Polychromy, the fifth number of which is now published. The frontispiece is in full color and beautifully produced, but we would like to know what authority has been found by Dr. Josef Durm for the vivid and spectacular coloring of our old friend the Erechtheion cap. The Corinthian cap in colored terra cotta exhumed at Olympia is novel, but not particularly good, either in design or in color. A colored Corinthian cap might be successful but the odds are decidedly against it. There is too much movement in the cap, too much variation; too many features. In point of fact, most Corinthian caps are too confused and messy even without color. Of course, we refer to large monumental orders in stone; smaller caps in wood or plaster have been successfully colored and it is conceivable that small terra cotta caps in color might be pleasing, but such decoration could never be monumental.

From "The Architects' Journal," London

"Torso" By Frank Dobson
From the Exhibition of the London Group at the Mansard Gallery

In the Portfolio of Current Architecture there are some interesting views of Henry Vaughn's Washington Cathedral, and a quaint little English cottage by E. S. Carpenter. Frank Chouteau Brown continues his article on Apartment Houses and shows some of the work of Andrew J. Thomas, his Jackson Heights apartment house being particularly good.

From *The Architects' Journal,* London, of May 24, we reprint something by Frank Dobson. "Small, compact, with a self-contained sweep of the arms closing about and hiding head and breasts, this Torso lives with a vehement life of indescribable charm." So says E. Holt, who writes an appreciation of it, and he also says that if he ever picks a winner he will buy it. If Mr. Holt is as good a judge of a horse as he is of sculpture he'll never buy it, which is some little consolation anyway. Also from *The Architects' Journal* of May 10, we reproduce a very original interior of St. Bride's Church, Glasgow, by H. O. Tarbolton, F.R.I.B.A. The church is very wide, the length being only one and a half times in width, and there are three rows of columns, irregularly spaced. It is an interesting solution of a difficult problem, is of genuine stone construction and yet there is little interference with the view of the congregation.

From *The Western Architect,* the May number, we take a view of a Railway Station in Helsingfors, Finland, by Eliel Saarinen; not that we care for it much ourselves, but it may give inspiration to the competitors in the next competition.

In *The Architectural Forum* for May, Charles W. Killam comments on the teaching of construction in the Ecole des Beaux-Arts as presented by Professor Edouard Arnaud in the *Journal of the Royal Institute of British Architects,* and also upon the paper by Thomas E. Collcutt, Past President R. I. B. A., published in the same number, in which Mr. Collcutt thinks that too much time is wasted in teaching construction and that more attention should be given to the artistic side, and that students, unfit for the profession, should be weeded out before the course is finished. Mr. Killam thinks that in the practice of modern architecture there is room for the practical man as well as the designer, and that it would be difficult, if not impossible, to weed out the students, etc.

It's a grave question, that of architectural education, and few there are that will agree on it. As

From "The Architectural Forum"

General View
Federal Reserve Bank, Richmond, Va.
Sill, Buckler & Fenhagen, Architects

to Mr. Killam's statement that a knowledge of construction is essential to an architect, we heartily agree; but the question is, how are you going to teach it? The average student in an architectural school is young and generally inexperienced. More often than not he has had no previous college education, nor, what is most important, has he had any college life. He gets his college life in the school, and while he is generally more in earnest than the average college student, still he is not particularly keen about the drudgery of it, and he generally regards construction as drudgery. He is enthusiastic over the design; he will work his head off on some monthly competition, but he will go to sleep in lectures on construction. The writer was once decidedly of the impression that it

From "The Architects' Journal," London

View looking towards Northwest Corner
St. Bride's Church, Glasgow
H. O. Tarbolton, F.R.I.B.A., Architect

was a waste of time to let second year men loose on a big projet for a Palace for the Reception of Sovereigns of France, when a couple of years later these same men would be making, or tracing, details for Butler's Pantries, but he is not so sure now. They do like those big projets and they do them surprisingly well, and the general knowledge

From "The Western Architect"

Detail of Tower, Railway Station, Helsingfors, Finland
Eliel Saarinen, Architect

of plan and design they acquire is of real value; and of particular value is the stimulus to the imagination. No one can stimulate his imagination in a Butler's Pantry. But it is also true they must have construction. How can a man design unless he knows what he is doing? To our way of thinking no one can call himself an architect if he can't design the building, make the working drawings, do, or at least superintend, the construction, write the specifications and superintend the work. It's a big order and no one man can probably do each part as well as a specialist, except as far as the design goes, for we presuppose that the architect is himself the designer. There are, it is true, some who call themselves architects, who practice only vicariously as it were; they get the commissions, perhaps, and hire competent men to do the work; such men are only middle men; they are not architects.

But to get back to the point, how are you going to teach construction? How would it be to let the designer do it? Not, of course, an inexperienced man, but some practicing architect who had had real practical experience both in design and the construction of the designs. If the proper man could be found, and there are many such, if they could only give a little time to it; if the proper man could be secured he could explain construction in a way that would command respect. The student would pay attention to what he said because he could explain that construction was design and that you had to design your construction. Of course his teaching would be general and perhaps only fundamental, but when once the student's interest was aroused he would naturally go deeper into the subject, under more expert instruction. It's worth trying.

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# NIGHTMARES*

NIGHTMARES, however dramatic and picturesque they may seem when related, are usually attributed to a prosaic cause—the failure of the digestive organs properly to assimilate food; and it is even stated that "The Mysteries of Udolpho," a weird and fantastic romance, was written under the stimulation of a diet of raw meat. We may possibly put down many imaginative results in life to indigestion inadvertently or intentionally produced. Now, even, the work of architects is occasionally a nightmare, in which case we may assume that it arises from the architect's or client's inability to assimilate some mental or artistic food. Like the author of "Erewhon," we are inclined to dogmatize, and to believe that what are considered as architectural crimes are but the manifestations of disease. In the same manner that perfect bodily digestion and perfect bodily health are practically synonymous, may not perfect design be the result of the architect's and client's digestion of architectural sustenance rather than of more complex and less easily understood processes? And if this be correct should not the architectural student consult a mental specialist to find out what food he can best assimilate, whether it should be Tudor, neo-Grec, or Baroque, and how often and in what quantity it should be taken? The parallel problem of the architect's client is more complicated, and may require longer and more careful treatment.

Now the medical student does not—like his comrade in the world of art—concentrate his attention on the contemplation of perfection, but, leaving that to the sculptor and painter, dwells on the problem of disease, and among his greatest joys is the investigation of the worst afflictions to which humanity is prone. May it not be argued that the architectural student should follow a similar course, and might he not gain more from a close study of architectural disease than he does from living in the hallowed atmosphere of the greatest monuments of history? If this be so, there is this obvious advantage: that such a study is always possible, for in an imperfect world there is more disease than health, and few buildings could obtain a clean bill of health at an architectural quarantine station. There is, to use a metaphor, many a Piccadilly Circus but only one Parthenon. The former, like the poor, is always with us; the other is far to seek. If the suggestion we make is a good one the best training for the architectural student may be found in the offices of the mediocre rather than the distinguished architect, and, as it is sometimes urged that there are more mediocre men than men of distinction, there will be no lack of opportunity, and those well versed in the forms of architectural disease will best be able to avoid its manifest dangers.

There is a possible danger that we may push our treatment too far, just as the rival medical experts portrayed by Bernard Shaw in the "Doctor's Dilemma" did, and in such a case we might fail to fill the rôle which has been occupied by the greatest men of our calling in the past.

If we are philanthropists—and almost every architect may be so described—we shall naturally think more of the public good than of our personal gratification. For this reason we strive to do good

* *An editorial in The Architect, London.*

work, and when our work does not reach a high standard it must be because we have allowed our sympathy and wish to serve our clients to obscure our higher aims.

Thus our work can be divided into two categories—good work, for which we alone are responsible, and indifferent, poor, or bad design, which is the outcome of our wish to please our clients, and which we have carried out because of our kindly sympathy. From this it clearly follows that our system of architectural education is conducted on wrong lines, and that what is really required is that education of the public to which we sometimes allude in our meetings. We do not suggest that the public should be forced to join the Institute, but simply that everyone in the land should receive some architectural training and should commit to memory some creed defining an architect's nature and functions. We can imagine the pleasure of living in a world in which a railway porter would be able to discuss the Five Orders with us in the interval of waiting for a train, when no errand boy would consent to pass through a badly proportioned doorway, and no servant would light a fire in an indifferently designed grate.

But we have mentioned the architect's nightmare as distinct from architectural nightmares. The architect's nightmares are many, but we may refer to a few of them. There is the client who does not know much about building but who has friends who do, to whom he goes for suggestions—and, unfortunately, gets them! Were these suggestions made to the architect direct he could in most cases dispose of them; but his client becomes an intermediary, carrying back his defence or explanation in a garbled form to a judge who is prejudiced against him. The client often begins to feel that if he knew more about the game he could himself catch the architect out. Strained relations, inconsistent with lofty ideals of charity, supervene—and we have a case of architect's nightmare.

We have the client who, like the ancient Athenians, is always looking out for some new thing. His architect can do nothing without discussing the advantage of something he has not thought of adopting and is usually unsuitable and inappropriate. Yet, because the client and not the architect has mentioned it first, the client feels he has got his architect at a disadvantage, and the poor fellow is much in the position of a man who runs for a train with insufficient time and failing wind. This is another well-known form of nightmare.

The economical client is often a trial and discipline to those whom he employs. His architect can do nothing without being told of something somewhere else which was cheaper, and a continual stream of such reminders gradually destroys the architect's peace of mind, leaving him in the position of a convicted fool—an experience akin to a nightmare.

The architect who builds for a client whose finances cannot well bear the strain naturally fares badly. He is placed in the position of a man who insists on his solicitor fighting a weak case. If by a miracle he wins, his judgment is justified; if not, it is human to attribute his failure to inefficient professional advice.

These and many other forms of nightmare might be described, but it suffices to say that one and all of them are obviously attributable to the client's failure to digest and understand the true nature of the sympathetic and altruistic architect he has employed.

Summing up the evidence we have briefly marshalled, we may say that architectural nightmares such as we see around us owe their origin not so much to the failure of architects, but to their super-abundant sympathy for their clients, while the architect's nightmares have their origin in the failure of the client rightly to understand and estimate the full merits of the profession.

The treatment in both cases is obviously not to administer remedies to the architect, but to the general public. We are refining pure gold at our numerous architectural schools, while what is needed is to leaven the mass and make the public recognize the talent which is theirs to employ.

But touching the minor question of the education of the architectural student, we have indicated the nature of another aspect from which it may be approached. We may arrive at a definition of virtue and vice by studying either, and is it not possible that in all fields of thought it is sometimes well to adjust our views by considering not only what is, but also what is not? We have often been asked to give chapter and verse for a condemnation of bad design, which we have found difficult precisely because we have never troubled to analyze the nature of what displeases us, while we find it easy to explain the merits of what we consider good. As the proper study of mankind is man and not good men alone, so our proper study is building and not good building alone, and it is only mental laziness which leads us to restrict the extent of our survey. We are but the instruments on which our clients play their harmonies or strike discords, and what is needed is that the performer should receive a training which will enable him to appreciate our manifold merits. We can impersonally urge the considerations which individuals of our craft are too modest to urge, though they must be conscious of the truth.

# THE AMERICAN SPECIFICATION INSTITUTE

*Member of The American Society for Testing Materials*

19 South LaSalle Street, Chicago, Ill.



*THE Board of Governors represent memberships in the following national societies: American Institute of Architects; American Society of Civil Engineers; American Society of Mechanical Engineers; American Institute of Electrical Engineers; American Society for Testing Materials; American Concrete Institute; American Iron and Steel Electrical Engineers; which indicates the scope of activities of The American Specification Institute.*

The American Architect and the Architectural Review *has gratuitously set apart this section for use by The American Specification Institute. The Editors and Publishers assume no responsibility for any statements made, or opinions expressed.*

*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review.

SPECIFICATIONS may be divided into four classes insofar as their contents are concerned. These classes are materials, methods, construction and equipment. Many specifications and, in fact, most specifications that are used in building and engineering structures, combine three of these four elements, that is to say, for building and engineering structures the specifications will embrace materials, methods and construction while for the equipment there will be these same elements with a sub-element of installation after shop construction.

Specifications are essential to the proper and orderly conduct of the business of all those concerned with buildings, engineering strutures of all classes and for all manner of equipment of whatever kind which may be placed in or about such works. We have, then, the following classification of users of specifications: Engineers, architects, contractors, manufacturers, vendors, labor, owners, buyers, operators.

Each one of these classes is vitally interested in having at its disposal good specifications, the intent and purpose of which cannot be questioned. To each of them a good specification brings the assuranee that there will be smooth operation and cordial relations for all concerned, whereas mediocre specifications mean everything but cordiality and happiness.

Owing to a present lack of means for collecting and distributing information concerning specifications there is a needless duplication of study, research and labor on the part of specification writers. This condition tends to make the work seem arduous, as it is quite often, if there has been no effort expended toward meeting the conditions present in the individual office. Those specification writers who have had sufficient vision to analyze the problem that they must meet and who have attempted to organize their work in some more or less methodical fashion, have been gratified to find the time so spent has been well spent.

Practically all other professions are so organized that the interchange of knowledge peculiar to their profession, such as the deliberations of committees which formulate proposed standards for basic operations and the results of researches undertaken by scientific laboratories, is effected in such a way as to result in the improvement of the quality of specifications produced and as a direct consequence, has resulted in an improvement in the professional and business standing of their authors.

The American Specification Institute has been organized to improve all those conditions surrounding the writing of specifications and to bring to specification writers the benefits that are to be obtained from organized efforts of men accustomed to study and write these essential documents.

The kinds of specifications that are to be studied and for the preparation of which informative data is to be compiled and distributed to members, include those for buildings, engineering structures and all works whatsoever in which materials of construction and labor are used; those for the installation and use of mechanical, electrical and sanitary apparatus and equipment; those for the fabrication and installation of all furnishings and furniture; those for all exterior and interior ornaments and ornamentation; those for road paving, planting, embellishing and improving of landscapes, estates and waterways; and those for all miscellaneous matters and things that are produced and offered for sale under specifications written by the engineer or architect.

These activities will be of interest to all those architects and engineers who are striving for perfection in their "instruments of service" and especially to such as have to do with the engineering or architectural features of structures, and th equipment for efficient and economical use.

The activities of the Institute are divided int two major classes, *viz*:, (a) study of materials anc methods and (b) study of the elements and the composition of specifications. It is highly desirable that one who writes specifications should know something of the production of raw materials and the methods of finishing and preparing them for use. Such knowledge is informative and possession of it undoubtedly will tend toward a more intelligent selection and use of materials, thus producing more economical construction. The Institute does not propose to undertake the study of raw materials—such as those that enter into the manufacture of steel, for instance—with a view to developing a specification for the manufacture of any certain basic product, but it feels that a knowledge of the physical and chemical properties is, in many cases, quite desirable in order to prevent useless or wasteful attempts to utilize a material that is unsuited for the purpose intended.

**Private Garden of the Marques de Vianna, Cordoba, Spain**

*(From the original photograph by Francis Howard)*

# SECOND JOINT CONFERENCE ON BETTER ADVERTISING TO ARCHITECTS

## Held at Chicago, June 5 and 6, prior to fifty-fifth annual convention, American Institute of Architects

On Monday and Tuesday, June 5 and 6, immediately preceding the convention of the American Institute of Architects, there was held the Second Joint Conference on Better Advertising to Architects. The representatives of some sixty manufacturers or producers of building products and a comparatively small number of architects were present.

President Kendall, in an address to the conference at the morning session, stated, that in his opinion the first Joint Conference held in Indianapolis, had accomplished much to bring about a better understanding between producers and architects, that would be helpful in solving mutual problems. He expressed the hope that the second Joint Conference would accomplish equally definite results which would be of further benefit to the profession and the building industry, and stated that the Institute was deeply interested in all such efforts. In closing, he extended a cordial invitation to all those present to attend the meetings of the Institute.

Mr. Sullivan W. Jones, Chairman of the Institute Committee on Structural Service, called the afternoon session to order and then asked Mr. Brown, architect, of Minneapolis, to take the chair.

Mr. Jones then presented the report and recommendations of the Executive Committee of the Conference. The essential feature of this report was the recommendation of the appointment of some sort of a Service Agency, such as the Structural Service Committee of the Institute, which might perform the following functions:

(a) Advise and counsel with manufacturers on the character of their advertising.

(b) Pass upon the character of advertising submitted; decide whether or not it should be filed for reference purposes; and if it contains useful data, classify it and assign a correct index number.

(c) Distribute collectively for manufacturers their advertising which has been approved as to character and classified.

(d) Study the feasibility and desirability of requiring proof of advertised claims and of the use of a symbol or hall mark of reliability.

(e) Collect data not now available, but necessary to a clear understanding of the factors to be considered if a satisfactory solution of the advertising problem is to be found.

It was quite apparent from the animated discussion, which lasted for over two hours, that those present believed that, while the plan submitted might be an ideal which it would be well to strive to attain, it presented so many practical difficulties and possible pitfalls that it would not meet the approval either of the Institute or the manufacturers.

In view of the many conflicting ideas which developed during the meeting, a resolution was adopted, directing the Executive Committee to reframe the program in the light of the discussion and to prepare a resolution for presentation to the Institute.

Mr. O. C. Harn, Advertising Manager of the National Lead Company and Chairman of the Executive Committee of the Conference, reported the results of the labors of the committee at the Tuesday morning session. The preamble and resolution follow:

Whereas, The Joint Conference on Better Advertising to Architects between the Board of Directors of the American Institute of Architects and the Building Materials Producers of the United States and reported in the *Journal* of the A. I. A. of April, 1922, and the Conference in Chicago, held June 5 and 6, 1922, have demonstrated the great desirability of a better understanding among Architects and Producers as to their common interest in the characteristics, presentation and appropriate utilization of products entering into construction; be it

Resolved, By the American Institute of Architects, in 55th Annual Convention assembled, that the Structural Service Committee of the American Institute of Architects be authorized to create a Producers Section of the Structural Service Committee as a sustaining body to collaborate with the Committee in the following duties:

(a) To advise and counsel with manufacturers, who may so desire, on the character of their advertising as to size, form, and content.

(b) To assist in furthering the use, by Architects and Producers, of the Standard Construction Classification adopted by the American Institute of Architects.

(c) To promote sincerity and reliability of statement in advertising.

Apparently the discussion of the day before had thoroughly acquainted the committee with the sentiment of the conference for there was unanimous approval both by the vote and individual speakers.

It was then voted to appoint a committee to present the matter to the Board of Directors of the Institute. This committee was accordingly appointed with the following members:

O. C. Harn, National Lead Company; S. W. Jones, A. I. A.; Lyman H. Clark, General Electric Company; D. K. Boyd, A. I. A.; W. Wishmeyer, architect; Dr. Mars, National Face Brick Mfrs. Assn.; F. B. Adam, Frank Adam Electric Company; Wharton Clay, National Assn. Metal Lath Mfrs.

Mr. Harn was also asked to hold himself ready to appear before the Institute to explain any questions which might arise and Mr. Lyman H. Clark of the General Electric Company was appointed an alternate.

Adjournment was taken to await the action of the Institute and the call of the Executive Committee.

This report was favorably received and approved at the morning session of the Institute on Friday, June 9.

# THE CHICAGO TRIBUNE COMPETITION

## One Hundred Thousand Dollars in Prizes to be Awarded in Competition Held Under Auspices of The American Institute of Architects

AS announced by President Kendall at the dinner which marked the close of the convention of the A. I. A. in Chicago, the Chicago *Tribune* has, to mark its seventy-fifth anniversary, offered prizes amounting to $100,000 in a competition for a design for a new building on its property on North Michigan Avenue.

The *Tribune,* in announcing this competition, editorially states:

The competition is open to the world, and it is hoped that the winning design will enable the *Tribune* to erect one of the most beautiful buildings known to men. We realize that prize competitions are not always productive of the best in any art. Competition frequently makes an artist self-conscious. Prize stories never reveal genius and seldom high talent. Nevertheless, we have hope that the prizes now offered will be stimulants and that the results will fully justify the methods.

The development of Michigan Avenue as a majestic thoroughfare is the possible gift of the future to the city, and the *Tribune* hopes to do its part. The monumental beauty of New York is amazing to appreciative Europeans, who see what American architecture can do with the flexibility of steel.

With this wonderfully malleable material Americans can achieve with ease what the builders with stone accomplished with pain and with expense of years. We can raise a temple, a cathedral, or a great monumental building with ease and grace, with infinite effects of lace as desired, with towering height and majestic proportions.

We believe that a great age is coming to Chicago, when its natural beauty of land and water will receive affectionate and intelligent care and development from its citizens and when the desire of men who build will be to contribute to its charm, its beauty, and its impressiveness.

To promote this end the *Tribune* will give $100,000 merely to encourage the drawing of a picture which shall later give a noble building to the city, an adornment to a great thoroughfare, and a model place of production for a newspaper which has prospered in the city it would like to serve.

The competition will be conducted under the rules of the American Institute of Architects, an association whose code of ethics is a synonym in the art world for loftiness, legitimacy, and scholarship.

The competition will open August 1, 1922. It will close November 1, 1922, thus covering three months.

The accepted design will be executed irrespective of cost.

The material in which their designs shall be executed is left to the discretion of competitors.

The jury of award will be:

Chairman, Alfred Granger, A. I. A., president-elect of the Illinois chapter of the American Institute of Architects.

Col. Robert R. McCormack, co-editor of the *Tribune.*

Joseph Medill Patterson, co-editor of the *Tribune.*

Edward S. Beck, managing editor of the *Tribune.*

Holmes Onderdonk, manager of *Tribune* real estate.

Associated with the jury will be an advisory committee comprising:

Two members of the Chicago City Council.

Two members of the Chicago Plan Commission.

Two members of the North Michigan Boulevard Improvement Association.

The prize money will be distributed on the basis of this scheme of honorariums:

A prize of $50,000 will be awarded for the design selected by the jury of award.

A prize of $20,000 will be awarded for the design ranking next in the jury's selections.

A prize of $10,000 will be awarded for the design ranking third.

Ten prizes of $2,000 each will be awarded to ten architects to be especially invited to enter into this project.

The site of the proposed structure is among the most significant and inviting to be found in any of the great cities of the world.

That building will in its turn command long vistas and huge masses. It will be a colossus by day and a beacon at night.

Inquiries concerning this competition should be directed to the co-editors of the Chicago *Tribune,* Robert R. McCormack and Joseph M. Patterson.

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### Oldest Frame Building

WHAT is said to be the oldest frame building in the United States is the old Quaker meeting house at Easton, Md. Local histories place its date of erection in 1684, giving the ancient structure an age of 238 years, and it is said that William Penn attended service in the meeting house while he was trading with the Indians.

This old Quaker meeting house stands just where it was built and as it was built, without any change. An occasional replacing of the shingles on the roof and of the weather-boarding are all the repairs it has had since it was erected. Its frame inside and woodwork and some of the weather-boarding are the same as when built.

The only preservative used on the wood has been old-fashioned whitewash on the outside. Seven of the original plank seats and the woodwork inside have had no paint whatever. White oak, white pine, cypress and Southern pine from the Maryland forests were the woods used.

### Bascule Bridge Introduced in China

IT is reported that the first bascule bridge in China is to be built over the Grand Canal in Tientsin in the near future. The bridge, which will have pagoda-like towers and ornaments typical of Chinese architecture, has been designed by a Chicago bascule bridge firm, and will have a total length of 280 ft. between abutments. It consists of a vertical-overhead-counter-weight double-leaf span of 130 ft. flanked on each side by fixed spans of 75 ft. The traffic on the Grand Canal at Tientsin (or Pei Ho as it is known at this point) is very dense and the bascule type of bridge was decided upon in order to facilitate the movement of river traffic at this point.—*Journal of the Association of Chinese and American Engineers,* Peking.

### A Bill to Promote the Fine Arts

THE following notes constitute the rough draft of a bill which, when completed, will be presented to Congress by the Hon. George P. Darrow:

Seven per cent. of the total appropriation made for any public building constructed of stone or other hard material shall be spent for art, that is sculpture, mural painting, glass and mosaic or stained glass. The artists shall be chosen by the National Art Commission, and the artist selected in each case shall be a citizen of the State in which the building is to be erected. A bond of a reputable bonding company shall be required for the faithful and prompt performance of the work from each artist, amounting to 50 per cent. of the amount of the contract. For purposes of criticism, the architect of the building shall be the agent of the nation and shall select the kind of art required for the building. The subjects of the works of art in each case shall be allegorical of the events of historic importance of the locality in which the building is to be erected.

### Goshen Tory Hanging Tree Cut Down

THE historic cottonwood tree at Goshen, near Middletown, N. Y., which was used as a gallows for the execution of Claudius Smith, a Tory bandit and murderer, 143 years ago, was cut down recently owing to its unsafe condition. The tree has been protected at great expense by the village for many years.

### Municipal Improvements Convention

THE 1922 convention of the American Society for Municipal Improvements will be held in Cleveland, Ohio, October 1-6.

### Memorial Bell Presented

IMPRESSIVE ceremonies marked the recent dedication at Landricourt-Sous-Coucy, France, of the new church bell given to this war-torn village in honor of the American soldier-poet, Alan Seeger, by the Poetry Society of America through the American Committee for Devastated France.

The ceremonies concluded with the town's 200 inhabitants passing by the bell, each tapping it with the clapper.

The bell is one of thirty given to as many villages by the American committee to replace the bells taken by the Germans, all in memory of soldiers who fell near the villages so honored.

### Church Built in 1860 Sells for $110

THE Methodist Church at White Sulphur Springs, near Liberty, N. Y., built in 1860 at a cost of $2,000 as a Federal arsenal in the Civil War, was recently sold at auction for $110. The steeple toppled over in a recent storm. The congregation will build a new church.

*Park Avenue Baptist Church*
*Park Ave., New York*

*Henry C. Pelton, Allen & Collens*
*Associate Architects*

THIS church—already known as "The Little Cathedral"—is one of the best examples of pure Gothic design recently erected. The exterior is an admirable combination of Massachusetts limestone, granite and Tudor Stone Roof. The roof completes the period effect and permanent character of the edifice.

The Tudor Stone for this roof is graduated in thickness from 3/8 to 1 inch. Seventy-five per cent is in the various shades of unfading Verde Unique—a dark living green, the greenest slate mined—rough in texture with most interesting edges. The balance is of the darker shades of brown and buff. The result is a rare combination of harmoniously blending colors.

The Tudor Stone was especially quarried to obtain interesting surface texture. Complete material for the entire roof surface was delivered, accompanied by detailed working drawings and specifications prepared by our Architects Service Department. The laying of the roof was under our personal supervision.

Roofing materials, selected and used with good judgment, do not merely assist architectural effects; they create them.

**Tudor Stone Roofs**

We are issuing a new "Architectural Leaflet," which gives detailed specifications and shows various examples where Tudor Stone has been used.
Write for your copy.

**Rising and Nelson Slate Company**

Quarries & Main Office, West Pawlet, Vermont
Office of Architects' Service Department 101 Park Avenue, New York

CHICAGO PHILADELPHIA BOSTON

# BOOK NOTES

### A Treatise On Columns*

THE scientific study of column formulas commenced in 1729 and in 1757 Euler in his *"Essai sur la force des colonnes"* proved what should be the limit of the axial load on a column in order to produce deflection. From that time to about one hundred years ago a vast literature appeared in the attempt to reconcile his theory with the result of experiments. The apparent irreconciliability was finally found to be due largely to his assumption of a perfectly straight line loaded axially, something impossible to attain in experiments. Young was the first to give an analysis which took into account the effects of eccentric loading and also of initial curvature in columns. His lack of the power of lucid expression was unfortunate for the flood of mathematical disputation continued until later investigators arose who were able clearly to interpret him.

Fifteen years after the publication of the work of Young the Tredgold formula appeared (1822) and about 1840 appeared the famous Gordon formula, which some time between 1858 and 1860 was modified by Rankine. It is now believed that the Eulerian theory is correct for a long slender column not affected by imperfections, which, broadly speaking produce three distinct effects: Eccentricity of loading; Initial curvature; Reduction in the strength of material. The Rankine-Gordon formula is rational in that it recognizes that the total stress is the sum of that due to direct compression and that due to bending. It loses its rational character and becomes empirical when constants are introduced in place of the maximum co-ordinate to the load line.

It is now generally admitted that the chief sources of weakness in a column are inevitable imperfections in the material and in the process of fabrication. The real divergence between theory and practice is due to wrong estimation of the effect of these imperfections. This explains the present popularity of "straight-line" formulas and the extensive testing of full size compression members favored by present day engineers. All the foregoing is told in detail in the new work by Dr. Salmon, which contains a full discussion of column design and construction.

The author in the Preface states that he worked nine years (1906-1915) on the preparation of a thesis for the degree of D. Sc. (Engineering), the thesis being presented to the University of London and the degree obtained in 1916. In 1921 the thesis was re-arranged by omitting all the Historical section and substituting therefor a Bibliography of 16 pages in fine type of literature on column design and construction, which begins with a reference to a treatise printed in 1729 and ends with articles printed in 1920. The literature of the subject was well searched and the number of references to American articles is gratifying. Part II, Analytical, and Part III, Synthetical, have been reproduced practically as they stood in the original, except that notes have been added, where necessary, to bring the work up-to-date. In Part III, an attempt has been made to collate what has been done on the subject, the author summing up in readable form the teachings of both theory and experiment. This part terminates with a practical application and examples.

The work is mathematical as might be expected from the fact that it is a thesis presented for a degree. The appearance of the pages however is far more terrifying than the work contained in them. The calculus is used whenever it is believed to be of value but it is hardly more than the elements of that branch of mathematics and men who have retained any recollection of it will find little trouble in following the arguments. Preceding the Bibliography the author devotes six pages to definitions and mathematical symbols, which are strictly adhered to throughout. It is a book for teachers of structural engineering, for advanced students and for that numerous class of engineers who like to go to the bottom of things and are fond of the philosophical side of their work. The historical and descriptive pages are written in an interesting style.

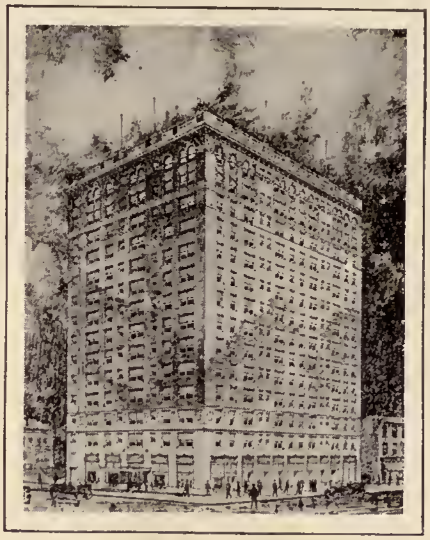
** Columns. A Treatise on the Strength and Design of Compression Members. By E. H. Salmon, D. Sc. (Eng.); Assoc. M. Inst. C. E., New York; Oxford University Press. 279 pp. Ill. 5½x9 in. Cloth.* $12.00.

### The Design of Structures*

ABOUT seventy-five years ago a Yankee schoolmaster became interested in the building of a highway bridge near his home. In conversing with the carpenter-contractor he was surprised to learn that bridges were designed by "cut and try" methods and close copying of existing safe structures. Arch action was fairly well understood and the triangle was known to make a perfect frame, but that was about all. The schoolmaster made pin-jointed models and spent his summer vacation in experimental work, the result being the birth of rational structural design. Numbers of mathematicians, checked by laboratory investigators, continued the work so that today the principles are fairly well known; the teaching of embryo structural designers having become a practically standardized process of stuffing memory cells with facts and figures.

Such a condition is not good for continuing

**Essentials in the Theory of Framed Structures. By Charles A. Ellis. 330 pp. Ill. 6 x 9 in. Cloth. New York: McGraw-Hill Book Co.* $3.50.



*The MELBOURNE HOTEL, St. Louis: Preston J. Bradshaw, Architect; 36th Street Investment Co., Builder and Owner; N. O. Nelson Mfg. Co., Jobber; J. A. McBride, Plumber*

# KOHLER

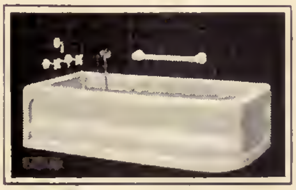
## *And* The MELBOURNE HOTEL

The community of St. Louis enjoys the fine civic pride of a thoroughly modern hostelry in the new *Melbourne.*

Every appointment of service is the very last word in comfort and convenience.

For instance, Kohler "Viceroy" Built-in Baths give the final touch of comfort and beauty to two hundred and eight bathrooms of the Melbourne.

Just another example of how hotels and clubs, apartment houses and institutions, large and small, throughout the country, are meeting the public's discriminating taste in the selection of Kohler Enameled Plumbing Ware, which is pre-eminent for durability and utility as well as for glistening, snow-white beauty.



Kohler "Viceroy" Built-in Bath
*Corner Pattern*

## KOHLER OF KOHLER

Kohler Co., *Founded 1873,* Kohler, Wisconsin
*Shipping Point,* Sheboygan, Wisconsin
BRANCHES IN PRINCIPAL CITIES

MEMBERS OF THE NATIONAL TRADE EXTENSION BUREAU

MANUFACTURERS OF ENAMELED PLUMBING WARE AND KOHLER AUTOMATIC POWER AND LIGHT 110 VOLT D. C.

development and a few teachers are advocating a return to philosophical methods of teaching. These involve progress from the particular to the general, a process paralleling the development of acquired intelligence by contact with problems of life. In the University of Illinois Mr. Charles A. Ellis gave a course in structural design in which the use of formulas was reduced to a minimum. The men in his classes were taught in a manner that developed mental power because no opportunity was given to dodge the fundamental idea or the physical conception of the problem by resorting to a formula. Mr. Ellis today is not a teacher but is vice-president of a bridge company and has written his lessons, accompanied by problems, into a textbook. It deals with subjects already well covered in many books from which it differs only in the method of presentation. For men who wish to be more than "hand-book designers" or blind followers of building code specifications it is admirable and has the additional merit of being well written. Practical men have philosophical minds and such men will enjoy studying this book for the purpose of refreshing their understanding of basic principles. It aims to teach students to think; that is, to exercise their imaginations by developing the power to reason and thus to relieve conscious dependence upon mere memory. It requires on the part of the student a working knowledge of algebra, geometry and trigonometry. The calculus is used sparingly and in the more important chapters not at all.

### Guild Scheme for France

IN response to requests by representatives of the homeless persons of the war devastated districts of France, the Executive Committee of the Union of Technicians in Industry, Commerce and Agriculture of France has decided to organize a building guild to carry out construction work for public authorities, municipalities and societies of war victims, says a report issued by the Amsterdam Bureau of the International Federation of Trade Unions. The guild is not to make any profit on its work, merely paying the regular salaries and wages to its technicians and workers. The French building trade unions are going to co-operate in the work.

### Ban Forest Advertisements

PREVENTING the national forests in California from being defaced with advertising signs, an order recently issued by the District Forester at San Francisco states that advertising signs in the seventeen national forests of California must come down. Advertisements printed on rocks and trees are also to be effaced.

According to the regulations of the Forest Service of the United States Department of Agriculture, such advertising is prohibited from all national forests without special permits, which are seldom issued.

### To Start Gorgas' Memorial

THE cornerstone for the memorial to be erected in Panama in honor of Major General William C. Gorgas, former Surgeon General of the United States Army, will be laid July 2, 1923, it was recently officially announced. The ceremony will be held in connection with the visit of the American College of Surgeons to the Isthmus of Panama on a Latin-American tour.

### Germans Are Building Upward

HAMBURG is reported to be all agog over its first skyscraper building, a sixteen-story structure to be erected in the old business district and topping the highest building in Germany by some five stories. "Himmelkratzerbau" is the way Germans speak of their skyscrapers.

### United States to Present Brazil With Statue

LARGE and small subscriptions are invited for the $100,000 fund that is to be raised in the United States for the establishment of a statue of a Goddess of Friendship in the Harbor of Rio de Janeiro as a gift from the American people to Brazil. Of the total cost, $15,000 has been pledged by the American Chamber of Commerce of Brazil, which conceived the idea.

Charles Keck, former assistant of Augustus Saint-Gaudens, was given the commission for the statue by the American Chamber of Commerce of Brazil. The towering female figure, of the same height as the Goddesss of Liberty, represents the good feeling betwen the two countries. She holds in her right hand a sprig of laurel, in her left the flags of Brazil and the United States intertwined with laurel and palm, symbolizing prosperity and peace.

The gift is to be presented to Brazil in the course of an international exposition commemorating the centennial of Brazilian independence, to be held from September 7 to December 31.

Secretary of State Hughes has approved the subscription campaign.

# PERSONALS

R. E. Scammel, architect, formerly at 412 New England Building, is now located at 614 New England Building, Topeka, Kansas.

F. J. Schwarz, architect, formerly in the Colt Building, Patterson, N. J., is now located in the Woolworth Building, New York City.

J. M. Ryder, architect, has moved his office from 16 Sean Street to the Parker Building, Schenectady, N. Y.

Edward J. Berg, architect, wishes to announce the opening of an office at 236 Genesee Street, Utica, N. Y.

Wm. Friedberg, architect, recently opened new offices at 21 Market Street, Newark, N. J., where he will be pleased to receive manufacturers' catalogs and samples.

Announcement is made that Frederick L. Barrett, formerly architect for the Sanitary District of Chicago, has opened offices at 4411 Kedzie Avenue, Chicago, Ill.

Brown, Preston & Derrick, architects and engineers, formerly at 406 Empire Building, have moved their offices to 120 Madison Avenue, Detroit, Mich.

The firm of Hughes, Horton & O'Neill, architects, 15 Central Avenue, Newark, N. J., is now known as Hughes & Horton, Mr. O'Neill no longer being associated with that firm.

John Adams, architect, Montevideo, Uruguay, has taken into partnership M. C. Broad, A. R. I. B. A. and C. S. Higgins, A. M. I. C. E., the firm to be known as Adams, Broad & Company.

M. R. Marsh, 609 Trust Building, Charlotte, N. C., has recently been granted a certificate to practice architecture in North Carolina. Manufacturers' catalogs and samples are desired.

Harry F. Cunningham, late Major, Machine Guns, U. S. Army, and at one time Director, School of Decorative Art, A. E. F. University, France, announces that he has opened an office at 1219 Connecticut Avenue, Washington, D. C., where he is prepared to undertake the study and execution of any architectural, decorating or town planning problem. Manufacturers are requested to send catalogs and samples.

Albert J. Petelinz, architect, wishes to announce the removal of his office to the Patton Building, located at 428 Grand Avenue, Milwaukee, Wis., where he will continue the general practice of architecture.

The Department of Architecture of The American Baptist Home Mission Society, 23 East Twenty-sixth Street, New York City, requests catalogs and data for an architectural library, particularly in connection with church and school work.

It is announced that Wm. B. Helmkamp, architect, formerly of the firm of Boemisch, Krans & Helmkamp, Ohio Building, Akron, Ohio, has opened his own offices at 410 Peoples Savings and Trust Building, that city.

Ralph C. Harris and Byron H. Jillson have formed a partnership for the practice of architecture, the name of the new firm being Ralph C. Harris and Byron H. Jillson, architects, State-Lake Building, 190 North State Street, Chicago, Ill.

Joseph L. Roberts, one of the oldest practicing architects in California, has established an office at 702 South Spring Street, Los Angeles. Mr. Roberts was formerly located in San Francisco and began the practice of architecture in that city in 1877.

R. L. Pringle, architect, announces that on June 1 last, Francis P. Smith, formerly Professor of Architecture at Georgia School of Technology, became associated with him for the practice of architecture under the firm name of Pringle & Smith, 1417-21 Atlanta Trust Company Building, Atlanta, Ga.

Word is received of the recent death of John Theodore Comes, architect, of Pittsburgh, Pa., the creator and chief organizer of the Pittsburgh Architectural Club. From the start of his professional career, Mr. Comes specialized in the planning and construction of churches and ecclesiastical buildings.

Elwin P. Norberg, architect, formerly at 6034 Hollywood Boulevard, has moved his offices to 704 Union Bank Building, Eighth and Hill Streets, Los Angeles, Cal. In the new location, Mr. Norberg will have as his associate Charles E. Norberg, his father, who will move his office from Pasadena.

# REFERENCE LIST OF BUSINESS LITERATURE

*A service arranged for the use of the Architect, Specification Writer, and Architectural Engineer.*

This list of the more important business literature of Manufacturers of building material and equipment is published each issue. Any of these publications may be had without charge, unless otherwise noted, by applying to The American Architect and The Architectural Review, 243 West 39th Street, New York, or obtained directly from the manufacturers. Either the titles or the numbers may be used in ordering.

**ARCHITECTURAL IRON WORK—See also Ornamental Metal Work**

**The Builders Metal Products Co.**, Cleveland, Ohio.
414. *Holt Patent Steel Stairs.* Detail drawings, specifications for and description of a strongly built, rigid steel stairway. 3 pp. Ill. 7¾ x 9 in.

**The Hughes-Keenan Company**, Mansfield, Ohio.
230. *Catalog No. 5.* Contains descriptions of pressed Steel Stairs, Ornamental Iron, Fire Escapes, Steel Door and Window Frames, Pressed Steel Toilet Partitions. 65 pp.

**ASBESTOS—See also Lumber, Roofing**

**Johns-Manville Co.**, New York, N. Y.
372. *Catalog No.* 304. A treatise on the manufacture and uses of Johns-Manville Building Materials made of asbestos and mastic for all places exposed to fire or corrosion. 100 pp. Ill. in colors. Board covers. 8½ x 11 in.

**ASBESTOS ROOFING—See also Roofing**

**The Philip Carey Co.**, Lockland, Cincinnati, Ohio.
380. *Asbestos versus Fire.* Booklet in colors. Contains information about asbestos; data on Carey Prepared and Built-up Asbestos Roofing; pictures of buildings on which they have been used. 15 pp. Ill. 6 x 9 in.

**ASH HOISTS—See also Hoists**

**Gillis & Geoghegan**, 545 West Broadway, New York, N. Y.
329. *General Catalogue.* Contains specifications in two forms, (1) using manufacturer's name, and (2) without using manufacturer's name. Detail in ¼ in. scale for each telescopic model and special material handling section. Fully illustrated with photographs of actual installations and descriptive matter of same. 20 pp., 2 colors, 8½ in. x 11 in.

**ASH RECEIVERS**

**Sharp Rotary Ash Receiver Corporation**, 396 Bridge St., Springfield, Mass.
205. *Catalogue E.* Booklet describing the Sharp Rotary Ash receiver with illustrations of houses in which the furnaces are equipped with this device. 24 pp. Ill. 6 x 9¼ in.
331. *Catalogue F.* A Booklet for architects and builders telling what the Sharp Rotary Ash Receiver is and what it does; together with tables of dimensions for installation. 8 pp. Ill. 6 x 9¼ in.

**BAKERY EQUIPMENT**

**Read Machinery Company, Inc.**, York, Pa.
275. *Three Speed Kitchen Machine.* A booklet describing a useful apparatus for mixing cake batches, fancy pastries, mashing potatoes, sieving soups, crushing fruits and vegetables and for general whipping, creaming, beating and mixing duties in hotel and restaurant kitchens.

**BOILERS**

**General Boilers Company**, Waukegan, Ill.
444. *Catalog No. 7.* A catalog completely describing the construction and operation of Pacific Steel Boilers. Contains also specifications and price lists. 32 pp. Ill. 6 x 9 in.

**BRICK**

**American Face Brick Association**, 110 South Dearborn St., Chicago, Ill.
103. *The Story of Brick.* Contains the history of, and basic requirements of building brick, artistic, sanitary and economic reasons, comparative costs, and fire safety with photographs and drawings, and illustrates ancient and modern architectural works of note in brick. Size 7 x 9¼ in. 56 pp.
137. *A Manual of Face Brick Construction.* The history of brick making, types of face brick, showing details of construction for walls, chimneys and arches. Details of use of tile and brick Construction and different types of bonds are given. A series of plans and elevations of small brick houses, descriptions, useful tables and suggestions are illustrated and described. Size 8½ x 11 in. 116 pp. Price $1.00.
155. *The Home of Beauty.* A booklet containing fifty prize designs for small brick houses submitted in national competition by architects. Texts by Aymar Embury II, Architect. Size 8 x 10 in. 72 pp. Price 50 cents.
371. *Architectural Details in Brickwork. Series One, Two and Three.* Each series consists of an indexed folder case to fit standard vertical letter file, containing between 30 and 40 half-tones in brown ink on fine quality paper. These collections are inspiring aids to all designers. Sent free to architects who apply on their office stationery; to others, 50 cents for each series.
431. *Bungalow and Small House Plans.* Four booklets containing plans for attractive small brick houses, containing 3-4, 5, 6, and 7-8 rooms. 50 pp. Ill. 8½ x 11 in. 25 cents each. $1.00 for the set.

**American Face Brick Association**, 130 North Wells St., Chicago, Illinois.
F492. *Data on Comparative Small House Costs in Chicago.* This pamphlet contains five bids from contractors on a house of 24,880 ft. cubage in the spring of 1922, together with detailed analyses and percentage costs of the various trades for five types of construction. 8 pp. Ill. 7¾ x 9 in.

**BUILDING CONSTRUCTION—See also Garage Construction**

**Concrete Engineering Co.**, Omaha, Neb.
347. *Handbook of Fireproof Construction.* An illustrated treatise on the design and construction of reinforced concrete floors with, and without suspended ceilings. The Meyer Steelform Construction is emphasized and tables are given of safe loads for ribbed concrete floors. 40 pp. Ill. 8½ x 11 in.

**Truscon Steel Company**, Youngstown, Ohio.
317. *Truscon Floortyle Construction. Form D-352.* Contains complete data and illustrations of Floretyle installations. 16 pp. Ill. 8½ x 11 in.
318. *Truscon Standard Buildings. Form D-398.* Describes Truscon Standard Steel Buildings, with diagrams, illustrations of installations, descriptive matter and list of users. 48 pp. Ill. 8½ x 11 in.
319. *Truscon Building Products. Form D-376.* Contains a brief description of each of the Truscon Products. 112 pp. Ill. 8½ x 11 in.
320. *Modern School Construction. Form D-396.* Contains illustrations of schools, with typical elevations, showing advantages of Truscon Products for this construction. 16 pp. Ill. 8½ x 11 in.

**BUILDING HARDWARE—See Hardware**

**BULLETIN BOARDS**

**R. W. Clark Mfg. Co.**, 1774 Wilson Ave., Chicago, Ill.
443. *Own Your Directory* and *Bulletin Boards of Character and Service.* Two pamphlets describing the Clark Changeable Bulletin Boards and Directories for Hotels, Club Houses, Business Blocks, etc. Each 4 pp. Ill. 6¼ x 9½ in.

**CABINETS**

**Hess Warming & Ventilating Co.**, 1204-7 Tacoma Building, Chicago, Ill.
386. *The Hess Sanitary Medicine Cabinet Lockers and Mirrors.* Description with details of an enamelled steel medicine cabinet for bathrooms. 20 pp. Ill. 4 x 6 in.

**CASEMENTS—See Doors and Windows**

**CEILINGS, METAL**

**The Edwards Manufacturing Company**, Cincinnati, O.
193. *Pamphlet* of 32 pages describing metal ceilings and wainscoting. Well illustrated, with list prices and rules for estimating. 7 x 10 in.

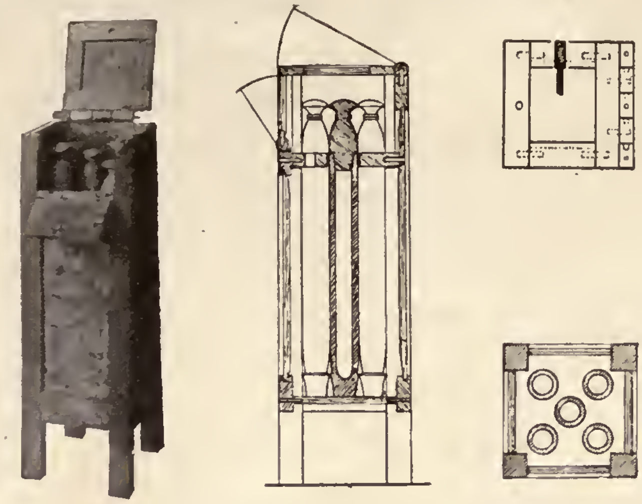
**CEMENT**

**Carney Cement Company**, Mankato, Minn.
448. *The Bond That Guarantees the Wall.* Attractive catalog for architects, engineers, contractors and dealers. Describes fully the characteristics, durability and economy of this nature-mixed cement that requires no lime. Contains simple formula for mixing and illustrations of Carney-laid buildings. 20 pp. Ill. 8½ x 11 in.

**Krider Building Material Co., Inc.**, 422 East 3rd St., New York, N. Y.
418. *Durastone Brand Cement.* A description of a cement which matches any stone or marble, any color or texture. Can be cast in molds and also used for walls or plain surfaces. Illustrations are given of beautiful work executed with this material. 12 pp. 8½ x 11 in.

**CHUTES—See also Laundry Equipment**

**Edwin A. Jackson & Bro., Inc.**, 50 Beekman St., New York.
171. Booklet showing general construction and size of chutes to receive coal. Two types are built into the foundation wall with glass panel in place of cellar window; another type is placed flush with the ground, and is placed adjacent to wall, or can be placed near the street curb. Size 3½ x 6¼ in. 16 pp.



Grecian lady's cosmetic cabinet 2300 years old (300 B. C.) now in the Berlin Museum. It once contained cold-cream, rouge and eyebrow pencils.

## MONITE WATERPROOF GLUE

is as great an improvement over the casein waterproof glue formula of the Greeks as the modern battleship is over the 300-oared war-galley of ancient Greece.

# The Greeks Used This Glue 2500 Years Ago!

The following is translated from pp. 121-2 of "The Story of Furniture" ("Geschichte des Mobels") by A. Koeppen and C. Breuer, published at Berlin in 1904.

> "Glue was a favorite fastener. There were two kinds of glue, the common kind, joiner's glue made from animal offal and fish bladders * * * and also the glue made from caustic lime and white of egg or casein, which had already been discovered by the Egyptians.
>
> "Their wish to construct rich furniture at lower cost, as well as the experience that the use of a suitable core-wood makes flat pieces warp less than when heavy boards of costly wood were used, led them to adopt ply work. This was cut with saws and fastened to an under layer of other wood with glue. Thus they made table-tops, chests, beds, etc.
>
> "How widely this work was done in the olden times, there is much existing evidence that has been found in the graves of Crimea."

Ply-work, tenon or mortise joints; marvelous inlaid work giving pictorial effects with varied woods, tortoise-shell, ivory, metals and precious stones were all made by the early Greeks with the aid of casein waterproof glue as early as 500 B. C. **2500 years ago!** Many excellent specimens of their work will remain—in European and American museums.


Monite Waterproof Glue is the modern scientifically perfected form of the casein waterproof glue used by the ancient Egyptians and Greeks. Joints and ply-wood made with MONITE are far superior to this glue-work of the Greeks which has endured 25 centuries.

**Monite Waterproof Glue produces joints and panels that are heat and waterproof,** glues wood with high or low moisture content, is mixed and applied by machinery or by hand, needs clamps for only 3 or 4 hours. It is as strong as hot glue and **costs but little more than vegetable glue.**

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# REFERENCE LIST OF BUSINESS LITERATURE—Continued

**CLOCKS**

**Landis Engineering and Manufacturing Co.**, Waynesboro, Penna.
469. *Frick Electric Time and Program System.* A collection of bulletins No. 100, 110, 120, 130, 150 and 160, dealing with master and secondary clocks, equipment, time stamps, etc. Bound in expansible filing cover of tough paper. 48 pp. Ill. 8½ x 11 in.

**COLUMNS**

**Lally Column Co., of New York,** Calyer & Russell Sts., Brooklyn, N. Y.
122. *Lally Columns. Handbook.* Detailed construction diagrams for various types of steel construction. The text describes advantages of endurance and economy of the column. Various tests, tables of sizes, dimensions, weight, capacities and price given. Size 4¾ x 6½ in. 64 pp.

**CONDUITS—See Pipe**

**CRAFTEX WALL FINISH**

**Simmons, Gardner Company,** 7 Water Street, Boston, Mass.
F493. *Specifications for Producing Craftex Wall Finishes.* A four page pamphlet of specifications which contains also a list of a few representative installations. Ask also for sample reproductions. 8½ x 11 in.

**DAMPPROOFING—See also Waterproofing**

**DECORATIVE FABRICS**

**Flambeau Shops, Inc.,** 7 East 39th St., New York, N. Y.
420. *Hand Woven Fabrics.* A four-page circular with an artistically designed cover describing the work of the Flambeau Shops, Inc. Here are woven in any combination of colors, or to any special design, fabrics to suit the decorative scheme of a client. This includes draperies, wall hangings, bed coverings, rugs, etc., all executed on hand looms.

**DOORS AND WINDOWS**

**Art Metal Construction Company,** Jamestown, N. Y.
413. *The Interior System of Architectural Hollow Metal.* A loose leaf binder containing 38 sheets of details and 12 pages of description and specification of hollow metal doors, sash and trim.

**Crittall Casement Window Company,** 2703 E. Atwater Street, Detroit, Mich.
247. *Catalog No. 18. Crittall Universal Casements.* Contains complete description of steel casement windows for banks, schools, residences, churches, hospitals, etc., with details showing construction when set direct in masonry or with auxiliary frames. Sample specification enclosed 56 pp. Ill. 9 x 12 in.

**Dahlstrom Metallic Door Co.,** Buffalo and East 2nd St., Jamestown, N. Y.
201. *Architectural Portfolio.* A collection of various designs and types of Dahlstrom Doors, drawings and details of each style or type. Mailed free only to architectural offices. 30 pp. Ill. 14 x 18 in.

**Dahlstrom Metallic Door Co.,** Buffalo and East 2nd St., Jamestown, N. Y.
202 *Architectural Catalogue.* An illustrated catalogue showing standard styles and types of Dahlstrom hollow metal doors and interior trim. Various types of frames and other architectural shapes are also illustrated. 46 pp. 11 sections. 10 x 14 in.

**Henry Hope & Sons,** 103 Park Ave., New York.
65. *Hope's Casements and Leaded Glass.* Portfolio. Gives specifications, description and photo-engraving, of Hope Casements in English and American Architecture, full size details of outward and inward opening and pivoted casements, of residential and office types. Size 12¼ x 18½ in. 32 pp.

**The Kinnear Mfg. Co.,** Columbus, Ohio.
455. *Steel Rolling and Folding Doors and Shutters. Catalog No. 52.* This catalog is devoted to service doors adaptable to buildings of all classes, piers, factories, warehouses, etc. Illustrates their use and contains tables for designers and detailers. 96 pp. Ill. 8 x 11 in.

**The Lunken Window Company,** 4022 Cherry Street, Cincinnati, Ohio.
351. *Lunken Windows.* The Lunken Window allows a full 100% opening thus obtaining for a sash window all the merits, with none of the glaring demerits, of French windows. This booklet tells how this is done. 12 pp. Ill. 4 x 9½ in.
352. *Baby Book of Details for Lunken Windows.* One for heavy construction and one for light construction. Each book contains 20 pages of line drawings of details for use of draftsmen. Convenient pocket size. 3 x 5¼ in.

**Monarch Metal Products Co.,** 5020 Penrose Street, St Louis, Mo.
438. *Casement Windows.* An interesting talk on the beauty and practical advantages of casement windows. Describes control locks, automatic stay and casement check made by this company for use on casement windows. 12 pp. Ill. 4 x 9 in.

**Morgan Woodwork Organizations,** Oshkosh, Wis.
286. *Building with Assurance.* A complete treatise on standardized doors and woodwork for houses. It contains also articles by experts on Lighting, Heating, Plumbing, Interior Decorating, etc. Profusely illustrated with many plates in color. 436 pp. Flexible leatherette covers. 9 x 11 in.

**S. H. Pomeroy Company,** 282 East 134th St., New York N. Y.
293. *Underwriters' Laboratory Fire Retardant Windows.* A valuable book containing the Underwriters' specifications for fire retardant windows; at the same time being a complete catalog of windows built to meet the specifications. 61 pp. Ill. 6¼ x 8½ in.

**Reliance Fireproof Door Co.,** West & Milton Streets & Greenpoint Ave., Brooklyn, N. Y.
269. *Reliance Fireproof Doors.* An illustrated book showing types of doors and windows, mouldings, etc., with working drawings. 44 pp. 6¼ x 9¼ in.

**Roddis Lumber & Veneer Co.,** Marshfield, Wis.
146. *Roddis Flush Veneered Doors.* An illustrated booklet of buildings in which Roddis doors have been used, and a treatise on Roddis Standard Construction, showing sections and diagrams of doors, as well as photographs of many types of inlaid veneered doors in color. Technical information relative to staining and finishing of doors. Size 6 x 9¼ in. 100 pp.

**Truscon Steel Company,** Youngstown, Ohio.
315. *Truscon Steel Sash.* A catalog containing designing data, tables and views of Stock Sash installations. 6 pp. Ill. 8½ x 11 in.
348. *Truscon Steel Sash.* This handbook has been prepared for detailers and specification writers. The descriptions are clear and the details are complete. 80 pp. Ill. 8½ x 11 in.

**The Victor Parting Bead Co.,** Reading, Pa.
423. *Through the Closed Window.* The Victor Parting Bead for preventing drafts, is rigid, durable and yet resilient. How these desirable qualities are attained and retained is told in this little book. 12 pp. Ill. 3¼ x 6¼ in.

**DRAFTING MATERIALS**

**American Lead Pencil Co.,** 220 Fifth Ave., New York, N. Y.
268. *Booklet C-20. Venus Pencil in Mechanical Drafting.* An interesting illustrated booklet showing the possibilities of the Venus Drawing Pencil for drafting. 6 x 9 in.

**Joseph Dixon Crucible Company,** Pencil Department, Jersey City, N. J.
325. *Finding Your Pencil.* A book explaining the various degrees of hardness of the Eldorado pencil and the grade most suitable for every man who uses a pencil be he business or professional man, clerk or draftsman. Accompanied by a color chart of Dixon colored crayons. 16 pp. and 4 pp. in color chart. Ill. in colors. 3¼ x 6 in.

**DRAINS—See also Plumbing Equipment**

**Brayman Water-Tight Drain Co.,** 133 West 52nd Street, New York, N. Y.
267. *Regular Catalog.* A catalog illustrating seventy-five types of water-tight drain boxes for installation in any location. 44 pp. 4½ x 9 in.

**DUMBWAITERS—See also Elevators**

**Sedgwick Machine Works,** 144 West 15th Street, New York.
60. *Hand Power Elevators and Dumbwaiters in Modern Architectural Construction.* Illustrated catalogue. 4¼ x 8¼ in. 80 pp.

**ELECTRICAL EQUIPMENT—See also Lighting**

**Frank Adam Electric Co.,** St. Louis, Mo.
296. *Catalog No. 25.* A catalog and price list of knife switches switch boards, panel boards, steel cabinets, switch board material. 83 pp. Ill. 8 x 10½ in.

**Harvey Hubbell, Inc.,** Bridgeport, Conn.
297. *Electrical Specialties. Catalog No. 17, 1921.* This catalog contains descriptions with prices of the thousand and one items connected with electric light, electrical alarm and small electrical appliance installations in modern buildings. 104 pp. Ill. 8 x 10½ in.

**National Metal Molding Co.,** Pittsburgh, Pa.
481. *Liberty Rubber Insulated Wires, Cables and Cords.* A descriptive catalog of insulated wires, cables and cords for electric wiring. Contains much special information together with useful tables. 20 pp. Ill. 6 x 9 in.

**ELEVATORS—See also Dumbwaiters and Hoists**

**Elevator Locks Co.,** 119 No. Washington St., Peoria, Ill.
338. *A Sign of Safety.* Describes devices for mechanically locking power and automatically locking gates of elevators, and control landing. Contains also list of users of this equipment. 26 pp. Ill. 4 x 9½ in.

**Kimball Brothers Company,** Council Bluffs, Iowa.
330. *Kimball Elevators.* An illustrated catalog of hand power, sidewalk, and garage elevators and dumbwaiters and electric passenger, freight and push button elevators. 32 pp. Ill. 7¾ x 10½ in.

**Otis Elevator Co.,** 260 Eleventh Ave., New York, N. Y.
261. *Electric Traction Elevators.* An illustrated catalog describing gearless traction elevators. 28 pp. 8½ x 11 in.; and an illustrated catalog describing worm gear traction elevators. 24 pp. 6 x 9 in.

From a drawing by Wesley Bonestell © ARCO 1922 Architects: Henry M. Congdon & Son, New York

TRINITY CHURCH, Waterbury, Connecticut, where two IDEAL TYPE A HEAT MACHINES are paying for themselves in the fuel they save.

# How much less in the end!

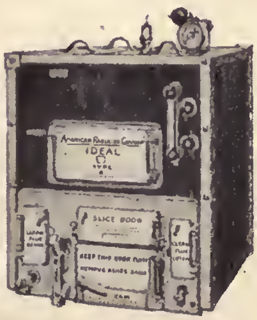
THE old-fashioned heating plant in this church burned 80 tons of coal in the winter of 1918-19.

The church committee hesitated whether to substitute IDEAL TYPE A HEAT MACHINES, or a cheaper boiler. They decided to pay a little more for the IDEAL TYPE A.

The following winter, a hard winter, 65 tons were burned.

Last winter, a mild winter, 55 tons were burned.

A saving of 40 tons in two years!



There are two kinds of heating equipment—the kind that is merely a purchase; and the kind that is a long-time investment.

The American Radiator Company is in the business of selling heating investments. Sometimes they cost a trifle more in the beginning—but how much less in the end!

TO ARCHITECTS OR ENGINEERS who have residences or buildings under way this Summer: Your name on your letterhead, sent to either address below, will bring a finely illustrated book of the IDEAL TYPE A HEAT MACHINE showing heat test charts and details of construction.

## AMERICAN RADIATOR COMPANY

*IDEAL Boilers and AMERICAN Radiators for every heating need*

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# REFERENCE LIST OF BUSINESS LITERATURE—Continued

**ELEVATORS—See also Dumbwaiters and Hoists**

**Richards-Wilcox Mfg. Co.,** Aurora, Ill.

**335.** *"Ideal" Elevator Door Equipment.* Catalog showing elevator door hangers for one, two and three speed doors, also doors in pairs and combination swing and slide doors. Door closers and checks. 24 pp. Ill. 8½ x 11 in.

**A. B. See Electric Elevator Co.,** 52 Vesey St., New York.

**169.** Photographs and description in detail of elevator equipment manufactured by the A. B. See Electric Elevator Co. Size 6 x 8 in.

**ESCALATORS**

**Otis Elevator Co.,** 260 Eleventh Ave., New York, N. Y.

**263.** *Escalators.* An illustrated catalog describing escalators, with layouts of typical installations. 36 pp. 6 x 9 in.

**FENCE**

**The Stewart Iron Works Company,** Cincinnati, Ohio.

**456.** *Book of Designs "B."* A book of fence designs full of suggestions for architects. All illustrations are from photographs. 80 pp. Ill. 9¼ x 12 in.

**FINANCING OF ENTERPRISES**

**The Hockenbury System, Incorporated,** Penn-Harris Trust Building, Harrisburg, Pa.

**313.** *Your Hospital and Its Financing.* An educational work on how to finance a new hospital project and obtain funds for needed extensions to existing institutions. Illustrations are given of six institutions in five states financed by the methods, and through the work of the Hockenbury specialists. 20 pp. Ill. 4¼ x 8½ in.

**314.** *Financing Your City's New Hotel.* A plan is here offered to the enterprising architect whereby his ideas for a new hotel for his home city may be realized. Hotels financed through the work of the Hockenbury specialists are shown, together with testimonials from local business men. 20 pp. Ill. 4¼ x 8½ in.

**S. W. Straus & Co.,** 565 Fifth Ave., New York, N. Y.

**183R.** *Forty Years Without Loss to Any Investor.* A book describing the Straus Plan of investments. This firm underwrites and sells only first mortgage serial bonds secured by newly improved income producing properties, or high grade industrial properties. 37 pp. Ill. 5 x 8 in.

**FIRE DOORS AND SHUTTERS—See Doors and Windows**

**FIREPLACES AND MANTELS**

**Chattanooga Roofing and Foundry Co.,** Chattanooga, Tenn.

**143.** *The Magic Hearth.* Leaflets. With instructions to build an open fireplace, section drawings, illustrations of fireplace equipment grates, firebacks, cranes, andirons, etc. Size 8½ x 11 in. 10 pp.

**Colonial Fireplace Company,** 4611 West Roosevelt Road, Chicago, Ill.

**479.** *Fireplace Equipment.* A catalog and price list of andirons, modern dampers, fenders, fire-sets, screens, thresholds, etc., together with valuable information about the proper construction of fireplaces. 20 pp. Ill. 8½ x 11 in.

**H. W. Covert Co.,** 137 East 46th St., New York.

**79.** *Hints on Fireplace Construction.* Diagrams of construction, and installation of Covert "Improved" and "Old Style" dampers and smoke-chambers, and other fireplace accessories. Size 5⅝ x 8½ in. 12 pp.

**Edwin A. Jackson & Bro., Inc.,** 50 Beekman St., New York.

**92.** *Dampers, Chutes, Doors and Dumps.* Illustrated catalog. Equipment and appurtenances of various types, construction and installation, data, dimensions and prices.

**106.** *Franklin Stoves.* Illustrated booklet containing plans, sections and photographs of this Colonial stove, including type heating on two floors. 12 pp. 7 x 7 in.

**FIRE PROTECTION EQUIPMENT**

**Foamite Firefoam Company,** 151 Fifth Ave., New York City.

**449.** *The Why of Portable Fire Extinguishers by Frank A. Epps, A.S.M.E., N.F.P.A.* A discussion of four types of portable fire extinguishers with quotations from reports made by the Underwriters' Laboratories. 6 pp. 4 x 8 in.

**450.** *Firefoam. What It Is and What It Does.* A description of a fire-smothering agent which blankets all burning objects; clings to all burning substances; floats on any burning liquid. 6 pp. Ill. 4 x 8 in.

**Jiffy Fire Hose Rack Co.,** 133 West 52nd St., New York, N. Y.

**266.** *Stand Pipe Equipment.* An illustrated catalog showing complete installations of stand pipe equipment. 31 pp. 7 x 9 in.

**FLOORING, SUB—See also Stucco Base**

**FLOORING**

**American Magnesia Products Co.,** 5730 Roosevelt Road, Chicago, Ill.

**285.** *Velvetile Floorings: Its uses and Application.* Describes Velvetile Magnesia Flooring and tells how it is applied, with information as to its durability. 12 pp. 4 x 9 in.

**Armstrong Cork Co., Linoleum Department,** Lancaster, Pa.

**222.** *Business Floors.* A handy reference on floors for public and semi-public buildings, containing specimen specifications, directions for laying and other helpful data. Illustrated in color. 6 x 9 in.

**Congoleum Company, Inc.,** Philadelphia, Pa.

**428.** *The Gold Seal Specification.* Contains specifications for laying Linoleum and Cork Carpet according to methods perfected after years of experiment and careful research. 2 pp. 8½ x 11 in.

**429.** *Linoleum Service Sheet, 1: No. 40.* A sheet containing detail sketches drawn to scale for applying linoleum to floors; over thresholds; on staircases; under radiators; etc. The reverse contains description of materials and complete detailed specifications for laying linoleum. 17 x 22 in., folded to 8½ x 11 in.

**The Long-Bell Lumber Co.,** R. A. Long Building, Kansas City, Mo.

**204.** *The Perfect Floor.* Tells how to lay, finish and care for Oak Flooring. 16 pp. 14 Illus. 5⅛ x 7⅝ in.

**The Marbleloid Co.,** 461 Eighth Ave., New York.

**61.** *The Universal Flooring for Modern Buildings.* Illustrated booklet. Describes uses and contains specifications for Marbleloid flooring, base, wainscoting, etc. Size 6¾ x 9¾ in. 32 pp.

**Franklin R. Muller Co.,** Waukegan, Ill.

**242.** *Asbestone Flooring Composition.* A book describing uses of and giving specifications and directions for Composition Flooring, Base, Wainscoting, etc. 8½ x 11 in. Ill.

**Republic Creosoting Co.,** Indianapolis, Ind.

**447.** *Specifications for Kreodone Interior Wood Block Floors.* Contains complete specifications for laying floors of thoroughly air-seasoned, long-leaf yellow pine blocks, thoroughly treated with pure distillate creosote oil. 4 pp. Ill. 8½ x 11 in.

**W. & J. Sloane,** Selling Agents, New York, N. Y.

**439.** *Nairn Inlaid and Printed Linoleum.* A 68-page book illustrated in colors. Shows patterns of linoleums with views of attractive interiors in which linoleum covered floors form part of the decorative scheme. 6 x 9 in.

**440.** *Nairn Samples.* A sample book of plain linoleum and one of cork carpet, each 4¾ x 8¼ in., bound in cloth. A third sample book contains samples of inlaid and printed linoleum. 3 x 6 in.

**FLOORS—See Building Construction**

**FURNACES—See Heating**

**GARAGE CONSTRUCTION—See also Building Construction**

**GARBAGE DESTROYERS**

**Kerner Incinerator Company,** 1029 Chestnut St., Milwaukee, Wis.

**384.** *The Sanitary Elimination of Household Waste. M-3 Folder.* Description of construction, installation and operation of the Kernerator for residences. Illustrated by views of residences in which the Kernerator is installed, with cuts showing all details. 15 pp. Ill. 4 x 9 in.

**GARBAGE RECEIVERS**

**Edwin A. Jackson & Bro., Inc.,** 50 Beekman St., New York.

**170.** Booklet showing general construction and sizes of garbage receivers to be placed underground for suburban use; also types to be built into the wall of city homes and apartments; also types for suburban wall with opening on inside for the maid and outside for the garbage man. Size 3½ x 6¼ in. 16 pp.

**GARDENS**

**Julius Roehrs Company,** Rutherford, N. J.

**406.** The Ten-Ten books issued three times a year—covering nursery stock in general, such things as fruit trees, roses and perennials. Also one general greenhouse catalog, listing orchids and greenhouse plants.

**GLASS CONSTRUCTIONS**

**Frederick L. Keppler,** 1799 First Ave., New York, N. Y.

**368.** *Bulletin No. 207.* Describes Keppler Rooflights and tells why they are permanent, how to install them, etc., together with all necessary data for designers. 4 pp. Ill. 8½ x 11 in.

**GREEN HOUSES—See Glass Constructions**

**GUTTERS AND DOWNSPOUTS—See also Roofing.**

**The New Jersey Zinc Co.,** 160 Front Street, New York, N. Y.

**226.** *Zinc Spouting.* Describes leaders, gutters, etc., "Made from Horse Head Zinc," giving information concerning their economy and durability. 8 pp. Ill. 6 x 9 in.

# 76 Years Ago
# A Zinc Roof was Put on this Home

A few months ago the house was razed to make room for one of modern type. But the Zinc roof, still in perfect condition, had substantial salvage value.

Roofing equipment, such as leaders and gutters, shingles and trim, made from Horse Head Zinc lasts indefinitely.

These ten preferential features are embodied in roofing equipment made from HORSE HEAD ZINC.

1. It cannot rust.
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3. Is self-protecting.
4. Requires no paint.
5. Attractive color.
6. Blends with color schemes.
7. Does not stain light surfaces.
8. Eliminates replacement costs.
9. Least expensive durability considered.
10. Assures roof upkeep economy.

## THE NEW JERSEY ZINC COMPANY

160 Front Street (Established 1848) New York City

*Manufacturers of*

*Zinc Oxide, Albalith, Zinc Dust, Slab Zinc, Rolled Zinc, Spiegeleisen, C.P. Metallic Zinc, Zinc Sulphate, Mossy Zinc, Feathered Zinc, Sulphuric Acid, Salt Cake, Zinc Chloride*

CHICAGO: Mineral Point Zinc Company, 1111 Marquette Building
PITTSBURGH: The New Jersey Zinc Co. (of Pa.), 1439 Oliver Building
CLEVELAND: The New Jersey Zinc Sales Co., 1138 Guardian Building
SAN FRANCISCO: The New Jersey Zinc Sales Co., 1205 Merchant's Exchange Bldg.

New Jersey Zinc Co

*The world's standard for Zinc products*

# REFERENCE LIST OF BUSINESS LITERATURE—Continued

## HARDWARE

**Carrier Adjuster Company,** Asheville, N. C.
470. *Carrier Quadrant Adjuster.* A description, with specifications and detail line drawings, of an adjuster for outward opening casement windows. Locks window at any angle without interference with screens or draperies and permits cleaning of entire window from the inside. Permits 100% opening for ventilation. 4 pp. Ill. 8½ x 11 in.

**Franz Manufacturing Company,** Sterling, Ill.
350. *Complete Hardware Catalog.* A catalog of hardware for garages, stables, outside doors, windows, coal chutes, chimney caps, flues, coal holes, cisterns, etc., 128 pp. Ill. 7 x 10 in.

**The Kawneer Co.,** Niles, Mich.
142. *Kawneer, Simplex Window Fixtures.* Booklet illustrated. Drawings, photographs and text describes weightless, reversible window fixture, its ease of installation, ventilation and light control. Size 8½ x 10¾ in. 16 pp.

**Knape & Vogt Manufacturing Company,** Grand Rapids, Mich.
471. *Hardware Catalog No.* 10. A complete catalog of hardware for home closets, garment holders, show cases, cabinets, desks and furniture. 110 pp. Ill. 6 x 9 in.

**Richards-Wilcox Mfg. Co.,** Aurora, Ill.
330. *Modern Hardware for Your Home.* Catalog of hangers for vanishing French doors; "Air-Way" multifold hardware for sun parlors and sleeping porches; "Slidetite" garage door hardware. 24 pp. Ill. 8½ x 11 in.

435. *Distinctive Garage Door Hardware. Catalog No. A-*22. This is more than a catalog. It is a treatise for architects and builders on the door equipment of garages, covering sliding, folding and combination sliding and folding doors, with their hardware. 94 pp. Ill. 8½ x 11 in.

436. *Sliding Door Hardware. Catalog No. A-*17. A catalog of sliding door hardware of Parallel, Accordion and Flush Door partitions. 32 pp. Ill. 7 x 10 in.

**Sargent & Company,** New Haven, Conn.
478. *Sargent Locks and Hardware,* 1922. The latest complete catalog of locks, hardware, small tools, etc. 1018 pp. Ill. 9 x 12 in.

**The Stanley Works,** New Britain, Conn.
11. *Wrought Hardware. New* 1921 *Catalog.* This new catalog describes additions to the Stanley line of Wrought Hardware, as well as the older well known specialties and various styles of butts, hinges, bolts, etc. 376 pp. Ill. 6½ x 9½ in.

12. *Garage Hardware.* Booklet, illustrated. Garages and their equipment, such as hinges, hasps, door holders, latch sets, chain and hand bolts, showing illustrations and text with dimensions of garages, describing the Stanley Works product. Size 6 x 9 in. 24 pp.

13. *Eight Garages and Their Stanley Hardware.* Booklet. Plans, drawings and complete hardware specifications. Size 5 x 7 in. 32 pp.

127. *The Stanley Works Ball Bearing Butts.* Booklet, illustrated. Description, with full size illustrations of many typed butts and their parts, dimensions and finish. Size 5 x 7½ in. 32 pp.

**Vonnegut Hardware Co.,** Indianapolis, Ind.
309. *Von Duprin Self-Releasing Fire Exit Devices.* A catalog and educational work on panic-proof, burglar-proof self releasing exit devices for doors and windows of buildings of any kind of occupancy. 41 pp. Ill. 8 x 11 in.

310. *Prince Self-Releasing Fire Exit Devices. Supplement to Von Duprin Catalog No.* 12. Contains valuable information for architects on the selection, detailing, etc., of Prince devices for doors and windows to insure safety against fire panic. 32 pp. Ill. 8 x 11 in.

## HEATING

**Alberger Heater Company,** Buffalo, N. Y.
307. *Heating and Cooling Equipment. Catalog No.* 3. A useful manual for architects in addition to serving as a catalogue of heating and cooling equipment. Explains fully the advantages of spirally corrugated heater tubing. 48 pp. Ill. with line cuts and half tones. 7¾ x 10¾ in.

**American Radiator Company,** 104-108 W. 42nd St., New York, N. Y.
427. *Ideal-Arcola Heating Outfits.* A book describing a system of hot water heating for small and medium size houses. The boiler is placed in a room and resembles a stove. No cellar required. The ash carrying reduced to a minimum. 24 pp. Ill. 6 x 8½ in.

**American District Steam Co.,** North Tonawanda, N. Y.
421. *ADSCO.* Bulletin 158 tells in an interesting way about modern heating. 16 pp. Bulletin 159 gives valuable data for calculating radiation required in building. Tells how old systems may be remodelled to bring temperature in each room under perfect control. 16 pp. Both bulletins illustrated. 6 x 9 in.

**Crane Company,** 836 So. Michigan Ave., Chicago, Ill.
241. *Steam Catalogue.* A book containing full descriptions of the complete line of Crane valves, fittings, etc., 800 pp. Ill. 6 x 9 in.

**The Farquhar Furnace Company,** Wilmington, Ohio.
355. *Healthful Helpful Hints.* A discussion of furnace and chimney design and capacity for hot air heating and ventilation. 16 pp. Ill. 4¾ x 9¼ in.

356. *A Plain Presentation to Dealers.* A book of selling talk for dealers in Farquhar Furnaces. Four model heating layouts are shown and there is a page of useful "Do and Don't" advice. 24 pp. Ill. 8½ x 11 in.

**Hess Warming & Ventilating Co.,** 1209 Tacoma Bldg., Chicago, Ill.
178. *Modern Furnace Heating.* An illustrated book on the Hess Welded Steel Furnaces, Pipe and Pipeless, notes for installation, sectional views, showing parts and operation, dimensions, register designs, pipes and fittings. Size 6 x 9½ in. 48 pp.

**Jenkins Bros.,** 80 White St., New York, N. Y.
235. *Catalog No.* 21. This catalog contains descriptions of all the valves, packing, etc., manufactured by Jenkins Bros. Includes also dimensions and price lists of valves and parts. 271 pp. Ill. 4 x 6¾ in. Stiff paper cover.
237. *The Valve Behind a Good Heating System.* This booklet describes Jenkins Radiator Valves, Automatic Air Valves and other valves used in connection with steam and hot water heating. 16 pp. Ill. 4½ x 7¼ in. Stiff paper cover.

**Johnson Service Company,** 149 Michigan St., Milwaukee, Wis.
391. *The Regulation of Temperature and Humidity.* A description of the Johnson System of temperature regulation and humidity control for buildings; showing many kinds of thermostatic appliances for automatically maintaining uniform temperatures. 63 pp. Ill. 8½ x 11 in.

392. *Johnson Electric Thermostats, Valves and Controllers.* A catalog of devices mentioned in the title. 24 pp. Ill. 3½ x 6 in.

**The Wm. H. Page Boiler Co.,** 141 West 36th St., New York, N. Y.
F487. *Page Boilers for Steam and Hot Water Heating.* A complete catalog containing descriptions of, and specifications for, Page boilers and accessories. Several pages are given of valuable rules and data for figuring heating. 83 pp. Ill. 4½ x 7½ in.

**Richardson & Boynton Co.,** New York, N. Y., Chicago, Ill., Philadelphia, Pa., Providence, R. I., Boston, Mass.
290. *The Richardson Vapor-Vacuum-Pressure Heating System.* An interesting book which presents in clear non-technical language the principles of Vapor-Vacuum-Pressure heating; the economy over ordinary steam heating; steam and hot-water systems may be altered to use this principle with views of buildings where the V-V-P system is installed. 14 pp. Ill. 8 x 11 in.

291. *Perfect Warm Air Furnaces. No.* 203. Contains a full description of various types of warm air furnaces and parts, with dimensions and necessary data. 24 pp. Ill. 8 x 10¼ in.

292. *Perfect Cooking Ranges.* Description and dimensions of the complete line of the new high enamel finish Richardson Perfect ranges, with charts and information regarding combination coal and gas cooking ranges. 40 pp. Ill. 8½ x 11 in.

**The H. B. Smith Co.,** Westfield, Mass.
431. *General Boiler & Radiator Catalog.* A descriptive catalog giving ratings, dimensions, capacities and working pressures. 90 pp. Ill. 4 x 7 in.

432. *Heating Data Books.* One is an Engineers' Data Ring Book. 125 pp. Ill. 4 x 7 in. Others consist of loose leaf binders to hold special matter. 8½ x 11 in.

**Sterling Engineering Company,** 419 Third St., Milwaukee, Wis.
430. *Sterling Bulletins.* No. 33 describes the Sterling System of vacuum heating. 11 pp. No. 32 describes the Sterling System of vapor heating. 14 pp. No. 31 describes the Sterling slide valve return trap. 4 pp. They are all illustrated. 6 x 9 in.

**Tuttle & Bailey Mfg. Co.,** 2 West 45th St., New York, N. Y.
395. *About Radiator Enclosures.* A book showing how easily and effectively unsightly radiators may be concealed by enclosures which adorn a room. 15 pp. Ill. 6¾ x 9¾ in.

396. *Special Designs. Catalog* 66*A.* A book of designs for grilles, screens, registers and ventilators to be used in connection with heating installations. Made of bronze, brass, iron and steel. 40 pp. Ill. 6¾ x 9¾ in.

## HEATING AND VENTILATION

**American Blower Co.,** Detroit, Mich.
361. *Sirocco Service.* A monthly publication containing descriptions of heating and ventilating systems installed by the American Blower Company, together with useful data for architects and engineers. 16 pp. Ill. 8½ x 11 in.
362. *General Catalog "ABC" Products.* A book full of useful data for all men who have to deal with heating and ventilating problems. 132 pp. Ill. 8½ x 11 in.

**Buffalo Forge Co., 490 Broadway,** Buffalo, N. Y.
215. *Buffalo Fan System of Heating, Ventilating and Humidifying.* Catalog 700. This contains a general discussion of heating and ventilating under four heads: Part 1, Public Buildings. Part 2, Industrial Plants. Part 3, Buffalo Apparatus. Part 4, Fan Engineering.

# "JIFFY" FIRE EXTINGUISHING APPARATUS

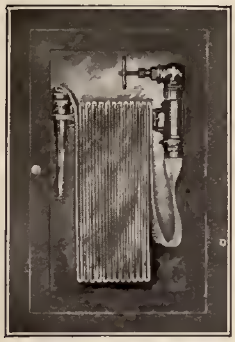
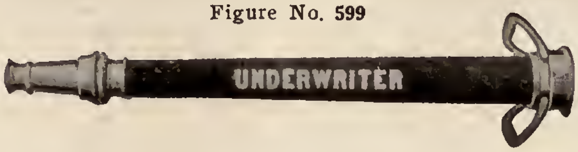


Plate No. 600

Figure No. 599



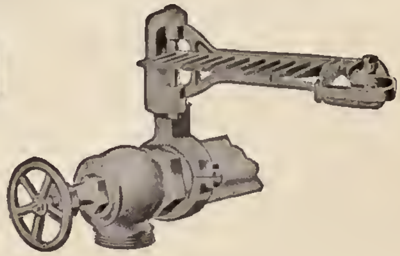



Figure J

**The JIFFY Fire Hose Racks as illustrated for installation in Factories, Loft and Office Buildings, Hotels, Hospitals, Residences, Theatres, etc.**

**1 inch, 1¼ inch, 1½ inch, 2 inch and 2½ inch Underwriters Labelled Linen Hose carried in stock.**

**Figure No. 610**

Jiffy Brass Siamese Connection, Tubing and Flange with space for contractors advertisement.

**Figure No. 615**

Jiffy Brass Siamese Connection with combination wall flange and sill cocks, space for contractors advertisement.

**Figure No 599**

Underwriters Play Pipe, 2½ inch x 30 inch long, made in strict accordance with specifications of the Associated Factory Mutual.

**Plate No 600**

Jiffy Hose Cabinet made of iron or any other metal, either painted, enameled or plated as desired.

**Figure No. 2**

Jiffy Fire Hose Rack hinged to the wall by means of a wall plate. Shelf down as it would appear after delivering hose.

**Figure No. 710**

Jiffy Copper Chemical Fire Extinguishers test to 350 pounds pressure.

**Illustration C**

Acceptable to U. S. Government. This Jiffy Rack is hinged to lugs cast on extension piece attached to valve.

**Figure No. 701**

Jiffy Fire Hose Valve made in six sizes in all finishes, male or female.

**Figure J**

The Jiffy Space Saver Rack Clamp Holder. Can be used where space from wall to back of valve is as small as one inch.

**Figure No. 700**

Jiffy Hose Gate Valve, in all sizes and finishes with or without caps.

**Figure No. 1**

The Jiffy Fire Hose Rack hinged to Fire Stand Pipe by means of a Pipe Clamp. Shelf up ready for hose.

**Note**—No pins, loops or other loose or detached parts to catch or interfere or get lost.


Figure No. 615

Figure No. 700

Figure No. 701

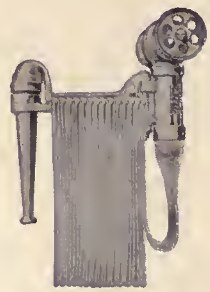


Illustration C

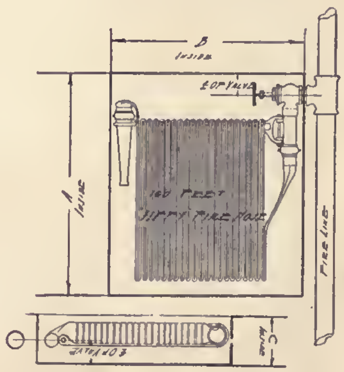



Figure No. 610


Figure No. 710

| Length of Hose | Size | "A" | "B" | "C" | Centre of Valve from Back | Centre of Valve from Top |
|---|---|---|---|---|---|---|
| 25 Feet | 1½ & 2" | 22" | 20½" | 7½" | For 1½"—3¼" | 3½" |
| 50 Feet | " | 33" | 20½" | 7½" | For 2"—3½" | 3½" |
| 75 Feet | " | 33" | 26" | 7½" | For 2½"—4½" | 4½" |
| 100 Feet | " | 33" | 31" | 7½" | | |
| 25 Feet | 2½" | 33½" | 20½" | 9" | | |
| 50 Feet | " | 33½" | 20½" | 9" | | |
| 75 Feet | " | 33½" | 26" | 9" | | |
| 100 Feet | " | 33½" | 31" | 9" | | |

Figure No. 2

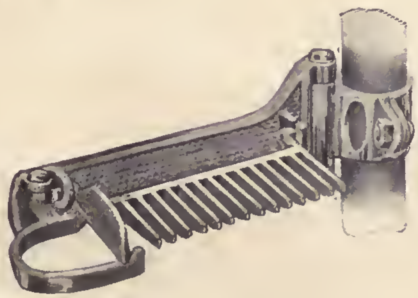


Figure No. 1

***American Architect Specification Manual—Page 143 Sweet's Index, 16th Annual Edition—Pages 1416-17***

# JIFFY FIRE HOSE RACK CO.

**133 West 52nd St., New York**

# REFERENCE LIST OF BUSINESS LITERATURE—Continued

**HEATING AND VENTILATION**

**The H. W. Nelson Corporation (formerly Moline Heat),** Moline, Ill.

411. *Univent Ventilation. Architects' and Engineers' Edition.* A scientific treatise on ventilation for schools, offices and similar buildings; with 40 pages of engineering data on ventilation for architects and engineers. 72 pp. Also "Supplement A" on Air Conditioning. 12 pp. Ill. with half-tones, line drawings and designing charts. 8½x11 in.

**HEAT REGULATORS**

**Minneapolis Heat Regulator Co.,** Minneapolis, Minn.

134. *The Heart of the Heating Plant.* An illustrated catalog, describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used. Complete catalog and list prices. Size 6 x 9 in. 20 pp.

**HOISTS—See Elevators and Ash Hoists**

**INCINERATORS—See Garbage Destroyers**

**INSULATION—See also Stucco Base**

**United States Mineral Wool Co.,** 280 Madison Ave., New York.

83. *The Uses of Mineral Wool in Architecture.* Illustrated booklet. Properties of insulation against heat, frost, sound, and as a fire-proofing, with section drawings and specifications for use. It gives rule for estimate and cost. Size 5¼ x 6⅝ in. 24 pp.

**IRON AND STEEL—See also Metals**

**The American Rolling Mill Co.,** Middletown, Ohio.

233. *Armo in Picture and Fact.* A booklet describing the manufacture of pure iron in sheets and giving useful tables of sheet sizes and weights. 247 pp. Ill. 6 x 9 in.

234. *Why Steel and Iron Rust.* A booklet full of interesting data. 16 pp. Ill. 3¼ x 6¼ in.

**KITCHEN EQUIPMENT**

**Bramhall, Deane Co.,** 261-A West 36th St., New York.

59. *The Heart of the Home.* Booklet, illustrated. Deane's French Ranges (all fuels), cook's tables and plate warmers. Size 6 x 9 in. 32 pp.

**The Prometheus Electric Co.,** 513 West 42nd St., New York.

145. *Prometheus Electric Plate Warmers.* Leaflets illustrating the plate warmer, describing its construction, utility and types, adaptable for residences and hotels, according to specifications. Sizes and dimensions. Size 5⅝ x 9 in.

**LATH, METAL**

**American Steel & Wire Co.,** Chicago, Ill.

228. *Stucco Houses Reinforced With Triangle Mesh Fabric.* A pamphlet containing valuable data on stucco work with tables of quantities of materials and many illustrations of houses covered with stucco applied on Triangle Mesh Fabric. 24 pp. Ill. 6 x 9 in.

**Concrete Engineering Co.,** Omaha, Neb.

346. *How to Use Ceco Lathing Materials.* An illustrated treatise on the use of expanded metal lath. Contains construction details and complete specifications, with sample piece of lath in pocket on cover of book. 16 pp. Ill. 8½ x 11 in.

**National Steel Fabric Co.,** Union Arcade Building, Pittsburgh, Pa.

F491. *National Stucco-Plaster Fabric.* A complete description, with specifications of a stucco reinforcement which is also a metal lath. 6 pp. Ill. 8½ x 11 in.

**The Sykes Metal Lath and Roofing Company,** Niles, Ohio.

F486. *Sykes Metal Lath for all Purposes.* A booklet on the use of metal lath with specifications for stucco and plastering. 20 pp. Ill. 6 x 9 in.

**Truscon Steel Company,** Youngstown, Ohio.

316. *Hy-Rib and Metal Lath.* Tables, general data and illustrations of Hy-rib and metal lath construction. 6 pp. Ill. 8½ x 11 in.

**LAUNDRY EQUIPMENT**

**The American Laundry Machinery Co., Advertising Dept.,** Cincinnati, Ohio.

84. *Catalog.* Illustrated. Washing machines, accessories, extractors, clothes tumblers, drying and ironing machines, etc., showing various types and electrical controls with specifications and dimensions for the installation and use of laundry machinery in laundries, institutions, hotels; also for mill and community laundries. Size 12½ x 9½ in. 218 pp.

**Chicago Dryer Co.,** 2210 N. Crawford Ave., Chicago, Ill.

66. *Laundry Appliances.* Illustrated catalog. Descriptions of Laundry Dryers, Electric Washing Machines and Ironing Machines, especially adapted for use in residences, apartment buildings and small institutions. Size 8½ x 11 in. 48 pp.

**The Pfaudler Co.,** Rochester, N. Y.

322. *Pfaudler Chutes for Economy.* Folder showing illustrations, drawings and description of the Pfaudler Laundry Chute giving dimensions for installations. Size 3⅞ x 8⅞ in. 8 pp.

**LIGHTING—See also Electrical Equipment**

**American Three Way Luxfer Prism Co.,** 13th Street and 55th Court, Chicago, Ill.

424. *Daylighting.* Catalog 21. A complete catalog on glass prisms for use in transoms, sidewalk and floor lights, skylights, etc., for lighting places inaccessible to direct daylight. Contains also measurements, specifications and other data required by designers. 42 pp. Ill. 8½ x 11 in.

**I. P. Frink, Inc.,** 24th St. and 10th Ave., New York.

150. *Light Service for Hospitals. Catalogue* 421. A booklet illustrated with photographs and drawings, showing the types of lights for use in hospitals, as operating table reflectors, linolite and multilite concentrators, ward reflectors, bed lights and microscopic reflectors, giving sizes and dimensions, explaining their particular fitness for special uses. Size 7 x 10 in. 12 pp.

218. *Picture Lighting. Booklet* 422. A pamphlet describing Frink Reflectors for lighting pictures, art galleries, decorated ceilings, cove lighting, the lighting of stained glass, etc., and containing a list of private and public galleries using Frink Reflectors. 24 pp. Ill. 5¼ x 7 in.

219. *Frink Reflectors and Lighting Specialties for Stores. Catalog No.* 424. A catalog containing a description of the Frink Lighting System for Stores; the Synthetic System of Window Illumination; and a number of appliances to produce the most effective lighting of displayed objects. 20 pp. Ill. 8 x 11 in.

220. *Frink Lighting Service for Banks and Insurance Companies. Reflectors. Catalog No.* 425. A very interesting treatise on the lighting of offices; with details of illustrations and description of lamps and reflectors. Contains a list, covering several pages, of banks using Frink Desk and Screen Fixtures. 30 pp. Ill. 8¼ x 11 in.

**Harvey Hubbell, Inc.,** Bridgeport, Conn.

401. *Hubbell Flush Door Receptacles.* Description of a safe, convenient and practical wall outlet de luxe for fine residences, clubs, hotels, public buildings and offices. 4 pp. Ill. 8 x 10 in.

**Lightolier Company,** 569 Broadway, New York, N. Y.

412. *After Sunset Lightoliers.* A beautiful catalog and price list of electric lighting brackets and suspension fixtures. 16 pp. Ill. 8 x 10¼ in.

**Luminous Unit Co.,** St. Louis, Mo.

210. *"Brascolite Bulletin" No. 1.* Architectural Series on Hospitals, showing illustrations of various hospitals equipped with Brascolites, Aglites, and other Luminous Unit Co. products. 28 pp. Ill. 8 x 10½ in.

217. *Regular "Brascolite" Catalogue No.* 8. This catalogue contains descriptions with illustrations of Brascolites, Aglites, Elites, Industrolites, and Lumovitro for all classes of buildings. 28 pp. Ill. 8 x 10½ in.

**National X-Ray Reflector Company,** 235 Jackson Blvd., Chicago, Ill.

405. *How to Know and Have Good Lighting.* A treatise on the development of lighting. Beautifully illustrated photographs and descriptions of lighting installations in every kind of building from a variety of applications including ceiling fixtures, art lamps, floor pedestals, cornices, coves and other special adaptations. It also gives a list of buildings where X-Ray Eye Comfort Lighting has been used. Size 7⅝ x 10 inches. 48 pp.

**The Reflectolyte Co.,** 914 J Pine St., St. Louis, Mo.

244. *"Reflectolyte" Catalog No. 4.* Description, Engineering Data, descriptions and prices of the well known type of reflector and suspended bowl lighting fixtures. 32 pp. Ill. 7¼ x 10¾ in.

**Mitchell Vance Co., Inc.,** 503-511 West 24th St., New York, N. Y.

369. *Catalog No. 25.* A descriptive catalog, with prices, of the "T. R. B." Lighting Unit, for perfect distribution of light without glare and without shadows. 24 pp. Ill. 8 x 10 in.

**LINOLEUM—See also Flooring**

**Armstrong Cork Co., Linoleum Department,** Lancaster, Pa.

223. *Armstrong's Linoleum Floors.* A handbook for architects, published in the file form of (8½ x 11 in.) recommended by the American Institute of Architects. A technical treatise on Linoleum containing general information, tables of grades, gauges and weights, specimen specifications, and detailed directions for laying linoleum. Profusely illustrated in colors.

**LOCKERS, STEEL—See Factory Equipment**

**LUMBER**

**The Long-Bell Lumber Co.,** R. A. Long Building, Kansas City, Mo.

203. *From Tree to Trade.* This book tells the story of the manufacture of lumber. Gives an idea of the scope of the business and the care and attention given to the manufacture and grading of Long-Bell trade-marked products. 100 illustrations. 48 pp. 8½ x 11 in.

**The Pacific Lumber Company of Illinois,** 2060 McCormick Bldg., Chicago, Ill.

363. *Construction Digest*— The use of California Redwood in residential and industrial construction. Contains illustrations, grading rules, specifications and other technical data for architects and builders. 16 pp. Ill. 8½ x 11 in.

364. *Engineering Digest*— The use of California Redwood in industrial construction and equipment for factories, railroads, mines and engineering projects. 16 pp. Ill. 8½ x 11 in.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# REFERENCE LIST OF BUSINESS LITERATURE—Continued

**LUMBER, ASBESTOS**

**Asbestos Shingle, Slate & Sheathing Co.,** Ambler, Pa.
54. *Ambler Asbestos Building Lumber.* Catalog illustrated. Describes uses of this fireproof product for both exteriors and interiors. Tables of sizes and illustrations of various types of buildings in which it has been used. Size 8½ x 11 in. 32 pp.

**MAIL CHUTES**

**Cutler Mail Chute Co.,** Rochester, N. Y.
294. *The Cutler Mail Chute. Model F.* Describes the Cutler Mail Chute in its standard form, known as Model F. Contains data for preparatory work to be done before installation. 16 pp. Ill. 4 x 9¼ in.

**MANTELS**

**The Fisher & Jirouch Co.,** Cleveland, Ohio.
476. *Mantels.* A presentation of a few of the mantels made by this company. Mantels are made in either wood or art stone in regular or special designs. 16 pp. Ill. 9 x 12 in.

**Edwin A. Jackson & Bro., Inc.,** 50 Beekman St., New York.
90. *Wood Mantels.* Portfolio. Woodmantel designs of various types and openings, giving dimensions, projections and showing fireplace grate designs. Size 9 x 6¼ in. 32 pp.

**MEMORIALS**

**Harrison Granite Co.,** 200 Fifth Ave., New York.
151. *Memorials.* Booklet showing photographic illustrations and text of monumental pieces and memorials, of granite, ranging from monuments of public interest to simple private tributes. Size 4 x 9 in. 24 pp.

**METALS—See also Iron and Steel**

**American Brass Co.,** Main Office, Waterbury, Conn.
138. *Price List and Data Book.* Illustrated. Loose-leaf Catalog. Covers entire line of Sheets, Wire Rods, Tubes, etc., in various metals. Useful tables. Size 3⅞ x 7 in. 168 pp.
139. *Illustrated Pamphlets.* Describes the use and adaptability of Extruded Architectural Shapes, Benedict Nickel, Brass and Copper Pipe in Iron Pipe sizes for plumbing installations. 8½ x 11 in.
385. *Copper Products.* Illustrated price list and tables of weights. Covers copper for roofing purposes, including strip copper for forming into leaders, gutters, valleys, flashings, etc. 64 pp.

**American Sheet & Tin Plate Co.,** Frick Building, Pittsburgh, Pa.
452. *Reference Book. Pocket Edition.* Covers the complete line of Sheet and Tin Mill Products. 168 pp. Ill. 2½ x 4½ in.
F427. *Black Sheets and Special Sheets.* A catalog describing standard grades of black and uncoated sheets, together with weights, building tables, etc. 28 pp. Ill. 8½ x 11 in.

**Bridgeport Brass Co.,** Bridgeport, Conn.
483. *Seven Centuries of Brass Making.* A brief history of the ancient art of brass making and its early (and even recent) method of production—contrasted with that of the Electric Furnace Process—covering tubular, rod and ornamental shapes. 80 pp. Ill. 8 x 10½ in.

**The Cincinnati Mfg Co.,** Cincinnati Ohio.
349. *Ornamental Iron and Bronze.* A catalog of metal work for banks, mausoleum bronze and tablets, hollow metal and kalamein doors, elevator cars and enclosures, builders' iron and wire work. 164 pp. Ill. 7½ x 10¾ in.

**Copper & Brass Research Association,** 25 Broadway, New York, N. Y.
466. *How to Build a Better Home.* A book on building written for the prospective builder. It contains keyed illustrations of houses and details of houses and should be of value to architects in explaining technical terms to clients. 30 pp. Ill. 7¾ x 10½ in.

**Rome Brass & Copper Company,** Rome, N. Y.
473. *Price List No. 70.* A loose-leaf binder containing full price list of Rome Quality products, together with useful tables. 5⅛ x 7¼ in.

**MILLWORK—See also Lumber—Building Construction—Doors and Windows**

**MORTAR—See also Cement**

**Louisville Cement Company, Inc.,** Louisville, Ky.
311. *Brixment, the Perfect Mortar.* The reading of this little book gives one a feeling that definite valuable information has been acquired about one of the oldest building materials. Modern science has given the mason a strong water-resisting mortar with the desirable "feel" of the best rich lime mortar. 16 pp. Ill. in colors. 5½ x 7¾ in.

**MORTAR COLORS—See also Paints, Stains, Varnish**

**Ricketson Mineral Paint Works,** Milwaukee, Wis.
376. *Ricketson Mortar Colors.* Two interesting folders with color card of these well known fadeless mortar colors in use for 35 years. 3¼ x 6 in.

**MOLDINGS, METAL**

**National Metal Molding Co.,** 25 Fulton Bldg., Pittsburgh, Pa.
85. *Bulletins.* Bound in a standard correspondence folder suitably indexed for convenient filing, describes complete line of metal moldings.

**National Metal Molding Co.,** 25 Fulton Bldg., Pittsburgh, Pa.
152. *Hand-book for the Man on the Job.* An illustrated book of fittings and methods with description and instructions for installing National Metal Molding under all conditions; a book meant to be conveniently carried and used on the job. Size 4⅜ x 6 in. 102 pp.

**ORNAMENT METAL WORK—See also Architectural Iron Work—Metals**

**Newman Manufacturing Company,** 416 Elm St., Cincinnati, Ohio.
229. *Newman Ornamental Metal Work—Catalog A.* Booklet showing installations of brass and bronze railings, door hardware, grille work, etc., in banks, theatres and other public buildings. Also shows lighting fixtures and special metal work of all descriptions. 64 pp. Ill. 8 x 11 in.

**John Polachek Bronze & Iron Co.,** Long Island City, N. Y.
F484. *Distinctive Metal Work.* A circular illustrating distinctive metal work executed by this firm together with a long list of names of buildings in which their work may be seen. 8 pp. Ill. 8½ x 11 in.

**PAINTS, STAINS, VARNISHES**

**Breinig Brothers, Inc.,** Third and Grand Sts., Hoboken, N. J.
210. *Color Cards;* contains suggestions for color combinations and painting in general; with descriptions for use and illustrations of the following paints; house paint, metal protective paint, shingle stain, enamel tints, floor and deck paint, "Wallsheen" (flat wall paint), barn and silo paint, screen paint.
211. *Cartons;* contains panels illustrating various effects obtained on woods by the use of Breinig Brothers Wood Finishes.

**Samuel Cabot, Inc.,** 141 Milk St., Boston, Mass.
341. *Cabot's Old Virginia White and Tints.* Describes a specially prepared "flat" white which architects say gives "the whitewash white effect." Also describes tints perfectly flat in tone giving the "pastel effect." Used on wood, brick, stone, and stucco. 16 pp. Ill. 4 x 8½ in.

**Carter White Lead Co.,** 12,042 South Peoria St., Chicago, Ill.
270. *The Carter Paint Calculator.* A valuable book containing answers and solutions to common paint problems; gives sample estimates; data useful to both architect and master painter. Black Fabrikoid cover. Vest pocket size 2½ x 4½ in. 70 pp. Sent postpaid anywhere on request.

**Joseph Dixon Crucible Co.,** Jersey City, N. J.
324. *Dixon's Silica-Graphite Paint.* A pamphlet describing the physical properties of silica-graphite paint and especially the wide difference between it and other protective paints. Contains also sample color card with specifications. 20 pp. and 6 pp. in color card. Ill. 3¼ x 6¼ in.

**A. C. Horn Company,** New York, N. Y.
300. *Color Card and Brief Description of various Horn Painting Specialties.* Koncrex, Protective Floor coating; Aclac, Service Paint; Symentrin, Flat Wall Finish; Symentrex (Liquid Concrete), a Complete Finish for Concrete or Brick; Horns House Paints (Gov't Specification).

**The New Jersey Zinc Co.,** 160 Front St., New York, N. Y.
227. *Painting Specifications.* A booklet full of useful information concerning paint mixtures for application on various surfaces.

**Ripolin Co., The,** Cleveland, Ohio.
419. *Ripolin Specification Book,* 8 x 10¼ in., 12 pp. Complete architectural specifications and general instructions for the application of Ripolin, the original Holland Enamel Paint. Directions for the proper finishing of wood, metal, plaster, concrete, brick and other surfaces, both interior and exterior, are included in this Specification Book.

**The Sherwin-Williams Co.,** 601 Canal Road, Cleveland, Ohio.
278. *Painting and Varnishing Specifications.* A complete specification text book on the painting and finishing of architectural surfaces. 30 pp. 8½ x 11 in.
279. *Portfolio of Flat-Tone Multi-Color Effects.* Containing samples and complete specifications for securing the latest and most beautiful effects in interior wall decoration. 2¼ x 6 in.

**PILES, CONCRETE**

**Raymond Concrete Pile Co.,** 140 Cedar St., New York.
156. *Raymond Concrete Piles—Special Concrete Work.* A booklet with data concerning the scope of the Raymond Concrete Pile Co., for special concrete work. It classifies piles, showing by illustration, text and drawings, the relative value of special shape and manufacture of piles. It gives formulæ for working loads, and relative economy. Size 8½ x 11⅛ in. 60 pp.

**MacArthur Concrete Pile and Foundation Co.,** 12 John St., New York, N. Y.
323. *Concrete Pile Standards.* This treatise gives standard details for pile caps with standard specifications for concrete piles and has a valuable chapter entitled, "How a Pile Supports Its Load." Useful tables are presented with worked examples of computations for typical and unusual conditions. 54 pp. Ill. 9 x 12 in.

Photograph of Industrial Bank of New York, showing the T. R. B Lighting Units, with which it is equipped. Charles E. Birge, Arch.

T. R. B. Globe is in one piece. Protected by U. S. Letters Patent.

The globe of the T. R. B. Lighting Unit is made in plain white finish, in the Classic etching (illustrated), in Adam, Colonial and Gothic etchings, and in special etchings to order. It is made with three different types of hangers and fitters for suspension from the ceiling, or to be set flush with the ceiling. It is made for wall-brackets. And it is made in two different kinds of glass (two-case Commercial and three-case Celestialite). In every instance, however, its patented shape is identical.

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THE patented shape of the T. R. B. Lighting Unit is not merely a new style in glass globes. It is that particular form which experiment and test has proved to produce artificial illumination of daylight quality.

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These are the reasons which secured T. R. B. installation in the Industrial Bank, as illustrated, and which are securing similar installations all over the country wherever the eyes have work to do.

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503-511 West 24th Street, New York City

*ESTABLISHED 1854*

# REFERENCE LIST OF BUSINESS LITERATURE—Continued

**PIPE—See also Metals**

**The Duriron Company,** Dayton, Ohio.
256. *Acid Proof Drain Pipe and Sanitary Fittings. A Message to Owner, Architect and Sanitary Engineer. Bulletin 126.* This bulletin explains the advantages of Duriron Pipe to resist the corrosive action of acids and alkalis. Contains drawings, tables of dimensions and full instructions for installation. 8 pp. Ill. 8 x 10½ in.

**National Tube Co.,** Frick Bldg., Pittsburgh, Pa.
437. *National Bulletin No. 25.* This bulletin is a valuable treatise on corrosion in pipes; flow of water; flow of steam; strength of pipes of various sizes when used as beams and as columns, etc., numerous tables and diagrams. 86 pp. Profusely illustrated. 8½ x 11 in.

**A. Wyckoff & Son Co.,** Elmira, N. Y.
397. *Wyckoff Wood Pipe. Catalog No. 42.* A description of machine-made woodstave pipe and Wycoff's cypress steam pipe casing. Contains also a number of pages of useful formulas and tables for hydraulic computations. 92 pp. Ill. 6 x 9 in.

**PIPE COVERING**

**The Philip Carey Co.,** Lockland, Cincinnati, Ohio.
379. *Pipe and Boiler Coverings. Catalog 1362.* A catalog and manual of pipe and boiler coverings, cements, etc. Contains a number of valuable diagrams and tables. 71 pp. Ill. 6 x 9 in.

**PLASTER BASE—See also Stucco Base**

**PLUMBING EQUIPMENT—See also Drains**

**A. P. W. Paper Co.,** Albany, N. Y.
326. *Toilet Cabinets.* A specification card for letter file containing complete descriptions with dimensions, capacity, etc., of Onliwon Cabinets for toilet paper. Illustrated.

**Bridgeport Brass Co.,** Bridgeport, Conn.
461. *Plumbing Supplies.* Catalog of adjustable swivel traps; basin and bath supplies and wastes; basin and sink plugs; low tank bends; iron pipe sizes of brass pipe. 20 pp. Ill. 8 x 10½ in.

**C. F. Church Manufacturing Company,** 430 Williams St., Holyoke, Mass.
430. *"White Pyralin" Catalog W. S.* A catalog of White Pyralin closet seats. They are made of the best material and covered with Pyralin, a pure white substance which is applied in sheet form and should not be confused with sprayed or enameled products. The surface is non-porous; can be washed with soap and water; does not turn yellow and is guaranteed not to crack or chip. 24 pp. Ill. 6 x 9 in.

**Crane Company,** 836 So. Michigan Ave., Chicago, Ill.
240. *General Plumbing Catalogue.* A very complete and well illustrated booklet describing the complete line of Crane plumbing goods. 800 pp. Ill. 8½ x 11 in.

**The Imperial Brass Co.,** 1200 W. Harrison St., Chicago, Ill.
95. *Catalog C.* Loose-leaf catalog. Illustrated. Describes Watrous equipment; drinking fountains, lavatories, sinks, flushing valves, urinals, seats and all other necessary equipment of the best types of plumbing fixtures. Size 8½ x 10¾ in. 62 pp.
98. *Watrous Gravity Liquid Soap System.* Loose-leaf Catalog. Giving photographs of all details of equipment with description of their use. Size 8½ x 10¾ in. 6 pp.

**Jenkins Bros.,** 80 White St., New York, N. Y.
236. *Jenkins Valves for Plumbing Service.* This booklet contains all necessary information about Jenkins Valves commonly used in plumbing work. 16 pp. Ill. 4¼ x 7¼ in. Stiff paper cover.

**Kohler Company,** Kohler, Wisconsin.
209. *"Kohler of Kohler."* A booklet on enameled plumbing ware describing processes of manufacture and cataloging staple baths, lavatories, kitchen sinks, slop sinks, laundry trays, closet combinations. 48 pp. Ill. 6⅛ x 8 in. Roughing-in Measurement Sheets 5 x 8 in.

**Thomas Maddock's Sons,** Trenton, N. J.
259. *General Catalog.* Contains complete description of the full line of fixtures styled the "Highest Grade Standardized Plumbing Fixtures for Every Need." 94 pp. Ill. 5 x 7½ in.
260. *Specifications for Plumbing Fixtures.* Contains tables of specifications for industrial buildings, schools, apartments, hotels, etc. 8 pp. Ill. 9 x 12 in.

**The Vulcan Brass Manufacturing Co.,** Cleveland, Ohio.
214. *Paragon Ball Bearing Self Closing Faucets, Bibbs and Stops—Catalog B.* Illustrated book, showing sectional drawings, illustrations and text describing "Paragon" self-closing work, high pressure ball cocks, parts and valves.

**Wheeling Sanitary Manufacturing Co.,** Wheeling, W. Va.
388. *Complete Catalog "E."* Describes all clay Sanitary Baths, Lavatories, Kitchen Sinks, Laundry Trays, Drinking Fountains and Urinal Stalls of Semi-vitreous Porcelain ware; also Closet Bowls, Flush Tanks, Lavatories, Basins, Urinals and Drinking Fountains of White Vitreous Chinaware. 125 pp. Ill. 6 x 8 in.

**Wheeling Sanitary Manufacturing Co.,** Wheeling, W. Va.
398. *Combination Bath.* A circular describing a new form of bath which combines a seat bath, foot bath, shower bath and child's bath. Occupies much less space than the ordinary bath tub. 12 pp. Ill. 3½ x 6¼ in.

**PUMPS**

**The Dayton Pump and Manufacturing Company,** Dayton, Ohio.
475. *Electric House Pumps and Water Supply Systems.* A heavy paper binder containing illustrated bulletins 8½ x 11 in. These bulletins describe pumps as well as complete automatic electric and gasoline water supply systems and all accessories, together with specifications, detail drawings and tables of dimensions. 48 pp.

**The Goulds Manufacturing Company,** Seneca Falls, N. Y.
387. *Power Pump Bulletins.* There are 22 of these bulletins treating on piston, plunger, air pressure, vacuum, triplex and centrifugal pumps. Bulletin 112 and Bulletin 122 containing the theory of pumps together with power pump data are of especial value to engineers in the offices of architects. 16 to 36 pp. Ill. 8 x 10 in.

**REFRIGERATION**

**The Automatic Refrigerating Co.,** Hartford, Conn.
298. *The Mechanics of Automatic Refrigeration and Automatic Refrigeration for Hospitals and Sanatoriums.* Two essential booklets for the library of designers and specification writers. 24 and 28 pp. Ill. 8½ x 11 in.
370. *Automatic Refrigeration for Retail Markets.* A valuable treatise on the subject matter mentioned in the title. 30 pp. Ill. 8½ x 11 in.

**The Jewett Refrigerator Company,** 27 Chandler Street, Buffalo, N. Y.
231. *Refrigeration and Health. Vital Facts You Ought to Know.* A booklet outlining the basic requirements of a good refrigerator and explaining how to use a refrigerator to secure best results 16 pp. Ill. 4¾ x 7¾ in.

**REFRIGERATORS**

**McGray Refrigerator Co.,** Kendallville, Ind.
472. *Refrigerators and Cooling Rooms, Cat. 53.* A catalog of cooling equipment for hotels, restaurants, hospitals, institutions, colleges and clubs. Catalog No. 96 deals with refrigerators for residences. 52 pp. each. Ill. in colors. 7½ x 10 in.

**ROOFING—See also Slate—Metals—Shingles**

**American Sheet & Tin Plate Co.,** Frick Building, Pittsburgh, Pa.
463. *Copper—Its Effect Upon Steel for Roofing Tin.* Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy. 28 pp. Ill. 8½ x 11 in.

**Asbestos Shingle, Slate & Sheathing Co.,** Ambler, Pa.
53. *Ambler Asbestos Corrugated Roofing.* Catalog gives complete data for specifying, drawings, methods of application, tables, etc. Size 8½ x 11 in. 20 pp.

**The Barber Asphalt Paving Company,** Land Title Bldg., Philadelphia, Pa.
422. *Standard Trinidad Built-Up Roofing Specifications.* Contains two specifications for applying a built-up roof over boards and two for applying over concrete. Gives quantities of materals and useful data. 8 pp. 8 x 10½ in. Ask at same time for Good Roof Guide Book, 32 pp. Ill. 6 x 9 in.

**The Barrett Company,** 40 Rector St., New York, N. Y.
403. *Roof Flashings Handbook.* A complete descriptive account. Illustrated with photographs and architectural blue print drawings, of the new Barrett Standard Roof Flashings. The various types are shown with specifications for their installation. 50 pp. Ill. 6 x 9 in.
404. *Architectural Service Sheets.* Sheets containing valuable data and information for architects, each dealing with the following products separately: Holy Roof Connection; Barrett Roof Flashings; Barrett Specification Roofs. Full specifications given in each case. Illustrated with photographs and architectural drawings. 16½ x 22½ in.

**The Copper and Brass Research Association,** 25 Broadway, New York, N. Y.
468. *Copper Roofing.* Weights of various roofing materials. Up-to-date practice in the laying of copper roofs—Batten or wood rib method, Standing seam method, Flat copper roofs, Copper shingles, Suggestions for avoiding error and obtaining the full value of copper, Decorative effects and how to obtain them. Flashings, reglets, gutters and leaders. Cornices. Copper-covered walls. Specifications. 32 pp. Ill. 8½ x 11 in.

**The Philip Carey Co.,** Lockland, Cincinnati, Ohio.
378. *Architects' Specification Book on Built-up Roofing.* A manual for detailers and specification writers. Contains complete details and specifications for each type of Carey Asphalt Built-up Roof. 20 pp. Ill. 8½ x 11 in.

**Ludowici-Celadon Co.,** Chicago, Ill.
120. *Roofing Tile.* A detailed Reference for Architects' Use. Sheets of detailed construction drawings to scale of tile sections of various types and dimensions, giving notes of their uses and positions for various conditions of architectural necessity. Size 9½ x 13½ in. 106 plates.

**Vendor Slate Co.,** Easton, Pa.
333. Occasional brochures on architecturally pertinent phases of roofing slate sent on request. See also listing under Slate.

# REFERENCE LIST OF BUSINESS LITERATURE—Continued

**ROOF-LIGHTS—See Glass Constructions**

**SCREENS**

**American Wire Fabrics Company,** 208 So. La Salle St., Chicago, Illinois.
**305.** *Catalog of Screen Wire Cloth.* A catalog and price list of screen wire cloth, black enamelled, galvanized, aluminoid, copper bronze. 30 pp. Ill. 3½ x 6¼ in.

**The Higgin Manufacturing Co.,** 5th and Washington Ave., Newport, Ky.
**353.** *Screen your Home in the Higgin Way.* A description of Higgin door and window screens with practical data. 16 pp. Ill. 8½ x 11½ in.

**The New Jersey Wire Cloth Company,** 614 South Broad St., Trenton, N. J.
**409.** *A Matter of Health and Comfort. Booklet No. 2331.* A booklet telling all about screens, the durability of copper and its superiority over all other metals for screen purposes. 16 pp. Ill. 5x7¾ in.

**SCREW HOLES**

**The Stine Screw Holes Co.,** Waterbury, Conn.
**213.** *The Only Screw Holes in the World.* A four-page leaflet. 8½ x 11 in., showing exact sizes with prices for immediate delivery. Screw Holes are driven into a drilled hole with a hammer. When Driving Head is removed a permanent Brass Screw Hole is left.

**SEWAGE DISPOSAL**

**Aten Sewage Disposal Co.,** 286 Fifth Ave., New York City.
**474.** *Efficiency in Sewage Disposal.* A book describing a combination of septic tank with filtration fields; a treatise in miniature. Contains valuable tables and cuts. 24 pp. Ill. 6 x 9 in. Ask also for booklet *"Helping Nature."*

**SHINGLES—See also Roofing**

**Illinois Zinc Company,** 280 Broadway, New York, N. Y.
**417.** *The Roof That's Always New.* A description of pre-oxidized zinc shingles. They have the shape of wooden butt-shingles and a handsome weather gray color so they are as beautiful and artistic as wooden shingles. 11 pp. Ill. 3½ x 6 in.

**The Philip Carey Co.,** Lockland, Cincinnati, Ohio.
**381.** *Carey Asfaltslate Shingles.* Folder containing illustrations of attractive buildings and residences on which Carey Asfaltslate Shingles have been used. Describes this type of shingle, showing its special claims and advantages.

**SKYLIGHTS—See Glass Constructions**

**H. H. Robertson Company,** 1st National Bank Bldg., Pittsburgh, Pa.
**87.** *Robertson Glazing Construction.* Booklet, illustrated. Types of construction used in industrial, commercial and educational buildings, residences and hospitals, giving description, diagrams, tables of sizes and details of construction. Size 8 x 10½ in. 40 pp.

**SLATE—See also Roofing**

**Vendor Slate Co., Inc.,** Easton, Pa.
**332.** *The Vendor Book of Roofing Slate for Architects.* Contains original information on slate in various architectural uses; history, geology, sundry practical matters; complete descriptive classification; extended treatise on architectural roof design and specifications. 24 pp. Ill. 8½ x 11 in.

**STAINS—See also Paints, Stains, Varnishes**

**STONE**

**Indiana Limestone Quarrymen's Assn.,** P. O. Box 503, Bedford, Indiana.
**37.** *Indiana Limestone.* Illustrated booklet, Vol I, of the Limestone Library. Size 6 x 9 in. 36 pp.
**147.** *Designs for Houses of Indiana Limestone.* A booklet of the best designs submitted in a competition for a detached residence faced with Indiana Limestone. Size 8½ x 11 in. 32 pp.
**265.** *Folders: Series D.* Structural detail and data sheets showing methods of detailing cut stone work in connection with modern building construction. 4 pp. each. 8½ x 11 in.
**366.** *Standard Specifications for Cut Stone Work.* This is Vol. III, Series "A-3," Service publications on Indiana Limestone, containing Specifications and Supplementary Data, relating to best methods of specifying and using this stone for all building purposes. This valuable work is not for general distribution. It can be obtained only from a Field Representative of the Association or through direct request from architect written on his letter head. 56 pp. Ill. 8½ x 11 in.

**National Building Granite Quarries Asso., Inc.,** 31 State Street, Boston, Mass.
**416.** *Architectural Granite No. I of the Granite Series.* This booklet contains descriptions of various granites used for building purposes; surface finishes and how obtained; profiles of moldings and how to estimate cost; typical details; complete specifications and 19 plates in colors of granite from various quarries. 16 pp. Ill. 8½ x 11 in.

**STORE FRONTS**

**Detroit Show Case Co.,** Detroit, Mich.
**77.** *Designs.* A booklet. Store fronts and display window designs, giving plans and elevations, and descriptions. Size 9¼ x 12 in. 16 pp.
**78.** *Details.* Sheets of full size details of "Desco" awning transom bar covers, sill covers, side, head and jamb covers, ventilated hollow metal sash and profile of members. Size 16 x 21½ in. 3 sheets.

**The Kawneer Company,** Niles, Mich.
**467.** *A Collection of Successful Store Front Designs.* Illustrations of recently erected modern store fronts with all framing covered with solid copper. Maximum show window surface secured by these designs. Many classes of occupancy shown. 64 pp. Ill. 6¾ x 9¼ in.

**Zouri Drawn Metals Co.,** Chicago Heights, Ill.
**407.** *Architects' Catalog.* In addition to general descriptive matter this catalog contains a true copy of the approval of the Underwriter's Laboratories and a proper glazing specification, based on the Underwriter's report. 88 pp. Ill. 8¾x 11¾ in.

**STOVES**

**New Process Stove Co., Division of American Stove Co.,** 4301 Perkins Ave., Cleveland, Ohio.
**457.** *Catalog No.* 145. A complete catalog of gas ranges from a single cover hot plate to the most elaborate hotel range. Also lists gas heaters for rooms. 110 pp. Ill. 7 x 10 in.

**Reliable Stove Company, Division of American Stove Co.,** Cleveland, Ohio.
**460** *Reliable Angleiron Gas Ranges.* A pamphlet illustrating hot plates, laundry stoves and a complete line of gas cooking stoves and ranges equipped with the Lorain Oven Heat Regulator. 8 pp. Ill. 8 x 11 in.

**STUCCO BASE**

**The Bishopric Manufacturing Company,** Cincinnati, Ohio.
**451.** *Bishopric for All Time and Clime.* A booklet describing Bishopric materials; giving building data, detail drawings and specifications. Illustrated with half tones from photographs of houses built of Bishopric materials. 52 pp. Ill. 8 x 10½ in.

**STUCCO—See also Cement**

**American Magnesia Products Company,** 5730 Roosevelt Road, Chicago, Ill.
**284.** *The Stucco Beautiful.* A booklet describing Kragstone Stucco with pictures of buildings on which it has been used. 12 pp. Ill. 4 x 9 in.

**The Atlas Portland Cement Co.,** 25 Broadway, New York, N. Y.
**280.** *The Stucco House.* Contains many beautiful illustrations of houses finished with stucco and selected particularly for their architectural value. Detailed illustrations of stucco surface textures and drawings showing wall construction with revised specifications covering application of stucco. 96 pp. 8½ x 11 in. Price 50 cents.

**National Kellastone Company,** 155 East Superior St., Chicago, Ill.
**302.** *Specifications for Stucco Work.* A booklet containing complete specifications in detail for the use of Kellastone stucco for new buildings as well as the "overcoating" of old buildings. 13 sheets of text, 2 sheets of illustrations. 8 x 11 in.
**303.** *The Story of Kellastone Imperishable Stucco.* In this most interesting book the merits of Kellastone are set forth in a convincing manner. Every page contains pictures of beautiful houses stuccoed with Kellastone and there are two pages in color. 22 pp. Ill. 8½ x 12 in.

**TELEPHONES**

**Federal Telephone & Telegraph Co.,** Buffalo, N. Y.
**344.** *Federal Apartment House Telephones.* A short illustrated description of four classes of telephone equipment for apartment houses; Vestibules, the Suites, Rear Entrance, and the Janitor's Headquarters. 6 pp. Ill. in colors. 4 x 8 in.
**345.** *Interior Telephone Systems. Bulletin No.* 610. A detailed description of Selective Talking and Ringing Systems and Multiple Talking Systems of telephones for all kinds of establishments, from the most simple to those working on exchange trunks and central stations. 22 pp. Ill. 8¼ x 10 in.

**Stromberg-Carlson Telephone Mfg. Co.,** Rochester, New York.
**304.** *Inter-Communicating Telephone Systems. Bulletin No.* 1017. A pamphlet giving just the information required for the installation of intercommunicating systems from 2 to 32 stations capacity. 15 pp. Ill. 7¾ x 10 in.

**TERRA COTTA**

**Atlantic Terra Cotta Company,** 350 Madison Ave., New York, N. Y.
**425.** *Questions Answered.* A brief but full description of Atlantic Terra Cotta and its use in buildings. 32 pp. Ill. 5½ x 7 in.
**426.** *Booklets on Buildings.* A series of booklets describing terra cotta work for buildings of different kinds. In applying, mention size, type and purpose of building for which data is wanted.

**National Terra Cotta Society,** One Madison Ave., New York, N. Y.
**157.** *Terra Cotta Defined. Brochure Series, Vol. VI.* Illustrated brochure with photographic illustrations of architectural terra cotta, details of terra cotta ornament in office-buildings, theatre, bank, school, store, and public building. Its adaptability and lasting qualities are given and the process of manufacture and history is briefly outlined. Size 8½ x 11 in. 32 pp.

# REFERENCE LIST OF BUSINESS LITERATURE—Continued

**TERRA COTTA**

**National Terra Cotta Society**, One Madison Ave., New York, N. Y.

445 *Present Day Schools. Brochure Series. Vol. I.* The use of terra cotta for schools is exemplified in the presentation of 42 schools in the East, the Middle West and Far West, together with a discussion of "Some General Points on School Buildings" by James O. Betelle, A. I. A. 32 pp. Ill. 8½ x 11 in.

446. *Better Banks. Brochure Series. Vol. IV.* Illustrations are given of handsome appearing banks in many states, showing the application of terra cotta, with an article on "Terra Cotta for Banks" by Alfred C. Bossom, architect. 32 pp. Ill. 8½ x 11 in.

**The Northwestern Terra Cotta Co.**, 2525 Clybourn Ave., Chicago, Ill.

96. *Architectural Terra Cotta.* A collected set of advertisements in a book, giving examples of architectural terra cotta, ornamental designs and illustrations of examples of facades, of moving picture houses, office buildings, shops, vestibules and corridors in which Northwestern Terra Cotta was used. Size 8½ x 11 in. 78 pp.

**TILE—Ornamental**

**The Associated Tile Manufacturers**, Beaver Falls, Pa.

259. *Basic Information on Tiles.* Book giving practical information on ingredients, processes, gradings, sizes, shapes, colors, finishes and nomenclature. Sent to architects on request. 7½ x 10⅝ in.

358. *Home Suggestions.* A new book in colors describing and illustrating the use of tiles in floors, walls, ceilings, fireplaces, garages, for exterior embellishment, etc. Full of suggestions. Sent to architects on request. 7½ x 10⅝ in.

374. *Basic Specifications for Tilework and Related Documents. No. K-300.* This specification is prepared in a very systematic manner for the use of architects and builders. It is printed on one side of a sheet with facing page blank to receive memoranda. Various colored sheets make reference easy and simplify greatly the work of a specification writer in specifying tilework. 38 pp. 7½ x 10⅝ in.

375. *"Work Sheets" for Specification Writers.* To be used in connection with "Basic Specification for Tilework and Related Documents." 16 sheets 7½ x 10⅝ in.

**TIME CLOCKS—See Clocks**

**TREADS, SAFETY**

**American Abrasive Metals Co.**, 60 Church St., New York, N. Y.

383. *A New Safety Tread.* A folder announcing the perfecting of a process whereby aluminum is used as the abrasive-holding base, or matrix, in a new safety tread for locations where this detail may be ornamental. Ill. 8½ x 11 in.

**American Mason Safety Tread Company**, 47 Ferry St., Lowell, Mass.

462. *Mason Safety Treads.* Booklet showing general construction, methods of attachment. and buildings in which they are used. Methods of repairing old stairways fully explained and illustrated. 20 pp. Ill. 5½ x 8¼ in.

**TRIM—See also Doors and Windows**

**TRUSSES—See Building Construction**

**VACUUM CLEANERS**

**Landers, Frary & Clark**, Connersville, Ind.

299. *General Catalogue.* This book describes and illustrates Connersville vacuum cleaners, stationary and portable, dry and centrifugal separating units, sizes of machines, uses and typical installations. 24 pp. Ill. 6¾ x 9 in.

**VARNISH—See Paints**

**VENTILATORS**

**The Automatic Ventilator Co.**, 1003-5 Park Ave., Baltimore, Md.

393. *Automatic Ventilators.* A pamphlet exhibiting the principle of the Automatic Ventilator. Shows how "It makes your room breathe" and gives methods for installing in windows of various types. 8 pp. Ill. 3½ x 6 in.

394. *Architects' Bulletin.* A folder with margin indexed for filing. Contains detailed drawings of window and wall type ventilators, showing installations in windows, walls, steel factory sash, etc. Shows also roof type ventilators. 4 pp. Ill. 8½ x 11 in.

**The Burt Manufacturing Co.**, Akron, Ohio.

207. *General Catalogue* covering entire line of Ventilators, Exhaust Heads and Filters. Separate leaflets on each type of ventilator, vent and damper.

**VENTILATION—See Heating and Ventilation**

**WALL COVERING**

**Standard Textile Products Co.**, 320 Broadway, New York, N. Y.

111. *Sanitas, Modern Wall Covering.* Folio. Plates of color renderings of various interiors, with suggestions for the library, living room, dining room, boudoir, kitchen and church wall covering, using Sanitas. Size 11½ x 6 in. 15 plates.

112. *Sanitas and Its Uses.* Booklet. Text and color illustrations of Sanitas as a wall covering, with tables for wall and ceiling measurements. Notes on sanitary character, cleanliness and durability of Sanitas. Size 5 x 7 in. 28 pp. 6 color plates and 2 sample sheets.

**Standard Textile Products Co.**, 320 Broadway, New York, N. Y.

113. *Sanalining Sanitas Lining and Prepared Lining.* Folder. Notes on durability and cleanly character of the above three products. Size 3¾ x 6 in.

114. *Hints to Decorators.* Booklet. Instructions and specifications for the application of Sanitas, with notes on finishes and material. Size 5 x 6¾ in. 20 pp.

**WATER HEATER**

**Humphrey Co.**, Kalamazoo, Mich.

50. *Humphrey Gas Water Heaters.* Catalog and handbook. Diagrams, tables and complete data for specifying gas water heaters of all types and sizes. Size 6 x 9 in. 36 pp.

**WATERPROOFING—See also Dampproofing**

**A. C. Horn Company**, Horn Building, Long Island City, N. Y.

301. *Architect's Set.* A file folder, ready labelled for inclusion in the files, containing a full set of literature on all Horn Waterproofings, Dampproofing and Technical Paints. Descriptive Chart giving covering capacities, etc., printed on inside of folder.

**Minwax Company, Inc.**, 18 East 41st St., New York, N. Y.

327. *Sub-level Waterproofing. Bulletin* 21. Contains a discussion of waterproofing methods as applied to sub-level and bridge deck work. Information is given on the MINWAX System with specifications. 24 pp. Ill. 8½ x 11 in.

328. *Waterproofing Exposed Walls.* Discussion of wall protection methods. Full information on MINWAX Clear Waterproofing; Minwax Brick and Cement Coating; MINWAX No. 300 Dampproofing. 12 pp. 8½ x 11 in.

**The Truscon Laboratories**, Detroit, Mich.

238. *Architects' Specification Hand-Book.* Contains specifications on waterproofing methods, dampproofing, concrete floor hardeners, wood floor preservatives, technical paints and enamels. 33 sheets. Ill. 8½ x 11 in.

239. *Dampproofing.* Booklet giving specifications on black dampproofings, including Plaster Bond (dampproofing for interiors). Foundation Coat (dampproofing under each filling) and Stone Backing (dampproofing unexposed sides of cut stone). 12 pp. Ill. 6¼ x 7¼ in.

**Wadsworth Howland & Co., Inc.**, Boston, Mass.

306. *Bay State Waterproofings.* Contains descriptions of and specifications for use of brick and cement coating, crack filler, below grade waterproofing, steel protective coating, cement floor filler and coating, clear waterproofing. 16 pp. Ill. 8 x 10½ in.

**WATER PURIFICATION**

**United States Ozone Co.**, Scottdale, Pa.

245. *Bulletin* 37. *Ozone Water Sterilizers.* Contains description of principles and mechanical design, results obtained and specifications covering construction. Complete outline of operation. Capacities from 100 to 1,000 gallons per hour.

246. *Bulletin* 39. *Swimming Pools.* Description and application of Ozone apparatus to Swimming Pools. This Bulletin completely covers the purification of swimming pool water and gives unique designs of swimming pool circulating systems.

**WATER SOFTENERS**

**The Permutit Company**, 440 Fourth Ave., New York.

105. *Permutit (Water Rectification Systems.)* Illustrated booklet. Describes all methods of softening water, including the original Zeolite process. For homes, hotels, apartment houses, swimming pools, laundries and industrial plants. Size 8½ x 11 in. 32 pp.

**WATER SUPPLY—See Pumps**

**WEATHER STRIPS**

**Chamberlin Metal Weather Strip Co.**, 107 Third Ave., Detroit, Mich.

F432. *Twenty-seven Years of Metal Weather Strips.* A practical treatise on various types of metal weather strips. Contains valuable tables and reports on tests by well-known testing engineers. 20 pp. Ill. 4 x 9 in.

**The Higgin Manufacturing Co.**, 5th and Washington Ave., Newport, Ky.

354. *Higgin All Metal Weather Strips.* A booklet of considerable value to architects and builders on the use of weather strips. Ask also for the companion book on "The Reason Why." Each booklet 12 pp. Ill. 6 x 9 in.

**WINDOWS—See Doors and Windows**

**Standard Comfort Window Corporation**, 426 Broome St., New York, N. Y.

405. A book describing a combination sliding and swinging sash which may be applied to new and old double hung windows, draft-free ventilation; maximum comfort; weather tight; takes all danger out of window washing. 12 pp. Ill. 6 x 9 in.

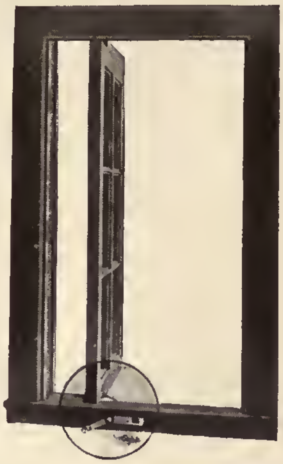
**WOODWORK**

**Hartmann-Sanders Company**, 6 East 39th St., New York, N. Y.

334. *Catalog No.* 47. Illustrating Koll's Patent Lock Joint wood stave columns for exterior and interior use. 48 pp. Ill. 7½ x 10 in.

# *Are you familiar with this type of window?*

*Looking in—Easily installed on any stock casement sash. Simple in design. Made of rust proof bronze.*



*Looking Out—Operated by a worm gear, turned by a small control lever. Cannot stick.*

Made possible by Carrier's Quadrant Adjuster. For use in public buildings, schools, hospitals, or residences where maximum ventilation, convenience and artistic effect are desirable.

Advantageous features of this type of window are—

1. Not necessary to move screens to open or close window.
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5. Both sides of window easily cleaned from within the room.

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*Sweet's and Architects' Samples Corporation, New York.*

*Residence at Asheville, N. C. Windows hung with Carrier Quadrant Adjuster.*

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**CARRIER ADJUSTER COMPANY**

*Casement Window Hardware*

**Asheville, North Carolina**


1


2


3

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BANKERS usually pride themselves on the permanence, strength, and dependability of their institutions. Perhaps this same pride is carried into their bank buildings for it is general for banks to be equipped, in every detail, with the finest and best.

The fact that Jenkins Valves are so universally selected for bank equipment is pertinently significant of Jenkins reputation and prestige. In every locality, in large and small bank buildings, you will find Jenkins Valves installed. The buildings shown here are typical of the many "Jenkins equipped" banks throughout the country.

(1) Dime Savings Bank Bldg., Detroit, Mich.—D. H. Burnham and Company, Architects.

(2) Bankers' Building, Boston, Mass.—Clinton J. Warren, Architect.

(3) Hibernia Bank Bldg., New Orleans, La.—Favrot and Livaudais, Architects.

(4) Broad Street National Bank, Philadelphia, Pa. —Paul A. Davis, 3rd, Architect.

Avoid imitations and substitutions by writing genuine Jenkins "Diamond Marked" Valves into your specifications.

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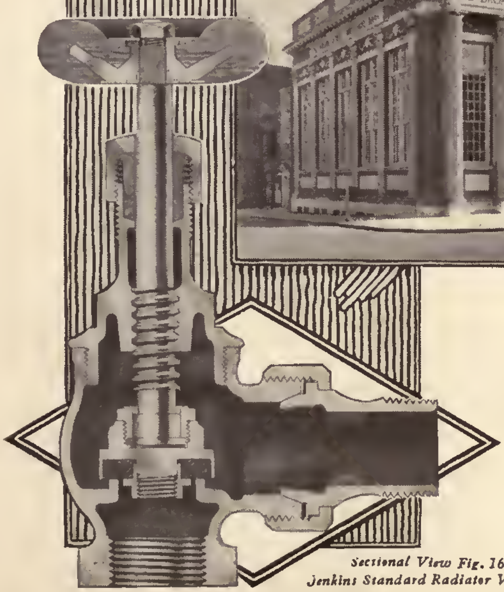

*Sectional View Fig. 168.*
*Jenkins Standard Radiator Valve.*

REG. U.S. PAT. OFF. TRADE JENKINS MARK

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JENKINS BROS.

New York, London — Boston — Philadelphia — Chicago, Montreal

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## "COPPER ROOFING"

A Manual of Up-to-Date Practise
in the Erection of Copper Roofs,
Copper Flashings, Copper Gutters,
Copper Leaders. etc.

PROVIDING for the architect a convenient reference to the latest and best practise in the application of Copper in the roofing and roof - drainage uses of the Everlasting Metal, "Copper Roofing" fills a long-felt need.

Proper methods for the erection of Copper are given. There are a number of full-page illustrations showing the Copper roof applied to various types of buildings. And, wherever it has been thought helpful, the text has been illustrated with figures.

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*We are anxious that every architect, engineer and contractor interested shall have a copy of "Copper Roofing," and will send a copy promptly on request. There is of course no charge.*

### TABLE OF CONTENTS



## COPPER AND BRASS
RESEARCH ASSOCIATION
25 Broadway, New York

# Modern Practical Floors for the Hospital

FLOORS of *Gold-Seal* Battleship Linoleum are particularly suitable for hospitals. They present no cracks or crevices in which dirt and dust may lodge. The firm, non-absorbent surface can be kept sanitary and spotlessly clean with little trouble. As a result the cost of cleaning is low.

And these floors are extremely durable. They can be counted on to wear for many years—to remain as smooth as the day they were installed.

They are a comfort for the hospital staff. The body of finely ground cork provides a pleasing resiliency underfoot and deadens the sound of footsteps.

*Gold-Seal* Battleship Linoleum is made strictly according to the U. S. Navy Specifications drawn up to insure the highest possible durability for linoleum used on the decks of U. S. battleships. Under the comparatively light wear given hospital floors it gives almost unlimited service.

### *A Definite Guarantee*

Every yard of *Gold-Seal* Battleship Linoleum is guaranteed to give satisfaction. Every yard is protected by the Gold-Seal pledge, "Satisfaction Guaranteed or Your Money Back." You will find this Gold Seal pasted on the face of all genuine *Gold-Seal* floor-coverings.

If you will write to our nearest office, we shall be glad to send you samples and a copy of our Architectural Service Sheet on Linoleum. Also if you wish, copies of the Gold-Seal Specifications for Laying Battleship Linoleum and Cork Carpet.

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**CAUTION**

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This Gold Seal is your guide in getting Battleship Linoleum that comes up to the U. S. Navy Standard.

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GUARANTEE
SATISFACTION GUARANTEED OR YOUR MONEY BACK
REMOVE SEAL WITH DAMP CLOTH

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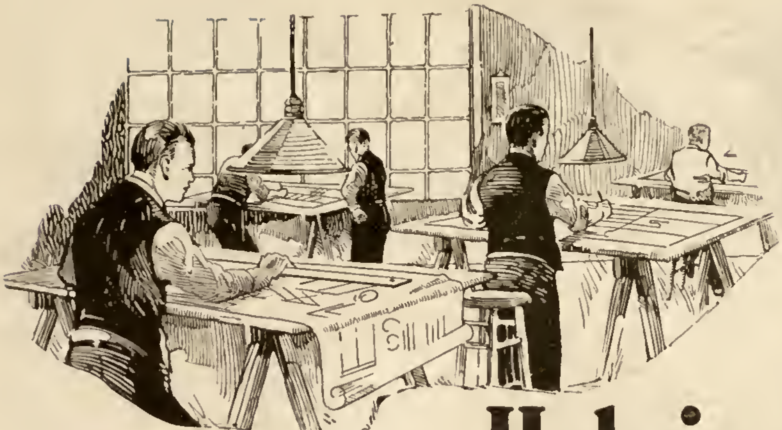
## Battleship Linoleum
(THE FAMOUS FARR & BAILEY BRAND)

Made According to U.S. Navy Standard



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Let us help you in the designing of difficult footings, columns, beams, trusses, etc., in preparing structural designs and shop drawings, or in consultation as to the most economical design for your building. Our preliminary estimates will help you in selecting the best design. Our recommendations incur no obligation.

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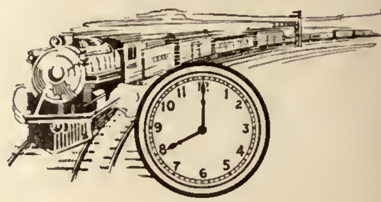

*Assisting You on the Job*

Better workmanship means better buildings. For years we have been installing reinforcing bars and spirals, Meyer Steelforms and Ceco Round Column Forms, erecting metal lath ceilings, partitions and difficult ornamental furring. Our men know how, for experience counts. We help you build as it should be built, promptly, efficiently and economically.

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CHICAGO - DETROIT - OMAHA - MILWAUKEE
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*Ceco* **PRODUCTS**
*for Permanent Building*
CONCRETE REINFORCING MATERIALS AND FORMWORK
FIREPROOF LATHING MATERIALS
METAL WEATHERSTRIPS
SHEET METAL TRIM AND COVERING PRODUCTS

High School, Austin, Minn.
G. L. Lockhart, Architect
Madsen Const. Co., Contractor

The walls of many of America's finest bank buildings are laid in Carney. The Federal Reserve Bank Building of Chicago is one of these buildings.

*Architects*: Graham, Anderson, Probst & Whit, Chicago.

*Contractors:* J. Griffiths & Son Co., Chicago.

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HOW can I lower the owner's building costs? Is that question in your mind when you write your plans? It can be answered by specifying Carney.

By writing Carney in your specifications you can materially cut building costs for your client. Furthermore, you build for the owner a wall of unequalled strength and durability.

When the contractor reads your specifications he knows that Carney will reduce his material and labor costs and thus enable him to submit a lower bid.

Material costs are less because the original cost of Carney is less. There is no lime to buy, for Carney requires no lime in mixing. There is no waste mortar. Left-over mortar can be used the next day by adding water. Soaking a barrel of neat cement makes a barrel and a half of putty without injuring the strength or durability of Carney. Thus Carney lays more brick per barrel.

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For your client's sake you should investigate Carney. Let us send you the Illustrated Carney Catalog.

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**Mankato, Minn.**

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*Specifications:* 1 part Carney, 3 parts sand; no lime

CARNEY'S CEMENT

The Bond That Guarantees The Wall

# CARNEY'S CEMENT

## *For Brick and Tile Mortar*

American National Bank Building
San Francisco

Metal Window-Frames and all sheet metal made of galvanized "Armco" Ingot Iron.

George W. Kelham, Architect.
Forderer Cornice Works,
Sheet Metal Contractor

**ARMCO**
TRADE MARK
**INGOT IRON**
**Resists Rust**

# On the necessity for commercially pure iron in OFFICE BUILDINGS

Wherever the metal will be exposed to air and moisture, an iron free from rust-promoting impurities should be used.

All window-frames and sash should be made of rust-resisting iron, all skylights, cornices, guttering, down-spouting, water-tanks, heating and ventilating ducts, metal lath, and metal partitions.

These are apt to suffer from premature corrosion if made of iron or steel containing the usual amount of impurities, and most of the iron and steel manufactured in commercial quantities does contain them to a harmful extent.

The impurities form spots which promote rust. The only way to prevent the formation of spots is to reduce the quantity of impurities to a small percentage.

"Armco" Ingot Iron resists rust because it contains less than one-fifth of one per cent of such impurities, not enough to form the objectionable spots. Service and laboratory tests prove that it outlasts steel of the same gauge and finish.

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Three-quarter view of assembled switch with plain toggle, and *Screwed-on* flush plate.

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## *For Fine Buildings*


CAST BRONZE
SCREWLESS
PLATES

Strong and simple mechanism, and easily installed.

Adjustable Aligning Lugs insure permanent alignment of plate with wall surface.

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If you wish, we will handle the entire contract from the turning up of the sod to turning on the heat. Or, furnish masonry plans, without charge, for a contractor of the architect's or owner's selection, and we simply handle the superstructure.

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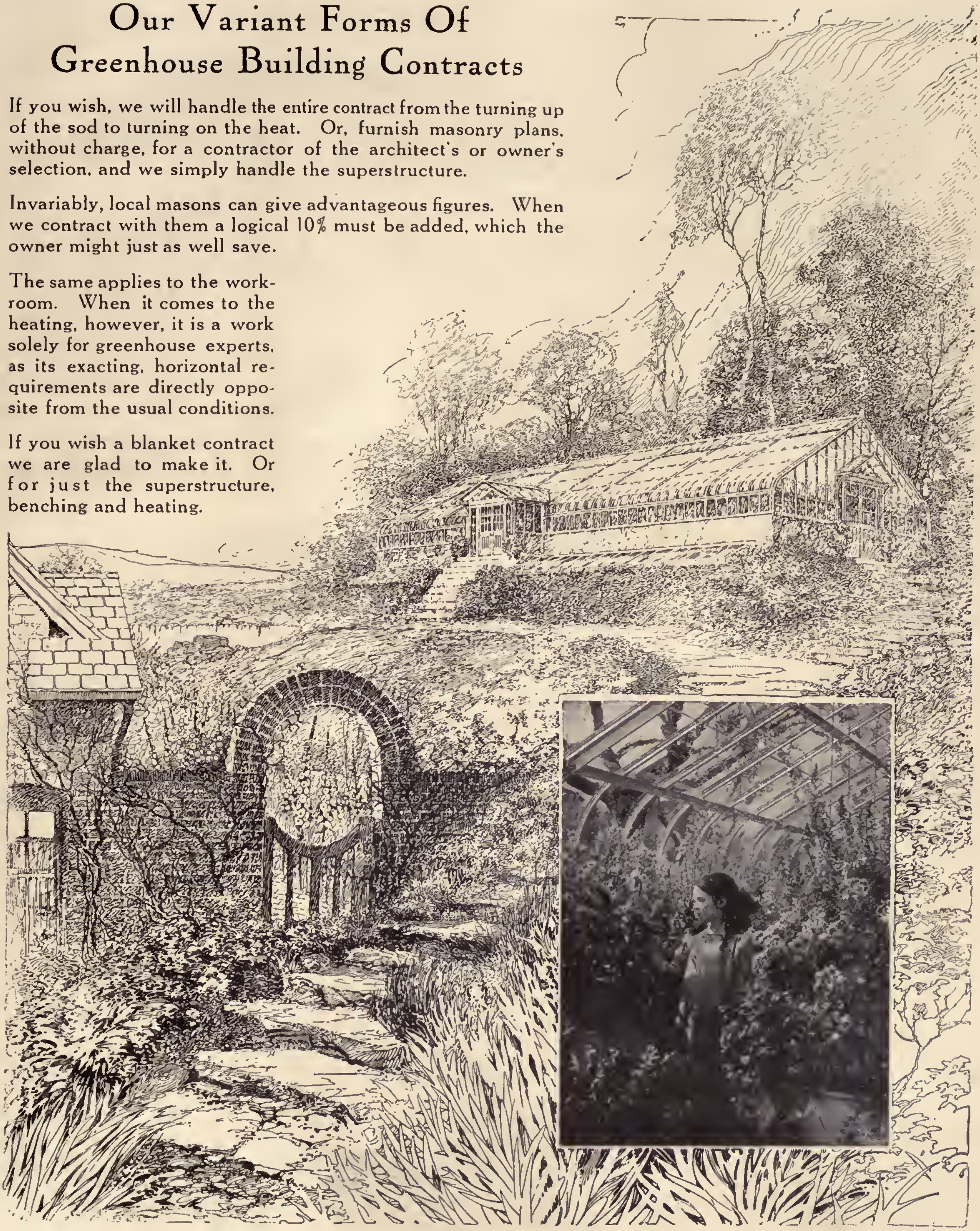
If you wish a blanket contract we are glad to make it. Or for just the superstructure, benching and heating.



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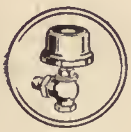

ROME Quality BRASS & COPPER

# "Rome Quality" at West Point

SENTINELS of the Hudson! The rugged lines of the buildings of West Point reflect permanence, which was one of the dominant ideas in their construction.

It is quite natural that *everlasting copper* was selected for the roofing of these buildings, for through the ages copper has been the choice of those who build for permanence.

"Rome Quality" sheet copper is used as roofing material for this group of Cadet barracks. "Rome Quality" was wisely chosen for its uniformity and the dependable service which its use assures.

Copper is endowed by native rust-resisting qualities. However, it must be more than mere copper, for its service is dependent on the method and care of its preparation. Rome Quality Copper is produced by the latest and most improved methods, many of which have been developed in the Rome Brass and Copper Company mills. Rome Quality Copper has behind it a manufacturing experience of over 55 years, and benefits by a long established policy and practice to produce only the best.

In specifying Rome Quality Sheet Copper for roofing, you are providing an ever dependable, lasting, and economical service.

BRASS-COPPER-BRONZE

***Sheets; rolls; rods; anodes; tubes, brazed and seamless; atrips; extruded shapes; angles and channels; tapered tubes and hose pipes; door rail; commutator bars and segments; electrical copper bar; and rivets and burs.***

ROME BRASS AND COPPER COMPANY—ROME, N.Y.

# BRASS ROME COPPER

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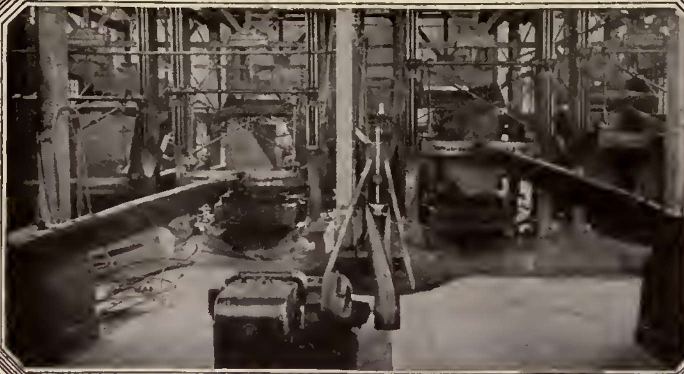
# MASTERPIECES IN MARBLE

SEE OUR CATALOGUE IN SWEET'S

*Gang Saws at Work in Our Mill at Knoxville, Tenn.*



*These Saws Are But Two of a Battery of 28 Operated in Our Plant*

Our plant is the largest in Tennessee. It covers seven acres. We operate 28 gang saws and have all of the other equipment necessary to turn out two carloads of finished marble a day.

We have built our business on volume. We have aimed to produce the best quality of marble at the lowest possible price. If you will submit plans and ask for estimates we will convince you that we have succeeded.

## APPALACHIAN MARBLE COMPANY

**KNOXVILLE TENNESSEE**

# COMBINATION BATH

## SEAT BATH, FOOT BATH, SHOWER BATH, CHILD'S BATH.


A new departure in the development of modern sanitary comforts—from the point of utility it promises to supersede, in many instances where space is at a premium, the ordinary bath tub.

This Combination Bath is neater and more pleasing than the average bath fixture and it is made of our famous AVON SEMI-VITREOUS PORCELAIN WARE, which is noted for its extra fine finish and great durability.

*The architect now planning apartment houses, bungalows, etc., will be interested in the special folders descriptive of this new bath.*

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**Wheeling, W. Va.**

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A. C. Shand, Chief Engineer,
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Concrete—stuccos, etc.—*expand* and *contract* MORE as a result of alternate wetting and drying than from temperature changes.

That this action—particularly the contraction or shrinkage—is a major cause of cracking and consequent disfigurement and deterioration—is scientifically proven by a recent investigation at the Engineering Experiment Station of the University of Illinois (Bulletin No. 126).

In their conclusions they state in part:

> "It is suggested that the prevention of shrinkage stress in concrete might be accomplished . . . by the use of a perfect waterproofing treatment." (Par. 8)

TRADE MINWAX MARK

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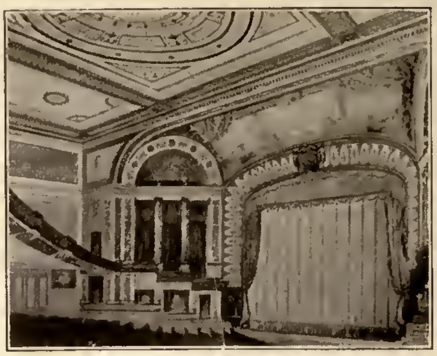

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A beautiful theatre is practical, only when its beauty can be maintained.

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**Built-in-the-Chimney**
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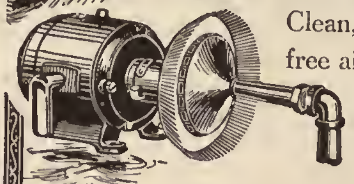

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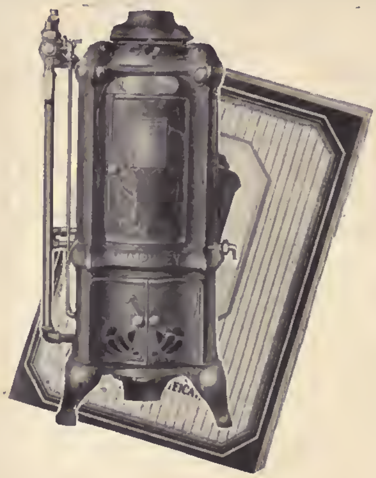

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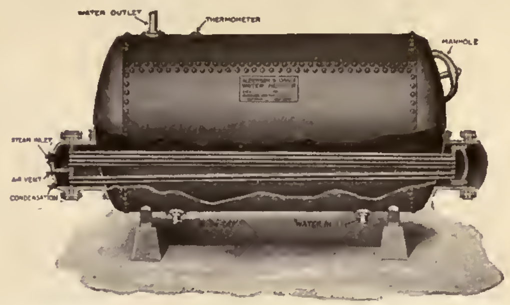


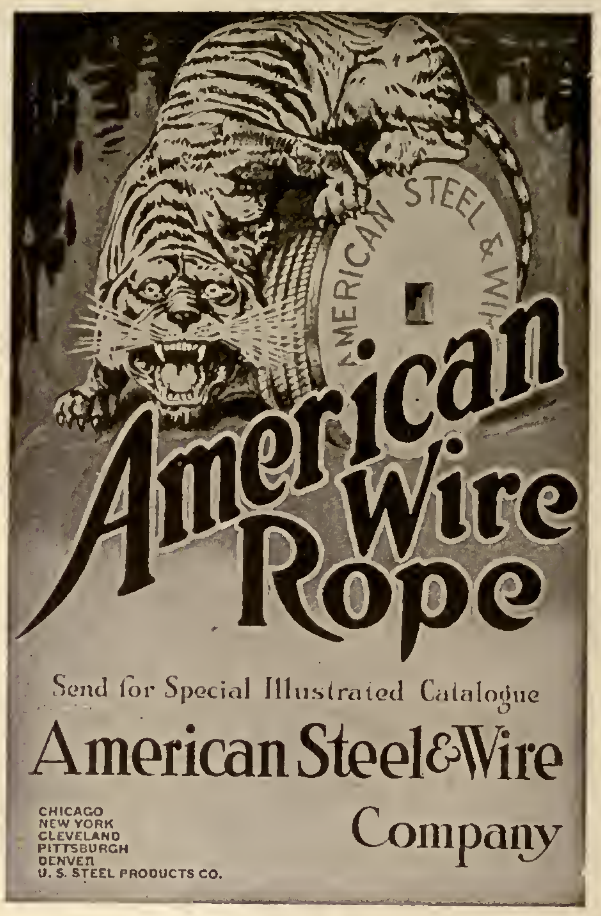


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Sweet's Index Page 1470

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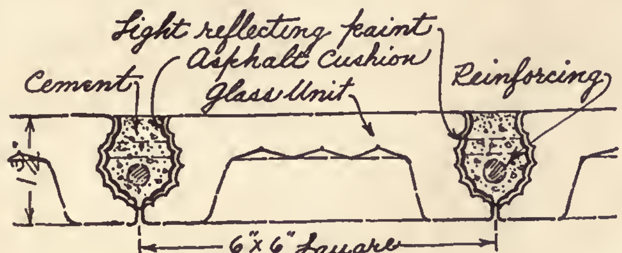


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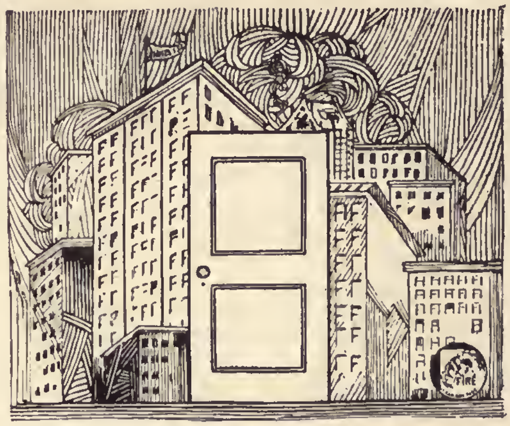

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NOTICE TO CONTRACTORS: Sealed proposals for Construction Work, Refrigeration Equipment, Sanitary and Electric Work, Addition to Store House for Cold Storage Plant and Equipment, at the Central Islip State Hospital, Central Islip, N. Y., will be received by the State Hospital Commission, Capitol, Albany, N. Y., until 2 o'clock P. M. (Standard Time), on Wednesday, June 28th, 1922, when they will be publicly opened and read. Proposals shall be enclosed in an envelope furnished by the State Architect, sealed and addressed, and shall be accompanied by a certified check in the sum of five per cent. (5%) of the amount of proposal. The contractor to whom the awards are made will be required to furnish surety company bond in the sum of fifty per cent. (50%) of the amount of contract within thirty (30) days after official notice of award of contract and in accordance with the terms of Specification Nos. 3679, 3681, 3682 and 3683, including Addenda No. 1, dated May 31, 1922, to each specification. The right is reserved to reject any or all bids. Drawings and specifications may be examined at the Central Islip State Hospital, Central Islip, N. Y., at the New York Office of the Department of Architecture, Room 1058, 25 Broadway, and at the Department of Architecture, Capitol, Albany, N. Y. Drawings, specifications and blank forms of proposal may be obtained at the Department of Architecture, Capitol, Albany, N. Y., upon reasonable notice to and in the discretion of the State Architect, L. F. Pilcher, Capitol, Albany, N. Y.

L. M. FARRINGTON,
*Secretary, State Hospital Commission.*

Dated: June 5, 1922. (2396)


*Third National Bank Building, Scranton, Pa. After being remodeled. Duckworth Brothers, Architects.*


*Third National Bank Building, Scranton. Before being remodeled.*

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# INDIANA LIMESTONE
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# INDEX TO ADVERTISERS

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