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ONE of the most melancholy events that we have ever been obliged to record is the death of the venerable Calvert Vaux, which occurred last week, in some manner not yet explained, his body having been found floating in the water at Bath Beach, N. Y., not far from the house of his son. To the older generation of architects, and persons of cultivated taste, the name of Calvert Vaux had been familiar for a long period; and it is difficult to realize that the man who shared with Downing the labor of preaching for the first time in this country the gospel of taste and beauty in connection with country-houses and country-estates would not have completed his seventy-first year until next month. Mr. Vaux was born in London, December 20, 1824. He was educated at the Merchant Tailors' School, and afterwards studied architecture under Lewis N. Cottingham, a noted practitioner in his day. At the age of twenty-four, he was selected by the famous Andrew Jackson Downing, the first of American landscape gardeners, and the founder of a school whose greatness is yet only half-appreciated, to assume the architectural part of the work which Downing had undertaken to do. From that time, until the death of the senior partner, the firm of Downing & Vaux stood at the head of the profession of landscape gardening and rural architecture in this country. They were employed by the United States Government to lay out the grounds of the Capitol and the Smithsonian Institution, at Washington, and executed countless private commissions in all parts of the country. When the project of creating a great park for New York was formed, competitive designs were invited, and Mr. Vaux, in connection with Mr. Olmsted, prepared the plan which was adopted and carried out. Mr. Vaux, whose part in the work was more particularly the architectural portion, retained his connection with the Central Park, as consulting landscape architect to the Department of Public Parks of New York, to the end of his life, the only serious attempt at superseding him having been defeated, a year or so ago, by the loyalty of Mr. Olmsted, who, when it was proposed to place him in sole charge of certain work for the Park Department, refused to have anything to do with it except as Mr. Vaux's coadjutor. By the time that the New York Park scheme was definitely settled, the people of Brooklyn desired to have a park also, and Vaux, Olmsted & Co. made designs, which were accepted and carried out, for the Prospect Park for that city. Later, the two artists designed the parks of Chicago and Buffalo, and the State Reservation at Niagara Falls, besides the Riverside and Morningside Parks in New York. Beside his more strictly landscape work, Mr. Vaux designed and carried out many buildings, public and private, in various parts of the country. On the dissolution of the formal connection between him and Mr. Olmsted, he associated with himself Mr. Withers, whose distinction as a designer of churches is well known to the profession; and afterwards Mr. Radford. Both Mr. Withers and Mr. Radford were Englishmen, and Mr. Vaux himself never forgot his own country or his compatriots. Of late years his son, Mr. Downing Vaux, and Mr. Samuel Parsons, Jr., have been associated with him. Personally, Mr. Vaux was extremely energetic and industrious, and devoted to his profession. Many of our readers must be familiar with his book, "*Villas and Cottages*," which formed a most satisfactory sequel to the renowned Downing books. Although he kept at work, his health had been feeble for some time, and it is supposed that in some momentary unconsciousness he fell from one of the piers near his son's house into the water.

FIRE AND WATER comments on the Manhattan Bank fire in New York, drawing conclusions very similar to our own, — that no one whose opinion is of any value can regard a structure of steel and brick of the modern sort, with slender supports and large openings, as anything but a more or less successful attempt at a building in which a fire, breaking out inside of it, can generally be confined to the room in which it originates. The principal reason for the comparatively feeble resistance of steel and iron structures to the heat of a fire is, it thinks, to be found in the fact that the metal beams and columns warp and twist when heated, throwing off their rigid casing, and destroying the walls and flooring of masonry in which they are inclosed. Like most of the suggestions which *Fire and Water* makes on such subjects, this one is worthy of thoughtful consideration. The newspaper reporters generally inform us that it is the "expansion" of the beams and columns which throws down the so-called "fireproof" buildings in case of a conflagration. This is manifestly absurd, as the masonry would expand so nearly at the same rate as the metal that there would be very little tendency to dislocation; but the warping, which takes place in structural steel under a comparatively slight degree of heat, is a very different affair. Every architect who has had much experience with structural steel knows that the pieces are rarely quite straight when delivered from the mill; and that punching, probably by releasing certain internal strains, usually causes angle-irons, or other pieces with a large number of rivet-holes in them, to bend still more; so that they must be forced into line with drift-pins and bolts before they can be riveted. Heating, again, often develops twists of various kinds; and it may well be imagined that a violent heat, applied to one side, or to a limited space, as would occur in the case of a fire, would cause such serious deformations as to throw off the fireproof casing, which is not often very firmly held to the metal. In view of the probability that some such action is the main source of danger where fires occur in so-called fireproof buildings, it is important to know whether it cannot be prevented, or its effects made less dangerous. Considering the great improvement made within the last decade in the manufacture of structural steel, which, from an uncertain, if not dangerous building-material, has become more uniform and reliable than iron, it is not too much to expect that American metallurgy may hereafter produce a steel as much better than that of the present day as the latter is better than that of 1885; but there is another direction in which improvement in structural methods may be made. We, like many other architects, have long regarded the present system of casing an elastic metal skeleton with a rigid covering of small pieces of brick, stone or terra-cotta, as illogical and unscientific. Of course, it has been imposed upon architects by the necessity, which is felt at the beginning of every transitional period, of making the new buildings look, on the outside, like the old ones, in order to avoid shocking the prejudices of the public; but all our professional readers know that, in modern structures, the masonry casing, whose bond, even under the most favorable circumstances, is cut to pieces by the steel-work inside, is, as a rule, a mere shell, from four to eight inches thick, clinging feebly, by means of anchors, to the steel structure that supports it, and ready to fall off by its own weight if any movement of the metal should incline it a little from its vertical position.

LOOKED at as a piece of scientific induction, this system is manifestly unsatisfactory. The essence of a riveted steel structure is elasticity and toughness. A railroad bridge is expected to deflect some inches under the weight of a heavy

train, and to recover itself after the train has passed; and, so long as the elastic limit of its materials is not exceeded, the integrity of the structure is not impaired. A modern steel building is put together in precisely the same way as a bridge, and the strains in it are provided for in just the same manner, yet an engineer who should decorate a railroad bridge with a casing of terra-cotta blocks, which would fall off under a deflection or sway far within the safe limit, would be looked upon as a fool; while an architect who proposed anything else than such materials for casing the very similar structures under his care would now be regarded as even more eccentric. A few years hence, as we believe, public opinion will change on this point; and elastic steel buildings will be decorated and protected by a covering as elastic as themselves, — one which will cling to them under all circumstances, which neither fire, water, warping, gravitation nor expansion can remove. A steel structure so covered will bear little resemblance to the Parthenon, or the Pitti Palace, or Giotto's Campanile, or anything at Ragusa, and the critics will have hard work in bringing their minds to bear upon it; but it seems to us that a system of this sort is the inevitable solution of the problem upon which architects, owners, underwriters and fire-engineers are now working — the invention of the best possible construction for city buildings on high-priced land. Concerning the nature of the elastic, fire-resisting and beautiful covering which is to clothe the steel skeletons of our future business buildings as the skin and muscles cover and protect our own bony structure, we will not venture any predictions. Our own observations have suggested that a wrapping of metal lath, plastered with cement, followed by an ornamental casing of copper, riveted on, and the whole grouted solid with lime and cement, might answer for the walls and columns, with a somewhat similar construction of wire-netting and concrete for the floors; but these details would be evolved by circumstances.

IT is with no small pleasure that we find ourselves appealed to for a word in support of the remonstrance which the artists, students of history and other thoughtful and sensible people are making in New Orleans against the destruction of the Cabildo, or Government House, once occupied by the Spanish Viceroy, who ruled over a territory which then comprised one-third of the present area of the United States, to make room for a new court-house. As a practical matter, the remonstrants say that the site, which is in the old quarter of the town, at some distance from the modern business section, is unsuitable for a court-house for the trial of civil cases; but that is a trifling consideration in comparison with the violence to the noblest of human sentiments which would be involved in the needless destruction of a building in which the great and romantic history of Louisiana and New Orleans is centred. Mr. Ruskin once wrote that he had often been invited to come to America, but that he had never been able to make up his mind to visit a country so miserable as to possess no castles. It is true that we have no castles, with their associations of violence and cruelty, but we have still many buildings connected with the history of the pure patriotism and heroic struggles through which was founded the greatest and freest commonwealth that the world has ever seen; and no lover of liberty would exchange Philadelphia's Independence Hall, or Boston's Old State-house, or the ruins of the Texan Alamo, for all the castles in Europe. Every year makes the historical buildings that we still possess more precious, and Americans, however lightly they may value the things which have so long been familiar to them, should not forget that they are the custodians, in behalf of the civilized world, of objects which centuries hence will be of as much interest to foreigners, as memorials of the English, Dutch, French and Spanish occupation of this country, as the Tower of London, or the tombs of the Norman kings, in England, or the Carlovingian monuments in France or Germany, or the ruins on the Palatine hill in Rome, are to us.

MR. B. TOMPKINS, of Pidmore, Chippenham, Wiltshire, England, writes to the *British Architect*, to mention a work of his, entitled "*The Theory of Water Finding and Metals*," just published and for sale by the author at one shilling per copy, and to give a little explanation of the details of water-finding by means of the divining-rod. As Mr. Tompkins says, there is much scepticism among intelligent people in regard to the operations of the divining-rod; and, as an evidence of a disinclination to credit the existence of phenomena which cannot be explained, he thinks this scepticism is laudable; but, according to his experience, the phenomena are so plain that they must be accepted as facts, whether we can at present explain them or not. As to the action of the divining-rod in his hands, he says that, when he is employed to find water, he simply walks over the ground to be investigated, holding in his hands the branches of a forked twig of whitethorn or hazel. If there is no water at an available depth, the rod does not move; but if there is a spring, or underground stream, he feels, in passing over it, a steady pressure on him, drawing him toward the earth, at the same time that the twig inclines in the direction of the spring. Following the indication of the rod, he reaches the point where the accumulation of underground water is largest, or nearest the surface; and here he finds the sensation of pressure on him stronger than before, while the twig, first standing upright, then inverts itself, with such force that, if he holds the ends of the branches firmly, they will be broken by the effort of the main stem to turn over and point downward. On testing the ground pointed out in this way, water has, in his experience, always been found.

WITHOUT saying that we entirely believe in the operation of the hazel rod, it is not necessary to assume that the holder of it must be possessed of necromantic powers in order to use it successfully. Nothing is more certain than that natural forces are in constant operation around us, which our senses are not delicate enough to perceive. The most rational theory that has been put forward to account for the unerring instinct by which bees, birds and larger animals find their way straight home from a distance, perhaps, of many hundred miles, suggests that the guide by which they steer their course is to be found in the magnetic currents which are constantly circulating around the earth in a north and south direction. The senses of animals are, in many respects, far more acute than those of men; and there is nothing incredible in the idea that birds and bees may feel these magnetic currents in such a way that they can use them as a compass, and steer, with their help, to whatever quarter they desire. Moreover, if animals can feel magnetic currents, there is no reason why men should not feel them also. That they do not feel them may be simply the result of want of attention to them. People soon lose the perception of things that they care nothing about; and, on the contrary, they rapidly gain in delicacy of perception in matters that interest them; so that it is by no means inconceivable that a person who walked day after day about the fields, with close attention to his own feelings, to see whether he perceived any unusual sensation at certain points, might learn to distinguish by feeling the influence which a good conductor of electricity, like a spring or underground stream, would undoubtedly have upon the electrical condition of the atmosphere above it. Every one knows the state of nervous tension which oppresses people before a thunder-storm, or any other violent atmospheric change; and, by paying attention to such feelings, their momentary recurrence, under certain circumstances, might easily be noted, and connected with the circumstances. In this way, it would not be very difficult to account for Mr. Tompkins's sensation of "pressure" in the vicinity of an underground spring; but the sensitiveness of the witch-hazel twig is not so easily explained. Here, however, the personal element does not enter into the question, and there ought to be no difficulty in arranging such a twig on a pivot, with a graduated arc and a balance spring, and conveying it to some known water-bearing tract, for the purpose of studying the force and direction of such attraction as might be exerted upon it. According to the testimony of Mr. Tompkins, and many other people, the force, whatever it may be, is great enough to break the twig, if it is not free to move. Such a force as this must be easy to measure, and the results of accurate measurements of it would be important. If the rod will only turn when held in the hands of one of the initiated, let the initiated attend at the test, and assist in the determination. There would be no difficulty about this, and it is really time that the divining-rod discovery, or delusion, should be brought out of the province of superstition, and made to show whether there is anything in it of scientific value. It should not be forgotten, also, that the real witch-hazel rod is reputed to point to subterraneous gold, as well as water; and its powers are quite as well worthy of investigation in this direction as in the other.

ART IN THE MODERN CHURCH.[1] — VII.

THE CHURCH TOWER.

Fig. 37.

THE tower is the chief dependence of the modern architect for giving a distinguishing and churchly aspect to his church building. He employs towers in other sorts of edifices, but the church is almost the only one in which its use has been practically agreed upon as essential. The tower has, therefore, a greater importance in church design than any other feature. Unfortunately this importance is not supported by the beauty of the designs that are produced under the modern system. It would appear that, if the tower must be the chief part of the church building — chief in being the most distinguishing and conspicuous feature — a very great excellence might be obtained for it. Our architects produce many very charming country houses because they are the form of work with which they are most familiar, and which most frequently offers itself for their professional treatment. If a tower is so important in the church building that scarce a church is built without one or more, it is not unreasonable to expect considerable success in their design, if, indeed, absolute supremacy is not obtained.

But every one who has studied modern church architecture is fully aware that this is not the case. The tower of the church is quite as likely to be as unsuccessful as the building itself, as numberless examples abundantly and sadly prove. The utmost our architects, as a whole, have accomplished with the tower is to make it picturesque.

But this, as we have seen, and as countless examples show, has nothing to do with religious design, though as churches are now built it appears to be considered as necessary to make the tower picturesque as any other part. This, of course, is consistent, since a picturesque design must be so in all its parts: it cannot be formed of diverse elements, and so long as this quality dominates American church architecture just so long may we expect towers that are picturesque, or which pretend to be — unhappily, not always the same thing.

Now the tower was in its origin a defensive structure, a lofty

Fig. 38.

building wherein one might find refuge from an assailant from without, and from whence one might successfully contend against a foe. The earliest church towers in Italy seem to suggest that this primitive meaning was retained in the early ages of Christianity, but this warlike and ungodly association disappeared with the progress of the church and with the development of Christian ideas. The church tower, however, remained, but instead of marking a formal

Fig. 39.

protest against the assaults of the outsider, it became a symbol and beacon of the church, telling the faithful as they approached the city that below it was the house of God, whose strength, security, beauty, was expressed in its tower as in the building of which it formed a part. It was under such a system that the church tower received its marvellous development in the Middle Ages, when it reached a perfection of form, a splendor of design and a wealth of art and beauty it never had before nor since. Set up to mark the loftiest and most precious possession of humanity — the idea of the personal God — it shows in a very marked and striking manner the heights to which architectural composition can be carried when it is animated by the most exalted feeling.

We have lost all that, as we have lost many another thing in our modern church design. Our churches have lost their godliness of aspect, and our towers, though still pointing heavenward, are mere ornaments, choice pieces of *bric-à-brac* as it were, stuck on to designs that, as likely as not, are sadly in need of brightening up. It is hardly possible to imagine a more complete degeneration than that which this once noble feature has experienced, and its downfall

Fig. 40.

has been the greater since, not being essential to the uses of the church, it has been thought so purely ornamental that every other possibility or meaning has been utterly forgotten.

We have already seen a number of church towers to which no Christian significance can be attached. They have not been added to the design because they expressed a Christian thought or illustrated a Christian virtue. In many of them no thought of dignity

[1] Although the author of this paper has drawn the greater part of his illustrations from designs that have appeared in this journal, he and we are under obligations for the remainder to the *Inland Architect*, the *Northwestern Architect* and to *Architecture and Building*. Continued from No. 1038, page 77.

has been hinted at. A general "prettiness" characterizes most of them; they are attempted ornaments, if not ornamental. It need hardly be said that towers designed as purely ornamental appendages to the church building must be very different in effect from those which aim to express the majesty of the church, or which set

Fig. 41.

forth the glory of God. When the architect puts away from himself the idea of godliness in building, his designs become purely secular products that might be classed as pagan if the idea of religion had not been entirely excluded from them at the outset. So our church towers, as a rule, simply illustrate so many individual ideas of the picturesque in building, and the more closely they approximate the picturesque, the better their misguided authors seem pleased.

In the church shown in Figure 28 we saw an instance of the exaggerated picturesqueness in church towers. A design somewhat similar to it is seen in Figure 37, a sketch for a suburban chapel, a design submitted in an architectural sketch-club competition. This is only a student's design, whereat we may rejoice greatly, since it has not been built, but that a young architect should imagine a design

Fig. 42.

like this to be suitable for a church is quite as alarming an indication of the general ideas concerning churches prevalent in this country as any actual building. The tower is certainly most eccentric, with its base of inclined arches, its narrow windows cut into the clock-face, its balcony and windmill head-piece. Its author has tried to produce a picturesque tower, and he has succeeded so far as to have drawn a design that does not resemble in the least any church tower previously designed, and which certainly has no message of Christianity to convey to those who may be privileged to gaze upon it.

Figure 38, a proposed country church, shows a less startling tower than the foregoing, but it is certainly not a religious tower, while it is difficult not to wonder why the stonework was stopped where it is, and why the curved cover was hoisted above onto a framework of wood. It is touches of meaningless fancy like this that so greatly injure our church architecture. This particular design is simple and not ineffective, but its sobriety is deliberately destroyed by the fanciful touches at the top of the tower. Thinking his business was to do

Fig. 43.

something with a note of the picturesque in it, the author took away all the religious character he had put into his design, not deliberately, perhaps, but as completely as though deliberately and of set purpose.

Figures 39, 40, 41, 42 illustrate four church towers which show us, as clearly as drawings can show, how very harmful such a feature may become in unguided hands: how godless it may seem when shorn of its religious character, how unnecessary to the church building, when it has lost its churchly significance; they really represent

Fig. 44.

a considerable geographical extent, and may be taken as types of average churches. There is nothing in common in these towers save their top-pieces which have a certain family likeness, though it is not probable that any one inspired the other. They are not unfair types of the hundreds of church towers annually built in America —

thoughtless, meaningless, stupid structures, with little beauty and with no purpose. Without art to commend them, without beauty, conferring no ornamental quality upon the structure to which they are attached, they nevertheless, for some strange reason, give a churchly air to the building in the eyes of their creators, and of our

Fig. 45.

good people generally. Apparently it is the idea of a tower that inspires respect and admiration in the modern mind. It cannot, if we judge from the examples before us, be their beauty nor their art. We are, therefore, reduced to the primitive idea of a heap of stone or of building-material, which still remains a heap, though its arrangement be more or less orderly, or approximate, as in the present examples, architectural form.

The church shown in Figure 43 might be considered from the effect of its towers, since the three of them form a dominating group. The central tower is manifestly a lantern and nothing more; it simply and naturally expresses what it is. No great fault can be found with it, save that, in the drawing, it appears too large and heavy for the building, while certainly much of the detail with which it is enriched will be lost in its position. Thus even in so simple a design the architect created two difficulties without solving either of them. The façade towers are not happy in their effect. The idea of a tall, stately, simple tower, capped with a rich frieze of ornament, with a crowning member above, is good in itself, but not as carried out here. The towers are intended solely as ornaments, yet they fail in that as completely as they fail to indicate a feeling of Christian reverence.

Figure 44 illustrates a Presbyterian church. It was built about fifteen years ago, and is, therefore, older than the designs we have been studying; yet its tower is a melancholy example of an architectural form not to be copied again, and which was unhappily invented for the present structure. The spirit that suggested this tower — a desire for ornamental effect — inspires most of the church towers of the present day. We may not build quite in this form, but the idea, the end aimed at, is the same. Our architects have improved their methods of architectural practice in the last decade and a half, they have given us purer detail and more careful, perhaps more scholarly, compositions, but we get little more of Christianity in our architecture.

If this tower exhibits a past type of the modern church tower, that shown in Figure 45 is surely of a very recent and up-to-date type. That we should have fashions in church towers is more unreasonable than fashions in the mode of dressing the hair of women. For one

Fig. 46.

is permanent and the other is temporary, and the one will last after the other has fallen out and wasted to decay. Yet the types of church tower in favor with us seems to vary and change with time in as unreasoning a way as the cut of a skirt or the twist of the hair. Sometimes we delude ourselves so far as to think that the strange things we do are expressive of our very modern age. Such, perhaps, might be claimed of the design before us, since no other epoch of time can boast a product like this. But if the tower is unlike any other tower, its modernity consists solely in this departure from established good usage. No other age could have produced a tower

Fig. 47.

like this, because in no other period of Christian time would so extraordinary a design have been tolerated. It does not correspond to any modern feeling, it does not express a modern conception of Christianity, it is put to no modern uses; only its strangeness of aspect gives it a modern flavor, yet being part of a Christian building it fails utterly in meeting the requirements of Christian art.

Yet is this true? Is this tower worse than any other tower? Is it the one structure to be singled out among thousands to be held up as the most unchurchly and the most un-Christian of them all? The towers of the church shown in Figure 46 and the two towers of the church shown in Figure 47, with most of the others we have seen, give negative replies to these questions. Not one of these is worse than another in a generic sense, since all are types of average buildings, whose unchurchly quality is most apparent when they are brought together for examination from the Christian point-of-view. It is just because such average work as these is tolerated, erected, aye, delighted in — since they are constantly being built — that the standard of our church architecture is so low, and the quality of its Christianity so slight. The Christianity of our modern American churches, in truth, is confined to the doctrines taught within them; the structures themselves tell us little of it.

In the Figure 47 we have a frontage of ample width, in which a great deal of room is consumed by the short clumsy towers which flank the centre. Apparently these towers are not intended to be carried higher, and thus they become purely ornamental appendages intended to give more or less beauty to the structure. How successful they are in this respect I may well leave others to decide, but

Fig. 48.

their un-Christian character will not be debated. They add nothing to the religious appearance of this building, and their large size, in comparison with the rest of the front, gives them an importance to which neither their art nor their utility entitles them.

These towers are examples of the unfortunate result that happens

when a tower is built too large, which is a frequent case when the architect, not knowing the Christian value and function of a tower, tries to produce an architectural effect with a feature that is not by nature intended to be used first for one purpose and then for

Fig. 49.

another. Figure 48, a "competitive design for a church," is another instance. As a whole, it is much superior to the preceding, but the author, in seeking a picturesque result, has placed a very large tower on a building of only tolerable dimensions. It illustrates the lack of a proper feeling for a tower, rather than any deliberate

Fig. 50.

architectural idiosyncracy. The tower is strong, simple, straightforward — all good qualities; its author, moreover, has resisted the temptation of introducing any especially striking feature under the delusion that it would add to the originality of his work. The essence of a good design is here, but the application is wrong. It was not designed as a Christian tower, but it was introduced because it made an affective group with the main portions of the building.

This study of towers may be concluded with a glance at the two competitive designs, Figures 49 and 50. Both are by the same architects, Figure 50 being an alternative design. They are introduced here not as illustrating any gross impropriety in church design, but because, being by the same authors, they hint, in a measure, at the mental processes through which an architect turns out a modern American church. The idea of the designers was obviously to obtain an effective group. One building is not more Christian than the other; one tower does not express a holier feeling than the other. Two different styles are chosen to meet the individual tastes of the committee of judges. But without undertaking to value these designs in their artistic quality, it is sufficient to point out that the Christian quality of architecture has been ignored in both. And that is what happens in most of our average church designs. Barr Ferree.

(To be continued.)

AMSTERDAM FIRE CONGRESS, 1895.[1] — II.

THE argument brought forward in Mr. Sachs's paper upon theatres was that good clear planning of theatres is of far greater importance to the audience than clever construction with certain doors of fire-resisting material, and further, that the regular attendance of fire-watches, day and night, more especially during the performances, is more essential than any amount of regular or even surprise inspection. The order in which he placed the importance of the subject with regard to the safety of the public, was that planning should come first, watching second, inspection third and construction last.

Mr. Sachs stated that it was not his intention to give a lecture, but simply to open a discussion. He did not wish to read a paper on modern theatre planning or construction, on fire-watches or theatre inspection, but simply to invite discussion on the relative merits of planning, construction, watching and inspection as far as the safety of theatre audiences was concerned, with the view of obtaining the opinion of the conference as to their order of precedence.

The opinion of the Congress if framed as a formal resolution would, he believed, be considered by all authorities entrusted with the safety of places of public amusement, and would greatly facilitate the abolition of some of the anomalies to be found in existing laws or regulations governing such premises; we all know how many serious theatre-fires we have had, the loss of life, and the lists of injured. We also know, though perhaps we scarcely realize the frequency, how often there are smaller fires at theatres of which the public, and even the authorities, hear little.

Theatre-fires have been almost identical in every country, both as regards to the outbreak, spread and result. Popularly expressed, the "fire fiend" has behaved everywhere in the same manner, and, taken as a whole, the kind of resistance offered him when once he appeared on the field has also been very much the same. Theatre-fires, as such, are generally too much for the local fire-brigade, and if there is any extensive life-saving necessary the means at the disposal of the authorities are usually quite inadequate to deal with such emergencies. Everywhere the theatre-fire has shown us that a combative policy alone would be of no avail. The results everywhere called for an energetic preventive, backed by a moderate combative policy.

Nearly every country has inaugurated a preventive policy. We have had, said Mr. Sachs, every kind of legislation conceivable for the protection of the public. There has been hysterical panic legislation, ponderous regulations in which every detail is defined by law, legislation which leaves practically everything at the discretion of an executive of experts, and regulations which are merely so by name and are a farce because they cannot be enforced. There is no uniformity in this legislation, not even in its elementary principles. If we read the regulations of the different countries consecutively with an idea of discovering what is really necessary, the result is most confusing. Some countries seem to consider good construction the essence of safety, whilst clear planning, watching or inspection are forgotten. Other countries give all attention to endless regular inspection, and omit the watching, others again require inspections only, others perhaps again good planning, construction, and ample inspection, but no watching.

Mr. Sachs pointed out that good planning in a theatre was of much greater importance to the audience than clever construction with certain powers of fire-resistance, and further, that the regular attendance of fire-watches day and night, and more especially during the performances, was more essential than any amount of regular or even surprise inspection. He went farther and considered the order of precedence to be:

1. Planning.
2. Watching.
3. Inspection.
4. Construction.

He also pointed out that he considered it the duty of the authorities to attend to the protection of life in the first place, and to the protection of property in the second. In speaking of property, he

[1] Continued from No. 1039, page 88.

considered the protection of adjoining property of greater importance than the theatre "risk" itself. As we all know how easily panic occurs without any fire, and how dangerous the rush of a frightened audience can be, the clear exit of ample dimensions with the simplest route was the safest, and perfect symmetry of plan of the most value. The prevention of a cause for panic was best guarded against, he said, by the constant presence of experienced and responsible firemen, who would on the one side see the possibilities of danger and prevent it, and on the other side be able to act smartly in case of an outbreak. He did not desire to disparage good construction or regular and surprise inspections, but believed the most careful regulations as to construction practically valueless so far as the safety of the audience was concerned, if the planning was not straightforward and responsible firemen not regularly in attendance. Theatres were built under the most varied circumstances, as there are National, Court, Municipal, Subscription and Subsidized Theatres, and theatres which are simply commercial enterprises. Mr. Sachs said that he did not consider it of such concern for the authorities to be satisfied that the building of a private or public owner would resist fire for a given time as that the public would be able to leave the premises easily and safely. Wooden stairs would, he believed, take them quite as quickly into the open as stone ones, and stone stairs with many windings and a complicated plan would be far more dangerous than wooden ones of straight flights of, say, fourteen steps each. Of course, good construction lessens the risk of an outbreak of fire, and one would always advocate good construction where unreasonable requirements were not made.

In Mr. Woodrow's paper, dealing with the action taken by the London County Council as to the protection of theatres from fire, he pointed out that this was a subject which had occupied much of the attention of the authorities of London during the past ten or fifteen years, and that a great deal of good work had been done during that period, under the auspices of the late Metropolitan Board of Works, and its successors, the present London County Council, in improving the existing structures and enforcing the better arrangements of all new buildings of this class. This work had been done, he said, with a view to the prevention and extinction of fires and the provision of the safety of the people frequenting places of public entertainment. Old buildings had been altered and many rebuilt, while new buildings had been erected under stringent regulations.

The control of the London theatres and music-halls, said the author of this paper, was under more than one authority, as to licensing and the enforcement of good conduct, namely, the Lord Chamberlain, the police and the London County Council, but the structural arrangements with regard to the prevention of fire were entirely under the supervision of the London County Council and its officials.

It was his duty, said Mr. Woodrow, some few years ago to prepare a draft of the regulations now in force for the consideration of the theatres committee of the Council, under the directions of the architect of the Council, Mr. Thomas Blashill, F. R. I. B. A., F. S. I.

The chief difficulty which the committee had to deal with was to form a regulation as to site, for so many extraneous circumstances had to be considered in framing a rule which, while protecting the public, would not make theatre-building prohibitive. London theatres are built by individuals or companies as investments to bring in a reasonable return for the outlay; there is no subsidy or State aid, the private purse alone being the source which can be drawn upon. Considering, therefore, that these buildings must be erected in the most crowded and fashionable quarters of the metropolis, where land is the most expensive, the committee felt it impossible to enforce the provision of an entirely isolated site, for the cost of such land would cripple all theatrical enterprises, give no new theatres and keep alive all the old ones. Therefore, the regulation, as it now stands, only asks for one-half the boundary of the site to be upon a public thoroughfare.

The committee were fully alive to the advantages of an isolated site and a symmetrical plan with exits arranged on either side of the house in corresponding positions, and in order to meet this requirement of safety as far as possible, a regulation was framed providing that two exits leading into different thoroughfares should be provided from each part or division of the audience. Now as it would not always be possible with only two thoroughfares to comply with this rule, a "way" or "private passage," 10 feet wide, was allowed on one side, and is accepted as suitable for the deliverance of exits in addition to the two thoroughfares.

The next feature of importance, considered by the committee in framing the regulations, was the construction of the theatre into three risks:

1. The auditorium, with two exits from each part.
2. The stage, with brick proscenium-wall passing through the roof, and fireproof curtain.
3. The dressing-rooms.

The regulations, as adopted, enforce that the dressing-rooms must form an entirely separate block with separate exits, quite apart from the "stage" exits.

No theatre is now permitted to be built in London under or over any other building or within a distance of 20 feet from overlooking windows in other property. The number of tiers is limited to three above the pit floor. The pit floor may be sunk below the street-level, but not more than 15 feet; on the other hand, it cannot be placed more than 6 inches above such level. The height between the tiers is defined as 10 feet between the pit and balcony ceiling, and 12 feet between the gallery and ceiling over. The number of exits, as already said, must, in all theatres built or added to in this metropolis, be two to every division of the audience, and the minimum width 4 feet 6 inches for each of the two exits to each division which contains not more than 400 persons. If any division of the audience exceeds in its seating capacity 400, then for every additional 100 (or part of 100) 6 inches more must be added to the width to each of the two exits.

400 would require 4 feet 6 inches,
500 would require 5 feet,
600 would require 5 feet 6 inches,

in width, and so on up to a maximum width of 9 feet. This rule applies to doorways, passages, staircases and corridors. Any passageway, staircase, etc., over 6 feet must be divided by a centre hand-rail. It is seldom, however, that this width is required, as the seating-capacity of any one division does not often exceed 700 persons.

Staircases must have steps of uniform tread and rise, and the flights must not exceed twelve steps or be less than three steps. No staircase may have more than two flights of twelve steps without a turn. The landings must be square and no winders are allowed.

The author did not touch upon the smaller regulations, as to hand-rails, width of gangways between the seats, wire coverings to sky-lights, protection of constructional ironwork, construction of walls with brick or stone, etc., but passed on to the other regulations referring to the disposition of the more dangerous parts of the building.

Workshops, store-rooms, wardrobes, painting-rooms are not allowed within the building proper; they must be separated from the theatre by brick walls and iron doors. The same rule applies to scene-stores as well as to lime-light rooms, gas-metre chambers, engine and dynamo rooms. This latter class of apartment must be fireproof throughout and perfectly ventilated.

With regard to the use of the lime-light the Council have lately given much supervision to the manner in which the gases should be stored and used and to the class of fittings that should be employed, for it has been found that the careless use of the lime-light is a most fruitful source of danger in a theatre. Most of the London theatres have during the past few years entirely discarded the lime-light and adopted the electric search-light instead, with the most satisfactory result, both with regard to safety and scenic effect.

The rules as to the gas and electric-light service are too detailed and complex to dwell on in full; they occupy some pages of the regulations and are purely technical. Separate gas-services and separate metres are required (1) for the entrances, (2) for the auditorium, (3) for the stage. A dual system of lighting with oil lamps is enforced for safety; gas and electricity are, however, accepted without any oil lamps as satisfactory.

Automatic fastenings, which give way upon the public pushing the door, are the only fastenings permitted on doors which are not left on the swing during the time the public are in the building.

The rules for ventilation include the provision of a smoke extract in the roof over the stage, and the manner in which the warming apparatus must be fitted up is set forth in full detail, which need not be described here.

With regard to the fire-extinction a plentiful supply of hydrants, with fittings of the same pattern as the Metropolitan Brigade, is chiefly depended upon. As a rule, two hydrants are required on each tier in the auditorium, one on each side of the various levels of the stage, besides others in the approaches, dressing-rooms and workshops. The usual provision for wet blankets, buckets full of water, hatchets, hooks and other appliances is insisted upon. Exit notices are of course required over all doors leading out of the theatre, and in addition to this, in many theatres the safety-lamps over the doors have "Exit" painted upon the glasses.

The construction of a theatre must, of course, be fireproof with regard to walls, floors, stairs, corridors, passages, but the regulations do not insist upon the tiers themselves being of fireproof construction. London architects, however, nearly always construct these of iron and concrete, on the cantilever principle.

The author, in conclusion, mentioned the manner in which these regulations were enforced by the Council. With regard to old theatres, the Council have power to compel structural alterations to be made where they deem it necessary for the prevention of fire and safety of the public. Although old theatres cannot be made to comply exactly with the regulations, the alterations required are generally based upon the principle of these regulations to make the old premises as nearly up-to-date as circumstances will allow. With regard to new theatres, plans have to be submitted for the examination of the Council's architects, who report to the committee as to whether the buildings when erected will comply with the regulations. If when finished all the regulations are complied with, then a certificate is issued, and the building when licensed is opened to the public. No building, however, is opened till the architect has certified its satisfactory completion in accordance with these regulations.

The duties of the Council's architects do not end with the examination and reporting upon plans, they periodically inspect and survey the structures both by day and night, and visit the premises when the public are witnessing the performances, to see that all the exits are free, the safety-lamps alight, the "panic" bolts in working

order and all doors ready to be opened with a push by the public themselves. These inspections are made sometimes unknown to the proprietors, the officer mixing with the audience, and paying for admission as one of the public, but at other times the survey is made in company with the manager of the theatre. All defects noted are reported to the theatre's committee of the Council, who having considered them, request the manager to remedy them forthwith.

There is, however, said Mr. Woodrow, no regular fire-brigade inspection enforced in London, and the Council feel to a great extent that this is a grave defect. There appear to be difficulties or want of parliamentary powers in the way of providing for the expenses of this inspection, which every one interested in the safety of the public and the protection of theatres from fire must wish to see promptly swept away.

ROUND ABOUT THE LONDON PICTURE GALLERIES.

A BEAUTIFUL portrait by M. Dagnan-Bouveret may be seen at the New Gallery in Regent Street. Small, but vigorous, superb in color and perfect in draughtsmanship, this little gem is worth a cart-load of the ordinary life-size portraits. Dark haired, with an olive complexion, and arrayed in a dull green coat, M. Paul von Stetten stands in front of a pinkish-white canvas, just primed and ready for use upon the easel. Behind this are a few touches of color — what you will — pictures, studies, *etceteras*, of the studio; formless touches which serve their purpose in bringing the composition into perfect harmony. It is the very perfection of painting — solid, rich and glowing, and each part put in with the deftest of touches. Next to this gem stands a lady in white — a profile, somewhat hard, relieved against a dark background. Light cuts the edge of the face and figure all the way down (it is a half length); but the light is brilliant and in the gown takes various reflections. Rather a supercilious smiling person is "Madame G."; but M. Courtois may be congratulated upon the success of the picture, which some persons might think was suggested by the Ingres portrait we all know so well, over in Paris.

M. Carolus-Duran's "Fritz-Thaulow" is a fine mass of color and a wonderful exhibition of strength in modelling, but there is a slight want of refinement in the treatment. Not so M. Carl von Stetten's "Gustave Courtois," which is not new — it figured in a *Salon* some years ago. Nothing could be more brilliant than this flesh painting; it seems to live and move as one looks at it. Near by is another old friend, painted years ago by Frederick Sandys, "Mrs. Lewis." Here is what used to be considered the perfection of finish — each vein, each wrinkle of the old lady's face; and a background such as Van Eyck would have loved — a mirror reflecting a lamp and knick-knacks upon a mantle-shelf, over and over again. This is crisply and freely painted; but the lady leaves much to be desired; it is hard and lifeless, and the knowledge of what to suppress, in which Van Eyck was supreme, is totally absent. This old lady is a mere puppet as compared to Dagnan-Bouveret's portrait. The Scotch School is well represented, but there is a want of completeness in their work — finish, considered in the light of leaving nothing to be desired, however sketchy the work may be. Mr. Abbey's pastels at the Fine Art Society's rooms in Bond Street, are an instance of this. They are all mere sketches, done in an hour or two; and yet, who wants them carried any farther? A few strokes gives one the impression of a lady drinking her tea; another is an exquisite harmony of color; a third is the perfection of drawing in the turn of a knee, or the fold of a coat. But Mr. Guthrie's portraits seem to want something more put into them, and give one the impression of being done from persons who were in a hurry to go away. Possibly few people now would sit for seven or eight consecutive days, mornings and evenings, and dine with the painter, as Sir Peter Lely told Mrs. Mary Beale was the wont of some of Van Dyck's sitters!

Mr. Whistler exhibits a dirty-faced gypsy, in a dingy red shawl — a clever sketch, but scarcely happily named "Crimson Note, Carmen," for one's idea of that impertinent baggage, the cigar-maker, is no more like this gloomy old woman than is the head-gear properly named crimson.

Mr. Watt's "Mrs. Edward Ellice" is in his best style. Pastel, as a sketching medium, is happily exampled in Mr. Llewellyn's vigorous work "A Sketch." We are frequently told that the new crayon work is not to be compared to the old; but when looking at Mr. Abbey's pastels, let us think for a moment of that dreary chamber in the Louvre, where, with the exception of Chardin's, we see a number of pretty imbecilities, with every touch softened off into a sort of powdered effect. In our modern work, each stroke tells, and not one is ashamed of being left as the crayon placed it. It is all fashion some will say. Possibly; but if the admiration of Velasquez is no new thing, if in oil painting we may see each stroke of the brush, if perfection in painting consists in the art of leaving out the unnecessary, and the knowledge of what to sacrifice and suppress, why should not a pastel sketch be done in like manner? Happily, the public is getting educated and does not measure perfection in art by the number of weeks spent over a picture. The clever physician gives you a diagnosis of your complaint in a few minutes; and so, likewise, the clever artist grasps his subject, and gives you the impression upon his mind in a few strokes of his brush.

Mr. Yellow-book Beardsley shows a portrait which seems to have strayed away from the advertisement-page of a newspaper; or is it one of those disagreeable cards (possibly advertising rocking-horses) which we find when we turn over the pages of a magazine? A good deal is suppressed in this person's drawings, which, of course, as we have said, is one element of perfection in art; but possibly still further sacrifice, or the total suppression of this type of beauty, would not cause much lamentation and weeping amongst the votaries of true art.

S. Beale.

STUDY OF THE HISTORY OF ARCHITECTURE.

AS an *addendum* to the Report of the Committee on Education to the Convention of the American Institute of Architects at St. Louis, Mr. Van Brunt read more or less of the following extract from a paper describing the methods by which the history of architecture is taught at Columbia College:

But these studies take little cognizance of what was the prime factor in the production of these works of art, the fertile and ingenious mind of the old workman himself; all the facts of his environment, which are so interesting to us, and which present themselves so conspicuously to our minds as the main elements of the situation, were to him simple matters-of-course. He did not think of them. They had not part in the reasoning which determined his action, an action which was determined, as we may believe, not by any process of reasoning from recognized principles, but by simple considerations of good sense and good taste. Of most of the influences which seem to us to have been so powerful he was as unconscious as of the air he breathed, and the rest he felt only as he recognized the limitations of the conditions under which he worked. Even the logical and æsthetic principles which underlay his work and, as we can see, largely controlled it, were for the most part, as always happens with the skilful workman, only half revealed to him.

It is by no means clear, indeed, how far these considerations entered, even unconsciously, into the mind of the designer. It is easy to over-estimate their real influence and to overlook the fact that what is really the most potent agency in determining the form of a work of art is the purely artistic consideration of grace of line and harmony of proportion, and that these are the same in all ages and under all conditions. It is difficult to enter into the feelings of antiquity or of the Middle Ages in regard to religion, government, society and natural science. The modern man is a different creature from the man of that day in all these relations. But the artists of all ages are brothers of the same family. While accordingly it is difficult to make the study of history of practical service in those fields, it being hardly possible to understand the conditions well enough to glean from them examples pertinent to our own needs, the history of art is more intelligible and more serviceable. Its monuments, if studied from the point-of-view of the men who made them, are full of meaning, and that point-of-view is not altogether impossible of attainment. If this were not so, the study of architectural history would have no more place in a school of architectural design than has the study of archæology. It would be curious and interesting, but of no immediate service.

For what occupied the attention of the architects of those times was, as has been said, the single question how to do the work in hand in a sensible and agreeable manner. The way for us to understand why they answered this question in the way they did, and thus to enter into the real understanding of the results, is to put ourselves as far as possible into their place and to set before ourselves not their achievements, as examples to be classified, arranged and comprehended, but the problem they had to solve and the conditions which controlled their solution of it.

It is in this aspect that historical architecture is presented to our students in their exercises in historical design. We exhibit to them the architecture of the past as a series of problems just as it appeared to the builders of its own day, and we hope thus not only to give them a clearer insight into the real spirit and character of the master-pieces that have come down to us, by bringing to view the ideas and considerations which really influenced their designers, but at the same time to exercise our own young men in the practical application of those same ideas. We hope thus to develop in them the same good sense and good taste, the same readiness of invention and happy ingenuity, to which these masterpieces are due.

The exercises themselves may be described as a species of design by description or by dictation. The attempt is made, by indicating the conditions under which a given piece of work was executed, to present to the student the same problem that the workman of old was called upon to solve. The student can then compare his own solution of it with the one that has come down to him, thus receiving correction and guidance in his work from the hand of the master. It is plain that the special excellencies of the original monument are likely to reveal themselves with fresh distinctness, and to find special sympathy and appreciation in the mind of one who has striven, however unsuccessfully, to solve the same problem.

An example or two taken from widely different fields will suffice to illustrate this. In studying vaulting, we once got so far as to understand how oblong vaults were thrown across a nave, while square vaults covered the aisles. A class of fifteen or twenty students were then asked to find out how a semi-circular or polygonal apse could be added to a choir roofed on this system. In the course of a couple of hours' figuring I found that they had worked out, among them, all the five solutions of this problem, which in the Middle Ages it took one or two hundred years to develop. This was

very encouraging. At another time they were given a somewhat minute description of four pilaster capitals from Blois or Chambord, and they made thumb-nail sketches on the spot according to their interpretation of the description. The next day photographs and drawings of a dozen or twenty other such capitals were given them, so that they might understand the fashion of the time, and they were told to draw out their sketches on a larger scale. The result was fifteen or twenty sets of capitals, all showing the same four motives, but differing in a most interesting way according to the personal differences of taste and skill on the part of the designers.

On another occasion the First-year class, after their studies in Egyptian and Assyrian architecture, made a dozen or twenty restorations of Solomon's Temple, according to the description in the Book of Kings. The drawings they produced showed considerable fertility of invention, especially in the designs for Jachin and Boaz, and the whole series together seemed to be quite as creditable, and as reasonable, as most of those which have from time to time been put forth by the learned.

It is an obvious variation of these exercises, and a great extension of their usefulness, to let the students write the descriptions themselves, then exchange papers and interpret each other's papers as they best can. It constantly happens, when description and interpretation are both careful and scholarly, that the result looks like a copy of the photograph or drawing from which the dictation was made. It is surprising and instructive, indeed, to see how much of the spirit and charm of an original is preserved in spite of considerable changes of proportion and detail.

This practice in historical design we believe to be founded on sound theoretical principles. To regard a work of art as far as possible from the point-of-view of the artist is, indeed, the first principle of fair and intelligent criticism. To foster the individuality and personal initiative of a pupil by bringing authority to bear upon him in the way of correction at the end of his task, and guidance and suggestion at the beginning, rather than control during the course of the work, is the first principle of intelligent teaching. Moreover, the results, so far as we have gone, have justified the method. We have, indeed, employed it hitherto mainly as a matter of experiment, when favorable circumstances have suggested it. But every year we use it to a greater and greater extent, and it is gradually acquiring a recognized place as an integral portion of our work.

A considerable step in this direction was taken last winter when we undertook to apply this method of "Design by Dictation" to the study of the architecture of the Renaissance by the Second-year class. We began with doors and windows, giving out a list of the elements that entered into their composition — such as architrave, frieze and cornice, arches and imposts, pediments and pilasters, pedestals and balusters, consoles, brackets, modillions, sills and thresholds — forms with which they had already become familiar in the study of the Orders. They were told to design a dozen windows, ranging from the most simple they could conceive to the most complicated, making sketches in the class at as small a scale as possible, and drawing them out afterwards to a one-fourth-inch scale, approximately. These were criticised from the point-of-view of proportion and evidence, as they were studied with tracing-paper. As a second lesson, several examples of doors and windows from Létarouilly's Rome were dictated in detail, and the resulting interpretations compared with the originals. Finally, we were fortunate enough to discover that there was a certain type of doorway of which we could find no example; namely, a doorway furnished with large consoles, after the fashion of Vignola's classical example in the Church of San Damaso in the Cancellaria, but with a mutulary Doric frieze and entablature. This was a highly successful experiment. Half a dozen of the class devised forms of console quite in keeping with the triglyphs and mutules, thus adding, it would seem, a new feature to the resources of the Classical architect.

This was followed by similar exercises in the treatment of vaults and ceilings, of wall-surfaces, external and internal, of spires, stairways, and others of the larger features. All this was in preparation for the problems in Design which occupied the third and fourth years.

We are proposing to extend this method during the coming winter to still more elementary work, in the study of the Orders themselves, and to more advanced work, in the study of planning.

These exercises were, indeed, a part of the course in Design. But the principle is the same, and it can easily be applied, as the first cited examples have shown, to the study of the historical development of style. Every step in the evolution of Gothic architecture was taken by varying the procedure which at any moment happened to be in vogue, in accordance with some suggestion of improved construction of ornamentation. The most successful variations survived by a process of natural selection. It is perfectly practicable, as we found in the case of apsidal vaulting, for these same suggestions to be made to the student, so that he may tread in the precise footsteps of the Free-masons, forestalling, in fact, in his own experience, the revelations of the text-book. This "Design by Anticipation," as it may be called, will, we hope, come to play a valuable part in our strictly historical studies, as a sort of obligato accompaniment to the lectures on Architectural History, from the time of the Pharaos to that of the Georges.

The local peculiarities that distinguish the styles of France from those of Italy, and those of Spain from those of Germany and England, are obviously amenable to this treatment. It is, after all, merely a special application of the principle, that it is better for a student to find things out for himself than to be told them. The artist, whose function is a creative one, whose business it is to do original work, and to whom "imitation is suicide," — yet who must be well versed in the experience of his kind — profits greatly if he can gain this erudition in the exercise of his active and inventive powers, instead of assuming during the long time necessary of its acquisition a passive and merely receptive attitude. The architect, especially, is what the Greeks call the Poet, and what Chaucer calls him too, a *maker*.

It is not, of course, every student who can rise to the full height of this argument, although it is true, as Mr. Emerson contends, that every man may be a man of genius as far as he goes, and that whatever spark of originality he has, should be sacredly cherished. But some men at least, in every class, can profit by these exercises to the utmost, and these should not be deprived of this experience. Others may follow haltingly and may, after all, have to be shown what they have not the wit to discover. But they are no worse off if told things at last than they would have been if told them at first. Indeed, they are better off, for the sense of baffled endeavor makes one specially appreciative of assistance. The information comes, as a "felt want," to a mind disciplined to receive it. The main trouble in getting such men to receive new information is that they do not, in general, feel that they want it.

These four exercises, the Lectures on History and Ornament, with the study of English, French and German text-books, the Historical Research, the Historical Drawing and the Historical Design occupy a chief part of the student's time during the first three years of the course. At the end of the third year the stated instruction by recitations and the lectures is virtually finished, the fourth year being, by an arrangement, which is perhaps a novelty in places of learning, quite free from lectures or recitations. The men give their whole time by day to problems in design, to what may be called "*atelier* work," without interruption. Their evenings, throughout the whole year, are devoted to historical study. As the college library, including the Avery library, as well as the books and photographs belonging to the Department of Architecture, is accessible every evening until 11 o'clock, and the Metropolitan Museum is open twice a week until 10, every facility is afforded for the prosecution of this work. In order to make the most of these appliances, every student of the Fourth-year class and all the special students, (who are of similar grade, being received only in advanced standing,) prepares once a month, under the name of Advanced Architectural History, an original paper. This he illustrates by drawings and reads to the class. All this affords an almost unexampled opportunity for serious work.

Whether this long course of historical study and investigation, occupying a large portion of the student's time, during four years, will materially contribute to the result anticipated in the committee's report of last year, we do not know. We do not feel that it very much concerns us to know. We do not see that we have any call to map out the future, to cast its horoscope, or to attempt to influence events toward the issues that are indicated by any astrology that we can devise. We distrust the science which, in our present state of ignorance, undertakes to foretell or to control the architectural weather. All we can be sure of is that the architecture of the future will be good or bad, noble or ignoble, fair or foul, according to the personal character and professional prowess of the men who have it in hand. All we can do is, if possible, to inspire the young men who come under our hands, with a certain measure of good sense and good taste, teaching them by precept and by the example of history that in art, as in life, temperance and refinement of conduct come from firmness of mind and elevation of soul, and that these are the only sure means to those ends.

Here historical studies, pursued as we aim to pursue them, are of inestimable service. They not only train the active and artistic powers, but by giving, as we hope, a keener appreciation of the excellence of excellent things, refine the taste and fortify and confirm the judgment. They become the most efficient safeguard against the wild and wanton demonstrations which both in Europe and in this country have so often borne witness to the native force and vigor of an undisciplined and unchastened imagination.

THE GOVERNMENT TIMBER TESTS.

THE following Resolutions were adopted by the Association of Railway Superintendents of Bridges and Buildings at the Fifth Annual Convention, at New Orleans, La., October 15, 1895.

Whereas a most comprehensive and valuable series of investigations into the properties of wood and tests of the strength of our commercial timbers have been carried on in the Division of Forestry of the United States Department of Agriculture:

Whereas these investigations have already demonstrated that a most decided improvement in the practice with timber structures and use of wood and a saving of millions of dollars worth of wood material are attainable as a result of these investigations:

Be it Resolved, That we, the American International Association of Railway Superintendents of Bridges and Buildings, assembled in regular session at our Fifth Annual Convention, at New Orleans, La., October 15, 1895, endorse, as railroad officials in charge of the construction and maintenance of timber structures and buildings of railroads

throughout the United States, the work thus inaugurated by the United States Government as tending towards a most needful and rational economy of our forest resources and desirable improvements in their use, resulting not only in a great saving to users of timber throughout the country, but especially offering a valuable guarantee for the absolute safety of properly designed timber structures:

Resolved further, That we ask our Representatives in Congress to make liberal appropriations for the continuance and more rapid advance of this work, in order to secure, as quickly as possible, the much needed information, believing that the Government alone is in a position to secure it and that it is true economy to provide it without delay:

Resolved further, That these resolutions be transmitted to the President of the Senate, the Speaker of the House of Representatives, the Secretary of Agriculture, the Chairman of the Committee on Agriculture of the Senate and the Chairman of the Committee on Agriculture of the House of Representatives.

REPORT OF COMMITTEE ON "STRENGTH OF BRIDGE AND TRESTLE TIMBERS."

Your Committee appointed to report on "Strength of Bridge and Trestle Timbers," with special reference to southern yellow pine, white pine, fir and oak, desires to present herewith, as part of their report, the very valuable data, compiled by the Chairman of the Committee, relative to tests of the principal American bridge and trestle timbers and the recommendations of the leading authorities on the subject of strength of timber during the last twenty-five years, embodied in the appendix to this report and tabulated for easy reference in the accompanying tables, I to IV.

The uncertainty of our knowledge relative to the strength of timber is clearly demonstrated after a perusal of this information, and emphasizes, better than long dissertations on the subject, the necessity for more extensive, thorough and reliable series of tests, conducted on a truly scientific basis, approximating as nearly as possible actual conditions encountered in practice.

The wide range of values recommended by the various recognized authorities is to be regretted, especially so when undue influence has been attributed by them in their deductions to isolated tests of small-size specimens, not only limited in number, but specially defective in not having noted and recorded properly the exact species of each specimen tested, its origin, condition, quality, degree of seasoning, method of testing, etc.

The fact has been proved beyond dispute that small-size-specimen tests give much larger average results than full-size tests, owing to the greater freedom of small selected test-pieces from blemishes and imperfections, and their being, as a rule, comparatively drier and better seasoned than full-size sticks. The exact increase, as shown by tests and by statements of different authorities, is from 10 to over 100 per cent.

Great credit is due to such investigators and experimenters as Profs. G. Lanza, J. B. Johnson, H. T. Bovey, G. B. Wing, and Messrs. Onward Bates, W. H. Finley, C. B. Talbot and others, for their experimental work and agitation in favor of full-size tests. Professors G. Lanza, R. H. Thurston and Wm. H. Burr have contributed valuable treatises on the subject of strength of timber. The extensive series of small and full-size United States Government tests, conducted in 1880 to 1882 at the Watertown Arsenal, under Col. T. T. S. Laidley, and more recently the very elaborate and thorough timber tests being conducted by the United States Forestry Division under Dr. B. E. Fernow, Chief, and Prof. J. B. Johnson, of Washington University, St. Louis, afford us to-day, in connection with the work of the above-mentioned experimenters, our most reliable data from a practical standpoint.

The test data at hand and the summary criticisms of leading authorities seem to indicate the general correctness of the following conclusions:

1. Of all structural materials used for bridges and trestles, timber is the most variable as to the properties and strength of different pieces classed as belonging to the same species, hence impossible to establish close and reliable limits of strength for each species.

2. The various names applied to one and the same species in different parts of the country lead to great confusion in classifying or applying results of tests.

3. Variations in strength are generally directly proportional to the density or weight of timber.

4. As a rule, a reduction of moisture is accompanied by an increase in strength; in other words, seasoned lumber is stronger than green lumber.

5. Structures should be, in general, designed for the strength of green or moderately-seasoned lumber of average quality and not for a high grade of well-seasoned material.

6. Age or use do not destroy the strength of timber, unless decay or season-checking takes place.

7. Timber, unlike materials of a more homogeneous nature, as iron and steel, has no well-defined limit of elasticity. As a rule, it can be strained very near to the breaking point without serious injury, which accounts for the continuous use of many timber structures with the material strained far beyond the usually accepted safe limits. On the other hand, sudden and frequently inexplicable failures of individual sticks at very low limits are liable to occur.

8. Knots, even when sound and tight, are one of the most objectionable features of timber, both for beams and struts. The full-size tests of every experimenter have demonstrated, not only that beams break at knots, but that invariably timber struts will fail at a knot or owing to the proximity of a knot, by reducing the effective area of the stick and causing curly and cross-grained fibres, thus exploding the old practical view that sound and tight knots are not detrimental to timber in compression.

9. Excepting in top logs of a tree or very small and young timber, the heart-wood is, as a rule, not as strong as the material farther away from the heart. This becomes more generally apparent, in practice, in large sticks with considerable heart-wood cut from old trees in which the heart has begun to decay or been wind-shaken. Beams cut from such material frequently season-check along middle of beam and fail by longitudinal shearing.

10. Top logs are not as strong as butt-logs, provided the latter have sound timber.

11. The results of compression tests are more uniform and vary less for one species of timber than any other kind of test; hence, if only one kind of test can be made, it would seem that a compressive test will furnish the most reliable comparative results.

12. Long timber columns generally fail by lateral deflection, or "buckling," when the length exceeds the least cross-sectional dimension of the stick by 20; in other words the column is longer than 20 diameters. In practice, the unit stress for all columns over 15 diameters should be reduced in accordance with the various rules and formulas established for long columns.

13. Uneven end-bearings and eccentric loading of columns produce more serious disturbances than usually assumed.

14. The tests of full-size long compound columns, composed of several sticks bolted and fastened together at intervals, show essentially the same ultimate unit resistance for the compound column as each component stick would have if considered as a column by itself.

15. More attention should be given in practice to the proper proportioning of bearing areas, in other words, the compressive bearing resistance of timber with and across grain, especially the latter, owing to the tendency of an excessive crushing stress across grain to indent the timber, thereby destroying the fibre and increasing the liability to speedy decay, especially when exposed to the weather and the continual working produced by moving loads.

The aim of your Committee has been to examine the conflicting test data at hand, attributing the proper degree of importance to the various results and recommendations, and then to establish a set of units that can be accepted as fair average values, as far as known to-day, for the ordinary quality of each species of timber and corresponding to the usual conditions and sizes of timbers encountered in practice. The difficulties of executing such a task successfully cannot be overrated, owing to the meagreness and frequently the indefiniteness of the available test data, and especially the great range of physical properties in different sticks of the same general species, not only due to the locality where it is grown, but also to the condition of the timber as regards the percentage of moisture, degree of seasoning, physical characteristics, grain, texture, proportion of hard and soft fibres, presence of knots, etc., all of which affect the question of strength.

Your Committee recommends, upon the basis of the test data at hand at the present time, the average units for the ultimate breaking stresses of the principal timbers used in bridge and trestle constructions shown in the accompanying table.

In addition to the units given in the table, attention should be called to the latest formulas for long timber columns, mentioned more particularly in the Appendix to this report, which formulas are based upon the results of the more recent full-size timber column tests and hence should be considered more valuable than the older formulas derived from a limited number of small-size tests. These new formulas are Professor Burr's, App. I.; Professor Ely's, App. J.; Professor Stanwood's, App. K.; and A. L. Johnson's, App. V.; while C. Shaler Smith's formulas will be better understood after examining the explanatory notes contained in App. L.

Attention should also be called to the necessity of examining the resistance of a beam to longitudinal shearing along the neutral axis, as beams under transverse loading frequently fail by longitudinal shearing in place of transverse rupture.

In addition to the ultimate breaking unit stress, the designer of a timber structure has to establish the safe allowable unit stress for the species of timber to be used. This will vary for each particular class of structures and individual conditions. The selection of the proper factor-of-safety is largely a question of personal judgment and experience, and offers the best opportunity for the display of analytical and practical ability on the part of the designer. It is difficult to give specific rules. The following are some of the controlling questions to be considered:

The class of structure, whether temporary or permanent, and the nature of the loading, whether dead or alive. If alive, then whether the application of the load is accompanied by severe dynamic shocks and pounding of the structure. Whether the assumed loading for calculations is the absolute maximum rarely to be applied in practice or a possibility that may frequently take place. Prolonged heavy steady loading and also alternate tensile and compressive stresses in the same piece will call for lower averages. Information as to whether the assumed breaking stresses are based on full-size or small-size tests, or only on interpolated values averaged from tests of similar species of timber, is valuable in order to attribute the proper degree of importance to recommended average values. The class of

timber to be used and its condition and quality. Finally, the particular kind of strain the stick is to be subjected to and its position in the structure with regard to its importance and the possible damage that might be caused by its failure.

In order to present something definite on this subject, your Committee presents the accompanying Table, showing the average safe allowable working unit stresses for the principal bridge and trestle timbers, prepared to meet the average conditions existing in railroad timber structures, the units being based upon the ultimate breaking unit stresses recommended by your Committee and the following factors-of-safety, viz:

Tension, with and across grain	Ten.
Compression, with grain	Five.
" across grain	Four.
Transverse rupture, extreme fibre stress	Six.
" " modulus of elasticity	Two.
Shearing, with and across grain	Four.

In conclusion, your Committee desires to emphasize the importance and great value to the railroad companies of the country of the experimental work on the strength of American timbers being conducted by the Forestry Division of the United States Department of Agriculture, and to suggest that the American Association of Railway Superintendents of Bridges and Buildings endorse this view by official action and lend its aid in every way possible to encourage the vigorous continuance of this series of Government tests, which bids fair to become the most reliable and useful work on the subject of strength of American timbers ever undertaken. With additional and reliable information on this subject, far-reaching economies in the designing of timber structures can be introduced, resulting not only in a great pecuniary saving to the railroad companies, but also offering a partial check to the enormous consumption of timber and the gradual diminution of our structural timber supply.

WALTER G. BERG, *Chairman,*
J. H. CUMMIN,
JOHN FOREMAN,
H. L. FRY,
Committee.

AVERAGE SAFE ALLOWABLE WORKING UNIT STRESSES IN POUNDS PER SQUARE INCH.[1]

KIND OF TIMBER.	TENSION.		COMPRESSION.			TRANSVERSE RUPTURE.		SHEARING.	
			With grain.						
	With grain.	Across grain.	End bearing.	Columns under 15 diameters.	Across grain.	Extreme fibre stress.	Modulus of elasticity.	With grain.	Across grain.
Factor-of-safety.	Ten.	Ten.	Five.	Five.	Four.	Six.	Two.	Four.	Four.
White Oak	1,000	200	1,400	900	500	1,000	550 000	200	1,000
White Pine	700	50	1,100	700	200	700	500,000	100	500
Southern, Long-Leaf or Georgia Yellow Pine	1,200	60	1,6 0	1,000	350	1,200	850,000	150	1,250
Douglas, Oregon and Washington Yellow Fir, Fir or Pine. Red Fir	1,200	—	1,600	1,200	300	1,100	700,000	150	—
	1,000	—	—	—	—	800	—	—	—
Northern or Short-Leaf Yellow Pine	900	50	1,200	800	2'0	1,000	600,000	100	1,000
Red Pine	900	50	1,200	800	200	800	600,000	—	—
Norway Pine	800	—	1,200	800	200	700	600,000	—	—
Canadian (Ottawa) White Pine	1,000	—	—	1,000	—	—	—	100	—
Canadian (Ontario) Red Pine	1,000	—	—	1,000	—	800	700,000	100	—
Spruce and Eastern Fir	800	50	1,200	800	200	700	600 000	100	750
Hemlock	600	—	—	800	150	600	4'0,000	100	600
Cypress	800	—	1,200	800	200	800	450,000	—	—
Cedar	800	—	1,200	800	200	800	350.000	—	400
Chestnut	900	—	—	1,000	250	800	500,000	150	400
California Red-wood	700	—	—	800	200	750	350.000	100	—
California Spruce	—	—	—	800	—	800	600,000	—	—

AVERAGE ULTIMATE BREAKING UNIT STRESSES IN POUNDS PER SQUARE INCH.[1]

KIND OF TIMBER.	TENSION.		COMPRESSION.			TRANSVERSE RUPTURE.		SHEARING.	
			With grain.						
	With grain.	Across grain.	End bearing.	Columns under 15 diameters.	Across grain.	Extreme fibre stress.	Modulus of elasticity.	With grain.	Across grain.
White Oak	10,000	2,000	7,000	4,500	2,000	6,000	1,100,0'0	800	4,000
White Pine	7,000	500	5,500	3,500	800	4 000	1,000,000	400	2,000
Southern, Long-Leaf or Georgia Yellow Pine	12,0 0	600	8,000	5,000	1,400	7,000	1,700.000	600	5,000
Douglas, Oregon and Washington Yellow Fir, Fir or Pine. Red Fir	12,000	—	8,000	6,'00	1,200	6,500	1,400,000	600	—
	10,000	—	—	—	—	5,000	—	—	—
Northern or Short-Leaf Yellow Pine	9,000	500	6,000	4,000	1,000	6,000	1,200,000	400	4,000
Red Pine	9,000	500	6,000	4,000	800	5,000	1,200,000	—	—
Norway Pine	8,000	—	6,000	4,000	800	4,000	1,200,000	—	—
Canadian (Ottawa) White Pine	10,000	—	—	5,000	—	—	—	350	—
Canadian (Ontario) Red Pine	10,000	—	—	5,0 0	—	5,000	1,400,000	400	—
Spruce and Eastern Fir	8,000	500	6,000	4,000	700	4,000	1,200,000	400	3,000
Hemlock	6,000	—	—	4,000	600	3,500	900,000	350	2,500
Cypress	6,000	—	6,000	4,000	700	5,000	900,000	—	—
Cedar	8,000	—	6,000	4,000	700	5,000	700,000	—	1,500
Chestnut	9,000	—	—	5,000	900	5,000	1,000,000	600	1,500
California Red-wood	7,000	—	—	4,000	800	4,500	740,000	400	—
California Spruce	—	—	—	4,000	—	5,000	1,200,000	—	—

[1] Recommended by the Committee on "Strength of Bridge and Trestle Timbers." American Association of Railway Superintendents, Bridges and Buildings.—Fifth Annual Convention, New Orleans, October, 1895.

SOCIETIES

NEW YORK CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT the Annual Meeting, on the 13th inst., of the New York Chapter of the American Institute of Architects, the following ticket for the ensuing calendar year was elected:

R. M. Upjohn, *President;* John M. Carrère and R. H. Robertson, *Vice-Presidents;* A. J. Bloor, *Secretary* and *Treasurer;* E. H. Kendall and R. H. Hunt, *Executive Committee;* A. Eichhorn, P. L. Le-Brun and S. E. Gage, *Committee on Library and Publications;* N. Le Brun, R. M. Upjohn, A. J. Bloor, E. H. Kendall and R. E. Gibson, *Committee on Examinations.* Mr. James B. Baker was elected a practising member.

Reports from the various Standing Committees were accepted and included the following items:

The report of the Executive Committee showed that a proposition for an *International* Institute of Engineers and Architects had been referred to the A. I. A.; the Chapter had acceded to affiliation with the Fine Arts Federation of New York, correspondence had been held with the Western New York Chapters A. I. A. in relation to getting a bill through the State Legislature for the licensing of architects, and the Secretary had corresponded with Mayor Strong in reference to the claims of architects who had competed for the proposed City-hall.

The Committee on Library and Publications reported that it continued to receive the current issues of some of the principal American, English, French and German architectural serials, among them the *British Architect* and the *London Building News*, *L'Architecture* and *La Construction Moderne*, and the *Zeitschrift des Oesterreichischen-und-Architeken-Vereines*, as well as those of the American Society of Civil Engineers.

The Secretary had presented for the Chapter library, T. M. Clark's well conceived and very useful volume, "*Architect, Owner and Builder before the Law*," long a desideratum in American practice, and he continued as from the first number of each to receive and have bound the current issues of the *American Architect and Building News*, *Architecture and Building* and the *Architectural Record*, with the intention, the Committee stated, of bequeathing them with other reading matter, to the Chapter.

The rebinding, among other volumes, of the entry-book for architectural assistants, draughtsmen and students in search of positions, recalls the fact that the entries in that book of twenty-five years' standing have reached 935,925.

The report of the Committee on Examinations alluded to a letter addressed some time ago by Mr. Stevenson Constable, Superintendent of Building Department, to a number of experts expressing, in substance, his desire for any information derived from such current experience in their practice as may furnish points and suggestions toward further amendments to the Building-law, which code has not yet been brought abreast of the essentials for complete safety demanded by the constant development and experiments incidental to the erection of high structures dependent on the system of steel caging or other metallic framework. In the previous instances, the report went on to say, of the revision of the city's building-laws, the Chapter's Examination Committee had been called to take part; and in view of this communication from the head of the Building

Department, the suggestion was offered that the Chapter might do well to make him a formal offer of assistance in the compilation of building regulations "up to date."

The following minute, prepared by a Special Committee, consisting of Mr. Howard Constable and the Secretary, was adopted:

"In the death of Mr. James Renwick, Practising Member of the New York Chapter A. I. A. and one of the founders and Charter Members of the Institute, the parent organization and the oldest of its now numerous component parts, the Chapters have alike lost one of the best known and most respected of their colleagues, the profession one of its most successful practitioners, and the community an architect who, in 'the day of small things' for art in this country and in the midst of the then crude conditions influencing the public mind, made the most (as is shown in the biographical sketch of his professional life appended to the published *Proceedings* of the Institute's Twenty-first Annual Convention) of the meagre appreciation and niggardly opportunities offered to the professors of the various Fine Arts, and produced results not inferior, and sometimes superior, to much current work, having the advantage of environments, appliances and rewards greatly more conducive to artistic development. In his private relations, Mr. Renwick enjoyed widespread and well-deserved popularity, and New York loses one of its foremost citizens in his demise."

Much satisfaction exists, among the members of the Chapter, in view of their convenient and cheerful new quarters up town in the recently erected office-building, 156 Fifth Avenue, northwest corner of 20th Street.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

THE MERCANTILE CLUB-HOUSE, PHILADELPHIA, PA. MESSRS. BAKER & DALLETT, ARCHITECTS, PHILADELPHIA, PA.

[Gelatine Print issued with the International and Imperial Editions only.]

COMPETITIVE DESIGN FOR THE MINNESOTA STATE-HOUSE, ST. PAUL, MINN. MESSRS. WENDELL & HUMPHREYS, ARCHITECTS, DENVER, COLO.

THIS design deserves the careful consideration of our readers from the fact that to its authors was awarded in the first competition, by the expert advisers, Messrs. Wheelwright and Cobb, the first place amongst the five designs commended. Moreover the design here shown and submitted in the second competition was ranked by the expert adviser, Mr. Wheelwright, amongst the five designs which he considered deserving of the five prizes. Yet, acting within the limits of their discretion, the Capitol Commissioners thought it wise to displace this design in favor of one that was not recommended by Mr. Wheelwright.

For their efforts and expenditure of time and money the authors have, then, to console themselves with having achieved a distinct professional success, a rather meagre consolation in view of the fact that they had once seemingly won the position of architect to the executed work and the second time had won a money-prize which would in a degree have offset the cost of their work. If the authors' allegations are to be accepted, they seem to have been in the second instance the innocent victims of a curious case of mistaken identity, based not on a similarity of names, but on the less substantial similarity of initials. Admitting that the Commissioners had testimony which justified suspicion — testimony, however, which the authors declare that, given time, they can overthrow — it seems to us that, all things considered, they might have contented themselves — if their decision was based on the alleged suspicion — with assigning the work to Mr. Gilbert and yet making the distribution of the minor prizes in accordance with the expert's award. It seems to be peculiarly a case where something in the nature of a "consolation prize" is called for.

PLANS OF THE SAME.

TENEMENT-HOUSE, BAKER ST., PHILADELPHIA, PA. MESSRS. WILSON BROS. & CO., ENGINEERS AND ARCHITECTS, PHILADELPHIA, PA.

THIS building was erected for the "Beneficent Building Association," of Philadelphia, whose object it is to buy up and remove the miserable hovels in which many of the poorer class are lodged in this as in other large cities, and replace them with buildings which shall afford decent accommodation at an equally low rent. To accomplish this object, it is necessary that the rooms be as small as possible consistently with sanitary requirements, so as to bring the rent within the reach of this class of tenants; and to make the building as simple and inexpensive as possible with due regard to their comfort and safety. The central portion of the building, including stairs and water-closets, is strictly fireproof — the stairs being of iron, the floors of concrete and all the walls and partitions of brick, making what is known as the 'tower fire-escape," in accordance with the requirements of the Philadelphia Building-Laws in this particular, and insuring greater cleanliness in this part of the building which is used in common by all the tenants. The other parts of the building are of ordinary construction, with wooden floors and partitions. Bath-rooms and bins for the storage of coal are provided in the basement.

ALTERATIONS TO HOUSE OF J. D. SAFFORD, ESQ., SPRINGFIELD, MASS. MR. E. J. PARLETT, ARCHITECT, SPRINGFIELD, MASS.

[Additional Illustrations in the International Edition.]

ALL SAINTS' EPISCOPAL CHURCH, LOMBARD AND ASHMONT STS., ASHMONT, BOSTON, MASS. MESSRS. CRAM, WENTWORTH & GOODHUE, ARCHITECTS, BOSTON, MASS.

[Gelatine Print.]

ALTHOUGH this building was dedicated and occupied in December, 1893, it was not consecrated until last Sunday. It is built of seam-faced granite and has been paid for by private subscription among the parishioners, the largest subscription being the gift of Col. Oliver W. Peabody, who only recently paid off the remaining debt and made all the sittings free. The tower was erected by Mr. and Mrs. Peabody in memory of Everett Peabody, killed at the battle of Pittsburgh Landing, April 6, 1862, and of William Bourne Oliver Peabody, who died March 3, 1894.

SYNAGOGUE OF THE NORTH CHICAGO HEBREW CONGREGATION, LA SALLE AND GOETHE STS., CHICAGO, ILL. MR. S. S. BEMAN, ARCHITECT, CHICAGO, ILL.

[Gelatine Print.]

GRAY'S INN CHAPEL, FROM THE CHANCEL, LONDON, ENG. RESTORED BY MR. C. H. SHOPPEE, ARCHITECT.

DETAIL OF NO. 69 ALDERSGATE ST., LONDON, ENG. MESSRS. ROMAINE, WALKER & TANNER, ARCHITECTS.

EXHIBITIONS

ATLANTA, GA. — *Cotton States and International Exposition:* September 18 to December 31.

BOSTON, MASS. — *Loan Exhibition; Gobelin Tapestries; Japanese Paintings; Line Engravings, Mezzotints and Etchings by Rembrandt:* at the Museum of Fine Arts.

Triennial Exhibition of the Massachusetts Charitable Mechanic Association, including Art Exhibition and Special Poster Show: October 2 to November 30.

Paintings from the Paris Salons of 1895: at the Jordan Art Gallery, 450 Washington St., opened October 14.

Egyptian and Venetian Sketches, by Hamilton Emmons: at J. Eastman Chase's Gallery, 346 Boylston St., November 19 to December 3.

Vinton's Portrait of Archbishop Williams: at Williams and Everett's Gallery, 190 Boylston St.

BRIDGEPORT, CONN. — *Exhibition of Artistic Posters:* at the Public Library, November 9 to 30.

CHICAGO, ILL. — *Eighth Annual Exhibition of Oil-paintings and Sculpture:* at the Art Institute, October 22 to December 8.

Paintings by Glasgow and Danish Artists: November 19 to December 22.

NEW YORK, N. Y. — *Twenty-ninth Semi-annual Exhibition, including Loan Exhibition of Early American Paintings, Old English Paintings, and the Cullum Collection of Classic Sculptures:* at the Metropolitan Museum of Art.

Loan Exhibition of Portraits: at the National Academy of Design, October 30 to December 4.

Flowers in Water-color, by Paul de Longpré, also, Butterflies of all Nations: at the American Art Galleries, Madison Square South, opens November 28.

PHILADELPHIA, PA. — *Autumn Exhibition of the Philadelphia Art Club:* opened November 18.

Works by Swedish Artists: at the Pennsylvania Academy of Fine Arts, until December 5.

PITTSBURGH, PA. — *Loan Collection of Paintings:* at the Carnegie Library, during November.

NOTES AND CLIPPINGS

A PRIZE FOR AN ESSAY ON HEATERS. — The German Hygienic Association offers a prize of 1,200 American dollars for an original essay on electric heaters. It must be written in German, and sent in before July 1, 1896, to Prof. Konrad Hartmann, 18 Fasannstrasse, Charlottenburg. The essay will remain the property of the author, but he must publish it within six months. — *London Globe.*

IVORY MARKETS. — Antwerp is the principal market in the world for ivory. In 1884, 582,177 pounds were imported. Prior to 1890 ivory markets were held annually at Antwerp; since that date, however, they are held every month. Merchants come from Germany, France and England. Of the three principal markets for ivory, Antwerp in 1894 took 410,000 pounds; London, 153,220 pounds; and Liverpool, 131,174 pounds. — *Boston Herald.*

S. J. PARKHILL & CO., Printers, Boston, U. S. A.

TENEMENT-HOUSE.

607 BAKER ST.

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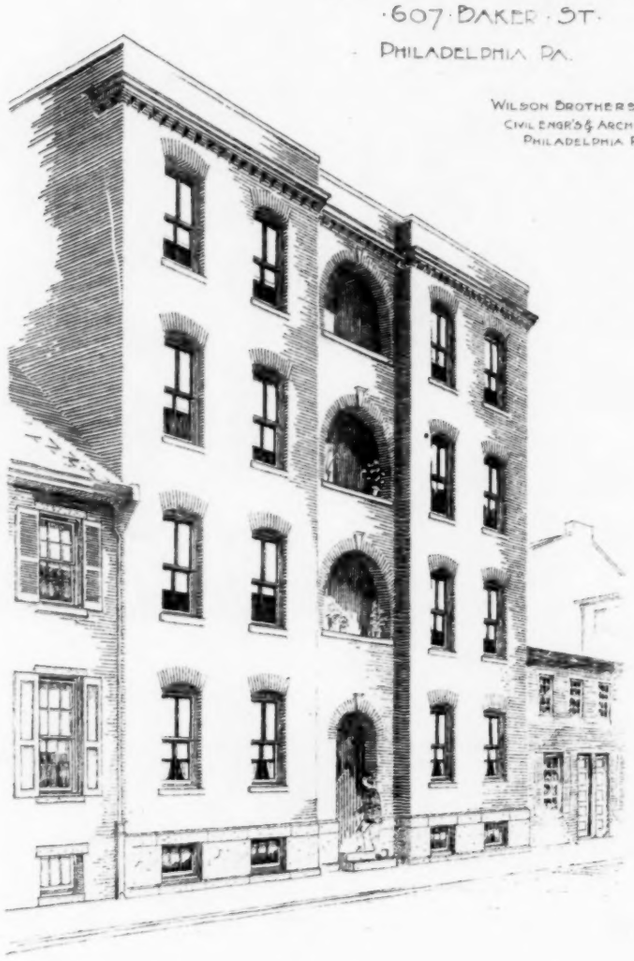

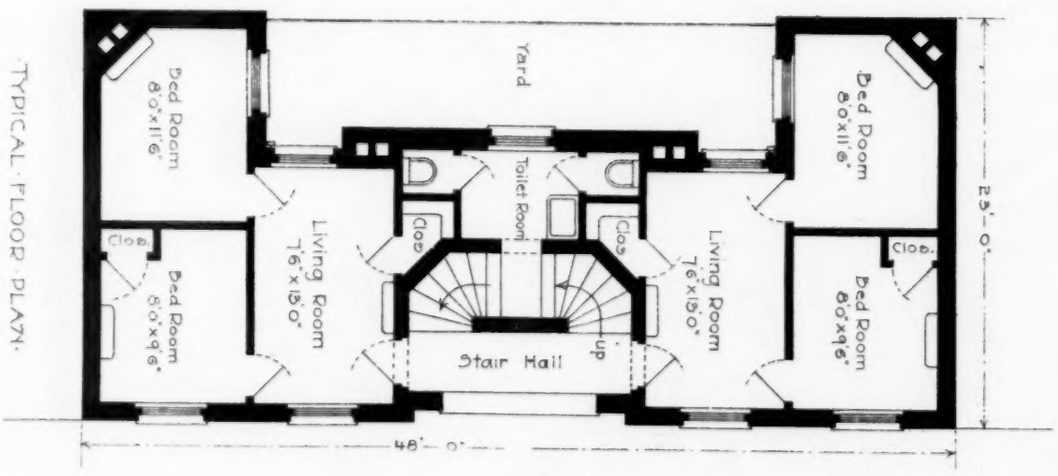

TYPICAL FLOOR PLAN.

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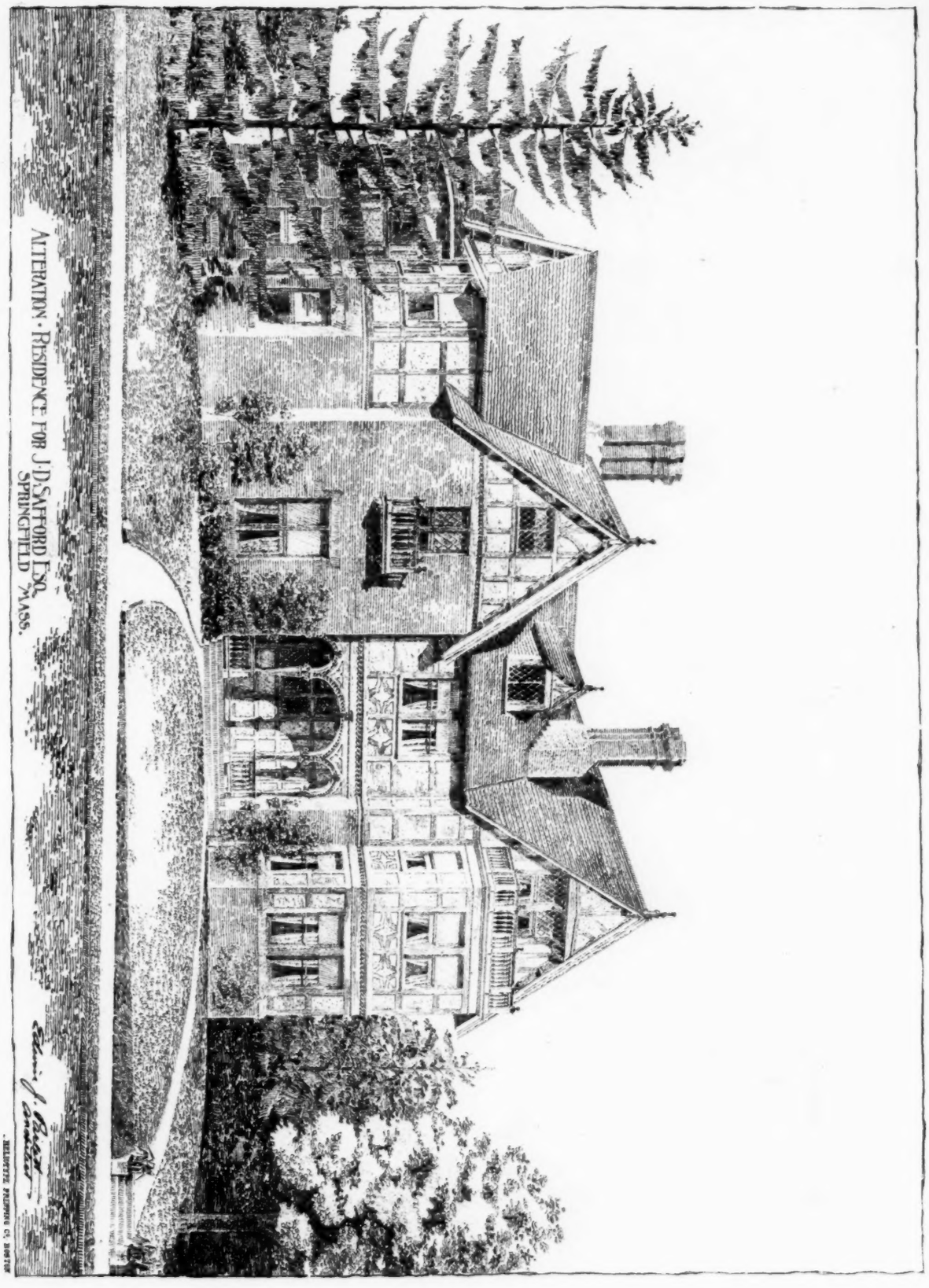

ALTERATION · RESIDENCE FOR J. D. SAFFORD ESQ. SPRINGFIELD MASS.

Edwin J. Baker Architect

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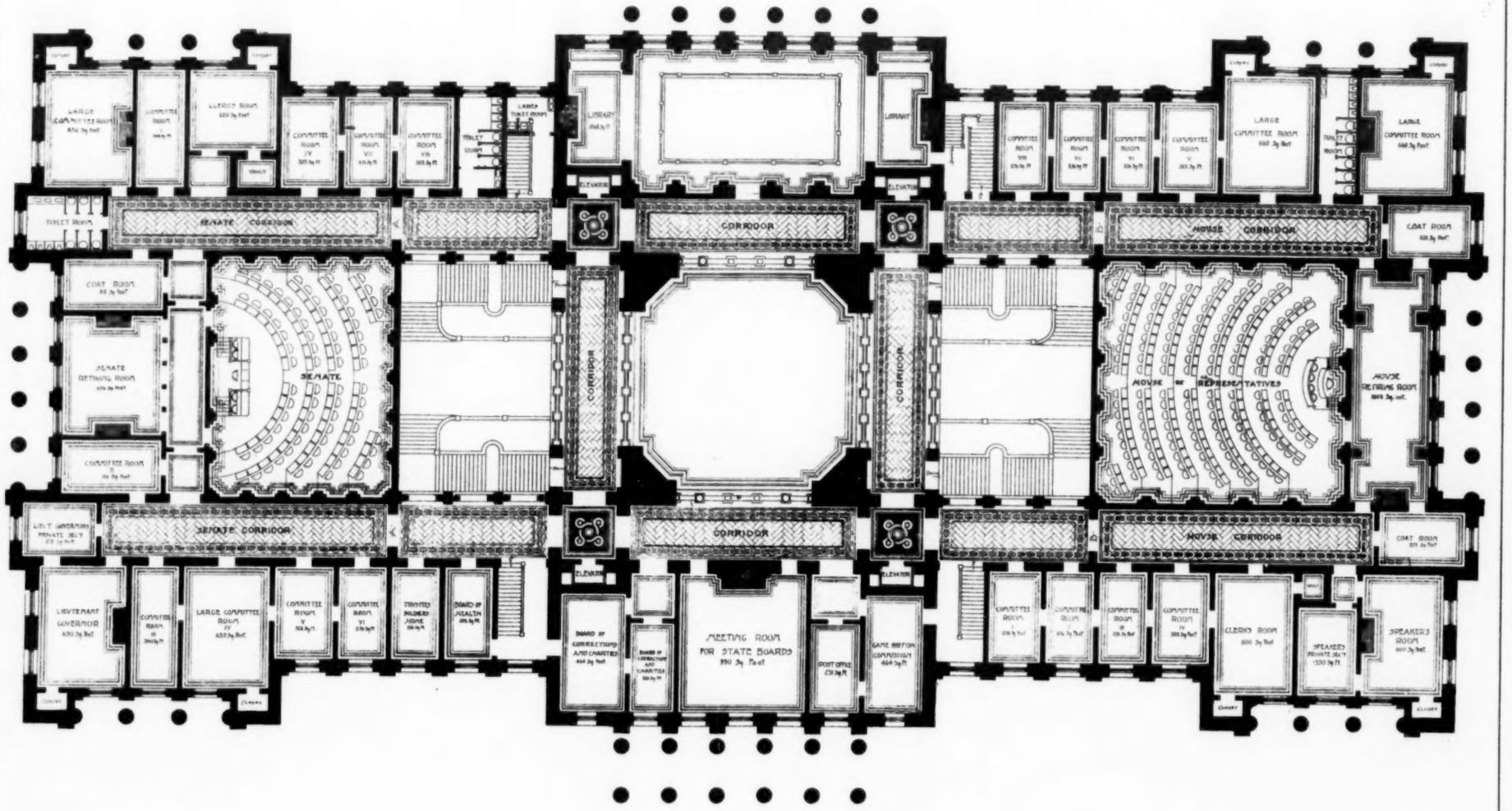
DESIGN FOR MINNESOTA STATE-HOUSE, SUBMIT

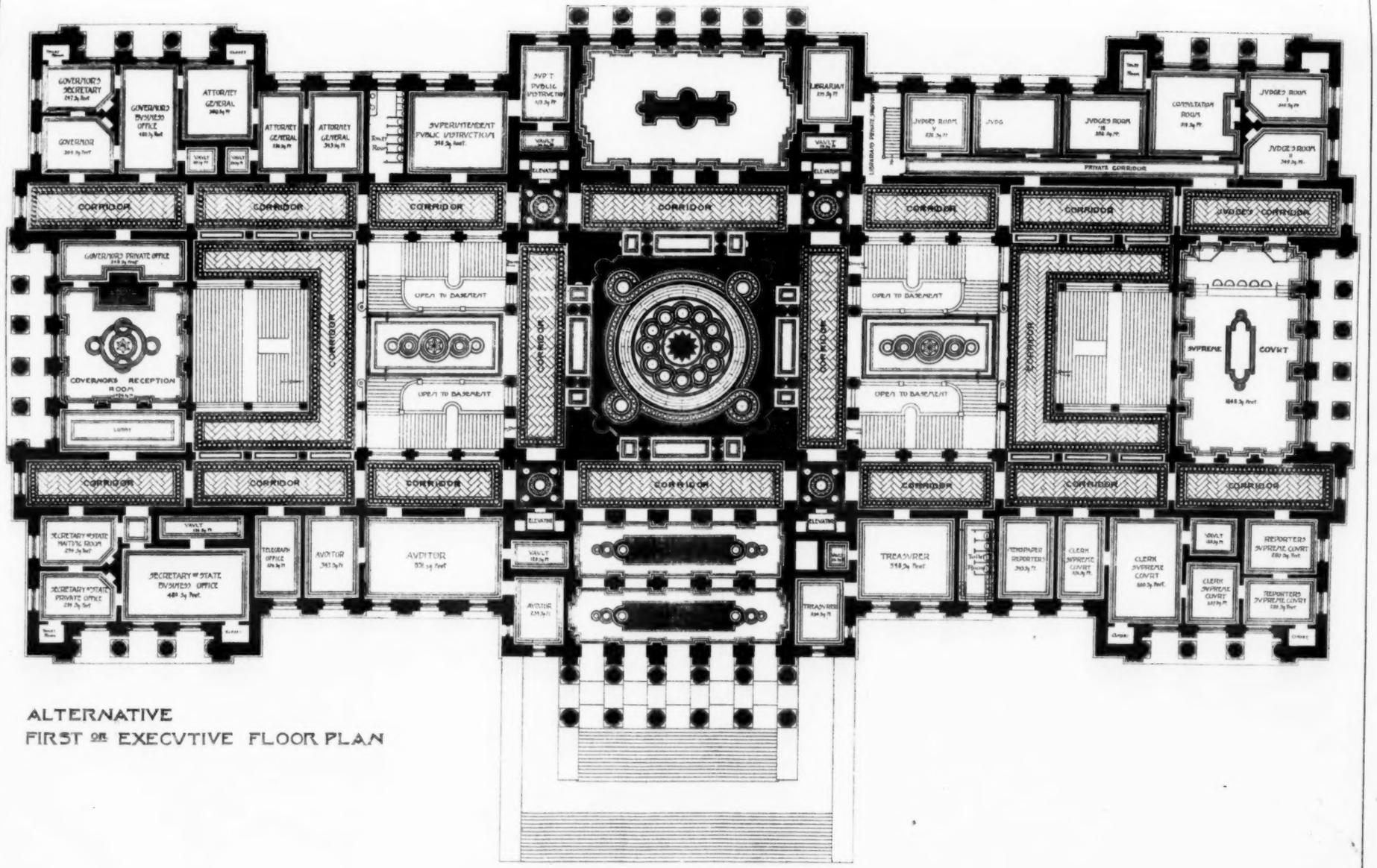
H. T. E. WENDELL AND JOHN J. HU

E, SUBMITTED IN THE SECOND COMPETITION.

JOHN J. HUMPHREYS, ARCHITECTS.



SECOND OR LEGISLATIVE FLOOR PLAN.



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DESIGN FOR MINNESOTA STATE-HOUSE, SUBMITTED IN THE SECOND COMPETITION.

H. T. E. WENDELL AND JOHN J. HUMPHREYS, ARCHITECTS.