

BALTIMORE CLUB—HOUSE, BALTIMORE, MD.



PRICE 15 CENTS.

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. L.

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No. 1034.

Entered at the Post-Office at Boston as second-class matter.

OCTOBER 19, 1895.



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WILLIAM WETMORE STORY, who died in Italy the other day, at the age of seventy-six, had for many years been a conspicuous figure in American art. His countrymen, it is true, came to look upon him, on account of his long residence abroad, as something of a foreigner; but in Rome and Florence, and even in Paris and London, he was always regarded as the very type of an American artist, and America could hardly have had a more creditable representative. Not only as a sculptor, but as a painter and a poet, he was distinguished throughout Europe, and his prose writings, practical, romantic and philosophical, are well known to general readers. It may surprise people who have been accustomed to think of him as the chosen friend and companion of the Muses, to hear that his earliest, and perhaps most successful books, were law treatises; but every lawyer knows his three volumes of "*Reports of the Decisions of the Circuit Courts of the United States*"; and his work on "*Contracts not under Seal*" is already in its tenth edition, while six editions have been published of his "*Treatise on Sales of Personal Property*." That the study of these highly practical subjects, to which he devoted himself for sixteen years, during his courses at Harvard University, and in his subsequent law-practice at Salem, was quite as good a preparation for the best artistic work as the diet of moonbeams and caterwauling which is supposed by so many feeble-minded youths in this country to be the proper nurture for painters and poets, is sufficiently shown by the extraordinary distinctions which he received, as an artist, from foreign governments. Although his Massachusetts Alma Mater never gave him any degree beyond the LL. B. of his graduating diploma, Oxford gave him its D. C. L. degree, which is the highest honor that England has to bestow upon intellectual excellence; France made him first Chevalier, and then Officer of the Legion of Honor, and Italy made him Commander of the Order of the Crown. His best-known artistic work in this country is perhaps the Everett Statue, on the Public Garden, in Boston, but there are many other statues and portraits by him, not only in Boston, but in other American cities.

SEVERAL Detroit architects have drawn our attention to the way in which the designs for the new jail to be constructed in that city is to be selected. It is hardly necessary to say that the firms which seek contracts for jail-building

have been active in assuring the city authorities that "architects do not know anything about jails"; that "jail-building is a profession by itself," and so on; and the authorities seem inclined to listen to them. Whether the tax-payers will be so easily convinced remains to be seen. So far as the planning of jails is concerned, it is obvious that an architect, who has been trained in the general principles of planning and sanitation, and who has access to the plans of all the best structures of the kind all over the world, is more likely to produce a design in which the circumstances are utilized to the best advantage than a man whose experience is confined to the execution of one or two buildings of the kind under superior direction; while the advantage or, rather, the necessity, of placing under professional control the carrying-out of such complicated building contracts is too evident to require comment.

TROUBLES seem to multiply around the high office-buildings in New York. A few days ago, a fire occurred in the basement of the Pulitzer Building. There was not much to burn, and the fire was soon put out; but, in the meantime, the upper stories were filled with smoke, which might have been dangerous, and was at least very annoying to the inmates of the building. About the same time, a deputation, moved thereto, probably, by the complaints of the fire-engineers, that the upper portion of the lofty office-building could not be reached with water from the fire-apparatus, waited upon the Mayor, with the request that a new high-service system should be constructed, adapted for throwing water into the upper part of buildings fifteen or twenty stories in height; but was repulsed by his Honor, with the observation that the people who built such structures knew at the time the risk that they were incurring, and that the tax-payers were under no obligations to come to their rescue now. As a third instance, suit has been begun, as is reported, to compel the removal of certain cornices of the American Surety Building, which, at the height of two hundred feet from the ground, project over the adjoining property. This last matter, which may, in the end, involve the consideration of the right of the owner of a lofty building to take light and air from over his neighbors' land, has in it possibilities of a considerable change in the laws relating to real property, and it is likely that the "sky-scrapers" have plenty of tribulation before them.

THE Philadelphia authorities, or rather the Building Commission of the new Philadelphia City-hall, acting in connection with a committee appointed by the various artistic institutions of the city, have ordered a competition for designs for the decoration of the Council Chamber in the new building. All American artists, women as well as men, may compete. The sketches to be submitted must include a complete plan of decoration for the room, with a clear indication of the color scheme, and drawings showing all the important details, and at least two mural paintings must form portions of the design. For the best set of sketches a prize of three thousand dollars is offered. The author of the second best design will receive one thousand dollars; and seven hundred and fifty dollars will be awarded for the third best set. The Commissioners, who probably know something of the eccentricities of artists, do not bind themselves to confide the execution of the work to the author of the best design; but it is their desire to do so; and in that case, the compensation paid for the execution of the work will be in addition to the three-thousand-dollar prize. This stipulation is rather unusually liberal, and indicates a favorable disposition toward artists on the part of the Commission. The designs are to be judged by a jury of seven members, four of whom are to be artists of recognized standing; and these are to be selected in such a way as to avoid all suspicion of local partiality. That the controlling voice in the jury should be given to professional artists is another indication of the honorable intentions of the Commission, which will do much to encourage competitors. The competing sketches must be in the hands of the architect, Mr. W. Bleddyn Powell, at the City Hall, Philadelphia, on or before April 15, 1896. The right is reserved to exhibit publicly all the sketches submitted in competition; and no competitor will be permitted to withdraw his design until after the exhibition.

ONE hundred and eleven sets of designs for the new Art Building of Fairmount Park, Philadelphia, have been received by the Commissioners of Fairmount Park. The plan proposed by the Memorial Hall Committee for judging the designs, which will probably be adopted by the Commission, is to refer them to a jury, consisting of the Provost of the University of Pennsylvania, one person to be selected by the Directors of the Philadelphia Academy of Fine Arts, and three disinterested architects, with two experts who are not architects, to be chosen by the Memorial Hall Committee. The jury is, according to the proposed scheme, to consider all the competing designs, and, on or before November 30th next, to report to the Commission, presenting eight of the designs, which they consider most worthy of the prizes offered.

ACCORDING to the Philadelphia newspapers, the prospect of having an adequate building for a fine-art museum excites great interest in the city; and with a public spirit quite characteristic of Philadelphia, several owners of valuable collections of works of art have already signified their intention of presenting them to the city outright, or, at least, of placing them on permanent exhibition in the Museum, as soon as the building is ready to receive them. In a quiet way, a great many valuable pictures have been of late years brought together in Philadelphia, and the public appreciation of such things, which has been developed, undoubtedly, in an important degree, by the fine works in the Drexel Institute galleries, is very wide-spread. The collections already promised to the new museum are said to represent an investment, on the part of their owners, of nearly three million dollars, and, in addition to this, a bequest of a million is said to have been made to the city for the purposes of the museum.

AN immense fly-wheel, weighing twenty-five tons, burst the other day in the power-house of the Hudson County Electric Light Company, in Hoboken, New Jersey, killing the engineer, and injuring several other persons. The cause of the accident, it is hardly necessary to say, was the excess of the tension caused by the centrifugal force in the wheel over the resistance of the iron designed to resist that force. Whether the sections of the iron were badly calculated, or its resistance was diminished by concealed flaws, is a matter which can easily be determined, and it ought to be determined without the delay, and expense, and uncertainty, of such proceedings as those in connection with the Ireland disaster. The civil engineers have long advocated the appointment of professional men of reputation, who should be sent, as experts, on behalf of the courts, to examine and report on just such cases, instead of compelling juries to listen to the bewildering testimony of expert witnesses, employed by two opposing parties, and influenced, not to say misled, in every possible way by the respective counsel, before they take the witness-stand as well as afterwards.

JUDGING from the insurance reports, the character of building in this country is slowly changing, fireproof, or, at least, fire-resisting, structures having begun to replace, to an extent which materially affects the total of losses by fire, the combustible buildings of the past generation. From 1893 to 1894, there was a diminution in the aggregate fire-loss, for the first nine months in the year, of nearly ten million dollars, or about ten per cent. From 1894 to 1895, there has been a further diminution, making a large additional saving to our people, who seem likely to finish the year with nearly twenty million dollars in their pockets, rescued in twelve months from the national ash-heap. Of course, a part, possibly the whole, of this saving may be accidental, but against this we must set the fact that a great increase has been made in the number of buildings, and the value of goods stored in them, within the past two years; so that an actual saving, in dollars, from year to year, shows a much larger proportional improvement in the conditions on which fire-losses depend. Even as they are, however, a great deal can still be saved out of the hundred and twenty-odd millions which we pay every year, partly directly, and partly through the insurance companies, in feeding conflagrations. It is hard to realize that this sum would keep all the people in the United States supplied with boots

and shoes; or, if we preferred to expend it in another way, would pay the whole cost of maintaining all the public schools in the United States; or would pay the expenses of maintenance of the military and naval establishments of the United States, with the interest on the public debt in addition; or would pay the salaries of all the ministers in the United States at least five times over; or would provide every eighteen months a navy superior in force to that of Great Britain; or, applied to interest and sinking-fund, would provide every family in the United States with a twenty-acre farm, which, at the end of ten years, would be clear of debt. Any one of these things is within our reach at once, or all of them successively in due course, if we can only give up feeding our national ash-heap, and build in such a way that our buildings, and what we put into them, will not burn up. The rules of this sort of construction are well known, but, in order to carry them out effectively, they must be generally applied; for no care can protect a building entirely against combustible neighbors. Every good building, however, is a guardian and defence to those around it; and the people who are public-spirited enough to erect such buildings may find some satisfaction in the thought that every dollar of insurance premiums that they, or their tenants, or their neighbors save thereby goes directly into the pockets of the poorer people, who, in the end, have to pay all the expenses incident to the production, storage and sale of the goods that they buy, insurance premiums included.

THE arrogant and absurd assumption that Americans, under a free Government, do not build as strongly and well as the police-ridden Germans has received two valuable commentaries within a very short time. Three weeks ago, a building in process of construction in the Klosterstrasse, in Guben, a city of Brandenburg, collapsed, burying sixteen workmen in the ruins. Nine of the men were instantly killed, and the others severely injured. Last week, again, a spinning-factory, at Bocholt, in Westphalia, fell down, burying forty men, ten of whom were killed outright, while nine more were seriously injured.

THOSE architects who may be commissioned to design bird-houses should take to heart the following suggestions from the *Bautechnische Zeitschrift*. It is very common for people who set up houses or boxes for sparrows, martins, swallows, blue-birds, doves or other birds, to add to the little mansions a perch, or horizontal stick, or even a small piazza projecting from the region of the front door, with the idea that the inmates of the house may like to sit there in the sun on fine days, or that it may be convenient for them to have a place to alight for a moment before they creep into their nest. This practice, we are informed, is an objectionable one. It is true that the birds who are lawfully entitled thereto do frequently sit for a moment on the perch before they enter the door, but it is sad to relate that evil-disposed birds, such as hawks and crows, who have no rights in the premises, do the same; and, worse than this, when the young birds inside, supposing the visitor on the perch to be their mamma, with provisions, put their heads out of the nest, and open their bills, the visitor takes advantage of the opportunity to seize them, by putting his beak through the door, and carries them away for the refreshment of his own family. Crows, according to our authority, soon learn the convenience of this arrangement, and are very fond of establishing themselves on these little perches, and extracting the children of the lawful proprietors through the adjacent door. Bearing in mind the propriety of dispensing, for this reason, with exterior perches or promenades of all kinds, as appendages to bird-houses, another precaution should be taken to keep their inmates out of the reach of cats. Cats are quite as fond as crows of young birds, and, where a bird-house is accessible, find much entertainment, as well as nourishment, in sitting down before it, and clawing out the inhabitants, one by one, through the door. In the absence of means for elevating the ethics of cats, a good deal can be done to interpose physical obstacles to this sort of amusement, by setting up a square of board behind the entrance of the bird-house, a little larger than the entrance, and two or three inches away from it. The rightful proprietors of the establishment find no difficulty in turning around this defence, to reach their nests, while pussy finds it impossible to bend her paws around it, so as to reach the young birds behind.

ART IN THE MODERN CHURCH.¹—III.

ON UN-CHRISTIAN CHURCHES.



Fig. 1.

HAVING pointed out the element that must underly the production of all true church architecture, or of Christian architecture, as it may properly and more conveniently be called, we are now prepared to study some illustrative examples of churches that do not illustrate these fundamentals. We will thus gain a clearer conception of the many ways in which the Christian idea is avoided in current architectural design. And it is well to note, in selecting some few instances for review, that we are looking at them solely from this standpoint. Our present purpose is not to inquire, Are they architectural? Are they picturesque? Do they fulfil reasonable requirements of good taste? Or, do they answer their purposes sufficiently well? But, do they illustrate, in any way, Christian sensibility and feeling? Are they buildings we would instinctively recognize as Christian structures, consecrated to Christian and holy purposes? Are they characterized by a proper and true Christian spirit?

In looking at them from this standpoint, we must remember, further, that the inclusion of some well-known and readily recognizable feature in their design—some feature we instinctively recognize as churchly or which long familiar usage has accustomed us to regard in that light—does not redeem a structure without other Christian elements from an irreligious aspect. A tower, as we have seen, does not make a church, nor does a stained-glass window. Yet we have been accustomed so long to see these things in church design, that any structure which includes the one, or any wall which contains the other, oftentimes seems, at first glance, to be a holy edifice, whether it may prove so or not when judged by Christian standards. A very tolerable illustration of this is furnished by the subjoined Figure 1. Truly, it is not a good design for a church; there can scarce be disagreement on that point. But if not a church, what manner of building is it?

Those familiar with the town of Fairhaven, in Massachusetts, will at once recognize its Town-hall. But might it not as well pass for a church, as the average church is now designed? There are the towers, two of them, and a third little one perched on the apex of the high pitched roof, which might as well cover the audience-chamber of a church as the meeting-room of a town-hall. There are large traceried windows, of good size and convenient shape, apparently destined for stained-glass. There is a triple-arched entrance that seemingly leads to the vestibule of the church, while the dormers and gables suggest similar ends. In fact, it would be easy for this to pass as a church with a Sunday-school in the lower story.

There is nothing consecrated in this design; there is no hint of fervent faith on the part of the designer, nor of any lofty purpose which would distinguish this structure from any other. Yet we are



Fig. 2.

accustomed to see just such combinations in our average church design, and so we may unthinkingly say that, "This building looks more like a church than a town-hall," or, "The architect has fol-

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. 1033, page 16.

lowed the model of a church too closely in his design to make a successful lay-building." Yet this resemblance is not the fault of the author, but our own. We have so long looked upon such a combination of certain parts as churchly that we arbitrarily give a sacred significance to forms in themselves un-Christian, or attach a holy

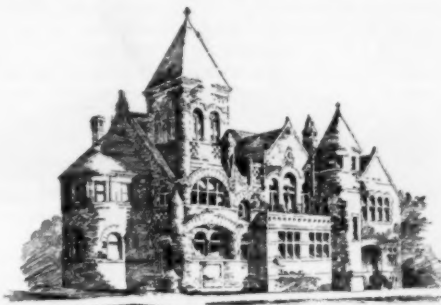


Fig. 3.

association to them though they be devoid of any odor of sanctity. How baseless and foolish such an association is, this design shows in a manner almost admirable in its directness. Its author himself tells us it is not a church; and then we blame him for giving what we consider an ecclesiastical air to his structure! Quite failing ourselves to understand the really great lesson it teaches, that neither in certain architectural forms nor in their combination does religious architecture consist.

A more famous design than that of the town-hall of Fairhaven, a design, indeed, on which it is in a measure based, is the City-hall of Albany, in New York. This structure departs so completely from the traditionary form of the town-hall, as it has been developed in



Fig. 4.

the past three hundred years, and borders so near that of the church, as to be neither the one nor the other, and certainly recalls the church as easily as it suggests the civic edifice. The entrance porch, the tower, the large windows, the gables, the dormers, all have a more or less ecclesiastical suggestiveness that is entirely out of place in a civic building. Yet none of these forms are religious or Christian in themselves, and the only error in their use is the manner in which they approximate a false standard of church building we have created for ourselves in our own time.

The next figure, Figure 2, is a picturesque little design that might as well be a church as a "Mountain Inn," as its designers



Fig. 5.

labelled it. Here we have a greater tower and a lesser; a high-pitched roof, and dormers lighting what is, apparently, the hall within. Where guests may be stowed in this hostelry is not visible from our present point-of-view; but, so far as our position goes, a simple change in the legend is all that would be needed to convert

this building from a hotel to a church. Yet how debased the art that by a mere change of name, will transform a lodging and eating house into a church of the Most High! How abominable the critic who would venture upon so impious a suggestion! Obviously, our methods of church designing must be wrong, our conception of



Fig. 6.

God's house erroneous, if we can so glibly transform a worldly structure into a sacred one! Yet, if our church architecture, as a whole, was characterized by that loftiness of feeling and holiness of purpose that rightly belongs to it, we should never, for a moment, make such comparisons. We should look, then, in our churches for other things than towers and high roofs, or dormers and traceried windows. It should be the sacred quality of the building we would seek out, the subtle thought that should redeem it from the mass of the world's worldly buildings, and set it apart as God's own.

And how shall we describe the structure shown in Figure 3? What manner of building is this, and for what purpose was it made? Intended as a church by its designer, it surely might as well pass as a dwelling-house of pretentious design, or a public hall. It can hurt



Fig. 7.

no one's feelings to say there is no element of Christianity here, no suggestion of holy usage, no hint of sacred association, no idea of godliness; for apparently its author never, for a single moment, considered any of these as essential to his work. It would be interesting to see a plan of this building, in default of the structure itself, for the idea of a single large room set apart for the solemn services of religion is so cleverly hid, that it is hard to tell what possible use the structure may be put to. That it is a church its author tells us, but that it does not look like a church, that it is devoid of every suggestion of Christian thought, purpose, use, must be evident to all.

Much less pretentious is Figure 4, though it errs in the same



Fig. 8.

direction. Why should this building be a church rather than a school-house or the town-hall of some small and retiring village? There is a tower—though it is scarce higher than the roofs—and there are the roofs, and on these two unecclesiastical elements its authors have depended upon giving a sacred air to their design. It does not matter that this is an inexpensive design, probably for a

small and struggling community; that may well excuse its simplicity, but it does not affect the fact that as a piece of design there is nothing sacred in it. Knock off the cross from the apex of the roof, and there is nothing in the architecture to suggest that it is a church. It does not stand apart from other buildings by reason of its spirit or the quality of its art. A visitor to the town for which it was designed could well be excused for asking the townsfolk what it was for.

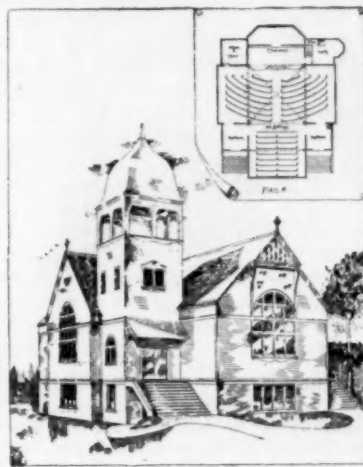


Fig. 9.

Nor is there anything in Figure 5 that suggests a church. Only by the process of exclusion, and a careful elimination of every other sort of structure would one finally be brought to admit that it was a church. It has not even a tower to add to the ecclesiastical aspect. It is a fair type of the country church, inexpensive, small and unpretentious, that answers to a well-defined and popular need in America. Yet in endeavoring to meet this want it did not occur to its author that a church

was a different sort of building than a commercial building; it did not occur to him that he was erecting a structure dedicated to God, intended for pious purposes, which should tell all beholders of these purposes and their value to mankind. He brought together a few simple elements in an elementary way, and labelled them a church. It satisfied those who sought it of him, and what more could be asked? Yet, so far as may be judged from the drawing, not one of the parties to this transaction had a proper comprehension of the subject in hand. The element of Christianity is as wholly wanting in this design as though there was no such thing.

In Figure 6 is seen a more ambitious effort to produce a typical church easily distinguished as such. And yet what more does it show than a more orderly use of certain elements of architecture? The broad pointed roof, lighted by mimic dormers, naturally suggests the large room within, which the windows on the sides tell us must be amply lighted. To what uses the other parts may be put it would be difficult to tell without a plan; but here again, as in Figure 3, it is the cross upon the building that definitely determines its nature, not its structural parts. Yet architecture is a speaking art, an expressive one, and it should no more be required to place a cross on a church to point it out than that a large label, "This is a Church," be stretched across its wall. A cross upon a church is



Fig. 10.



Fig. 11.

a pious and proper symbol, but it should not be needed to explain the architecture nor to give it meaning.

Yet truly, were it not for the crosses upon the design for the church shown in Figure 7, why should we think it a church? Barring these, there are but three things in the design which would even so much as hint a church; the pointed roof, the pointed window

and the two small buttresses on the face of the main part. The tower, and the piece behind it, might as well be part of a dwelling as the vestibule of a church and its Sunday-school. That this is obviously an inexpensive design does not affect the question of its generally irreligious nature. Christian expression in architecture is not

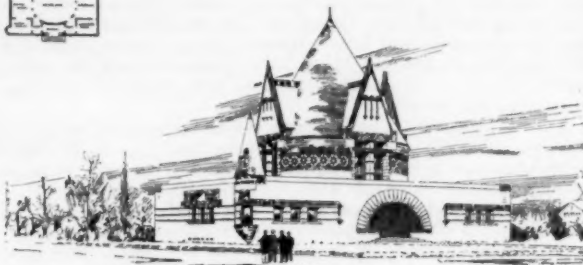


Fig. 12.

wholly dependent on the cost at so much per cubic foot, nor is it something the architect is called upon to measure out in accordance with the amount paid in to him for his work. The Christian architect—I use the word in the general sense it is employed throughout these papers—is a Christian architect all the time. A costly building may give him more ample opportunities for the display of his Christian talent than a relatively cheap one; but he does not reserve it for such expensive work, but freely gives it in all his religious undertakings. The church of to-day does not always display that lowliness of spirit and humbleness of purpose its Founder inculcated; but certainly it may be laid down as axiomatic that the same Christian feeling must run through all our Christian edifices. Surely God is as much present in the company gathered to worship Him in this lowly edifice as in the grandest cathedral of Europe. So all our churches need this element to mark them as set apart for a consecrated purpose. And the item of cost has naught to do with it.

The church shown in Figure 8 is an unsuccessful effort to obtain an ecclesiastical effect in that style popularly called "Old Colonial." It is unsuccessful because in the tower and the window beyond some elements are introduced not in harmony with the other parts of the design. Yet here, as in all the instances we have seen, it may be asked, Is this a church, and why? And quite as promptly the answer would be, Because of its tower and the window aforementioned. Into the ecclesiastical character of these parts we need not inquire, because if we separate them from the rest of the picture it will at once be seen they have none at all. It is only when they are combined with the other parts, which in themselves have no religious meaning, that a combination is produced that suggests a church, and chiefly because it suggests no other structure. Of an idea of a church as a church, of a whole building, every stone and board of which speaks of Christianity, there is no hint.

Nor is there more in Figure 9. It is difficult to avoid recognizing the awkward architectural forms employed in this design, and certainly it is evident there is nothing in it which stamps it directly as a church and nothing else. The tower, on which so much dependence is usually placed, is distinctly unecclesiastical in form, as it is un-Christian in meaning. Nor are the windows much more suggestive of holy things. It is a design entirely devoid of Christian feeling, and might, so far as the external architecture is concerned, be put to half-a-dozen uses rather than set apart for the preaching of the gospel and the glorifying of God.

And surely the same may be said of Figure 10. Here is another strange tower introduced, apparently, to distinguish the building as a church, though it contains no other feature that suggests its purpose. Look at the picture as you will, be as prejudiced in its favor



Fig. 13.

as you may, and its distinctively unreligious nature will be apparent at every glance. It may, for all I know to the contrary, be admirably suited to the needs of the congregation that worships within it, but this does not alter the fact that, as a building, it does not sug-

gest Christian ideas, nor does it point out the holy and sacred uses to which it is dedicated.

The church shown in Figure 11 belongs to the same class. The predominance of the chimneys in this design, and the varied outline of the plan and roof suggest a very multiform use for the building, quite as much as it suggests any ecclesiastical purpose. The tower is an open belvedere, seemingly erected for purposes of observation, and has not even that attempted ecclesiastical form we have seen in the designs previously noted. In no sense is this distinctly a church—a church and nothing else, a church speaking of God's message to mankind and the sacredness of its uses. A structure arranged within to suit the requirements of a certain form of worship, it completely fails to express the exalted character of these ceremonies in its architecture. Like all the designs we have seen, it might as well be anything as a church, and it thus avoids, with very great success, the first elements of Christian architecture.

Nor does the building, shown in Figure 12, which was designed for a Unitarian Church. There is a certain novelty in this design which gives it an attractive air, yet there is nothing Christian in it, nor does it suggest a sacred structure. The novelty of its form, the strangeness of this vast rectangle with a domed circle protruding from it in an unexplained manner, destroys its Christian character quite as much as the absence of a Christian novelty in its architecture. We do not need novelty to mark off our churches, for surely here, as in many other instances we have seen, it is needful to ask, To what use is it put? before we can rightly classify it. Such a necessity is foreign to true architecture, which can tell the most complicated tales in the simplest manner. A church cannot be made a church by being designed like no other building on earth.

Figure 13, which is a design for a Mission Chapel, belongs to the same group. Might this not as well be a gymnasium or a public library? Would we know this to be a church without entering it or seeing its plan or being told what it is? The label the architect has conveniently inserted on the left of the main entrance scarcely tells the story, since modern missions are of many sorts, and not a few of them do not use a structure set apart for worship.

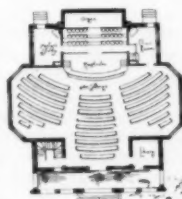


Fig. 14.

Figure 14 shows a design for a Methodist Church. Here is a picturesqueness akin to that seen in Figure 12, and here as elsewhere, we must ask, To what uses is it put? An architect who could build four towers to a structure so circumscribed in area as this must have had ample means at his disposal to produce a monumental design. Yet his object, obviously, was to produce something novel—in which he certainly succeeded—without in the least asking himself if the result was churchly and Christian, and if it adequately expressed the majesty and power of the Most High. That he has utterly failed in this must, I think, be apparent to every one who will keep this elemental principal well in mind when studying this design. And it must be confessed that in this neglect he has but followed the ordinary practice of the majority of his fellows.

BARR FERREE.

[To be continued.]

PREVENTION OF STAINING OF PLASTERING ON DAMP WALLS AND FIREPROOFED SURFACES.¹

WHEN, in the early eighties, the use of hollow, hard-burned, fire-clay blocks first began to be general in New York City for fireproof surfaces, that is, for filling-in floors between iron beams, for building interior partitions and for furring walls, it was soon noticed that the plaster, particularly in the ceilings, began to show curious spots.

In some cases the ceiling would be discolored here and there, in others there would be a white, fuzzy growth apparent, which on testing would be found to be some soluble salt.

The first conclusion generally reached was, that water must have been spilled and, trickling through, made the stains, and that the

¹ A paper by Mr. Louis de Coppet Berg, F. A. I. A., read at the Twenty-ninth Annual Convention of the American Institute of Architects held at St. Louis October 15-17, 1895.

dampness in combination with the salts and chemicals in the materials through which it had been, formed this growth. Of course it was a simple matter to wipe off the ceiling and then proceed with the preparatory coat and the kalsomining, only to find that the kalsomine would at once discolor under these spots, and later frequently in many other places. Oil paint did not remedy the trouble, for even where three or four coats of oil paint were put on the discoloration and spots would come through.

I can remember distinctly the many different guesses and theories which architects and practical builders indulged in. The first thought, of course, was that the plastering had not been allowed to dry out long enough. Later, the spots were ascribed to dampness remaining in the concrete. Then, as cinder concrete began to be used, other wisacres thought it was due to something in the cinders. This theory, however, was not entirely tenable, because the same spots would be found in the vertical partitions and furrings, where certainly no cinders came in contact with them.

This led to the suggestion that it must be either something in the mortar, of which the joints were made, or else something in the clay, of which the blocks were made, for it certainly could not be in the plaster itself, which when applied to wooden furrings and lath, or to iron lath, did not show these spots, but only when applied to fireproof work or to damp walls. Of course, it once being ascertained that these spots were unavoidable, the next thing to do was to find the remedy.

Some fifteen years of research in this line, however, have shown that it was not an easy thing to do. In some cases the remedy apparently would work and then fail in others. The remedies suggested were of various kinds; such, for instance, as washing the plastered surface with diluted chemicals, a solution of alum being a great favorite for a time. Another remedy was to shellac the spots or to shellac the entire ceiling; but in most cases the spots came through the shellac. Others were to apply patent preparations, such as "Duresco" or "Lithogen" for the first coat. Again, the use of cold-water paints or patent paints was suggested. But all of these remedies were so fallible, that a prominent New York architect, when once asked how long it took before one could safely decorate on fireproof work, replied: "About ten years," and he, apparently, was not far from the truth.

The writer believes, however, that now a permanent and successful remedy has been found, and to lay this before you is the object of this paper. Its discovery was accidental and it was this way:

We were doing a large building for Yale University, — the new Sheffield Scientific School Chemical Laboratory — and while we could not afford fireproof work, wooden furrings on the outside walls had to be avoided for practical reasons, as most of the hoods, fires, etc., were located against the outside walls. In this dilemma we suggested coating the walls with tar, and plastering directly on the tar, a well-known practice. The building was put under contract and all measurements for the constructional parts and the furnishings made on this basis, when the Professors in charge of the work began to have fears in regard to the use of tar on the walls, on the score that the live-steam pipes and the hood would subject the plastering to so great a heat, that they would melt the tar behind the plastering, and let the plaster down.

Experiments made in this direction proved them to be right — that while the plaster would cling to the tar perfectly, it would lose its hold when the surface of the plastering was thoroughly heated.

In this emergency something had to be devised. It was too late to attempt any furring of the walls, even if the expense had not to be considered. After a number of consultations, it was decided to try the use of asphalt varnishes in place of the tar, hoping that they would be so much thinner, that is, have so much less body, that they might not melt under the influence of heat applied to the plastered surface. All of the various asphalt varnishes which could be obtained were bought and experiments made. It was found, however, that some were so thin that they soaked into the brick, leaving no damp-proof surface; while others had so much body that they (like the tar) would melt and allow the plastering to sink down when the latter was heated.

At this stage of the experiments, Prof. H. L. Wells, of the University staff, undertook experiments on his own account, and succeeded in producing an asphalt varnish, which could be easily applied cold to a wall surface, and which was yet so fluid that it would run all around a grain of sand or into the slightest indentation in the brick or mortar, making a perfect continuous asphalt coat over the entire surfaces; that is, reproducing in the asphalt *exactly* the same surfaces that had been there before it was applied. The asphalt was not absorbed by the brick, nor did it thicken in places. The result of having practically the same surfaces (as on the bricks and mortar) for the plastering to take hold of made it adhere very thoroughly; while the asphalt itself, being so thin, it was found impossible to melt, when experiments were made in that line. After the plastering had been allowed to set very hard, pieces were broken out with a hatchet, and, in many cases, a piece of the brick would come off with the plaster. On examining the broken edge, the asphalt could not be seen, so thin was the coat; yet, when the brick was carefully picked off there would be the perfect coat of asphalt between them.

After numerous experiments, it was finally decided to use this material, which the Professor very aptly named "Antihydrine."

The antihydrine proved a success far beyond our expectations,

some of the results being quite startling. The scratch and brown coats of mortar on the exterior walls, owing to the fact that the only dampness in them was the water in the plastering itself, dried out very quickly; and dried out of such a perfect and even color, that the brown coat looked very much clearer and better than the hard finished plastering on the interior brick walls, which had been done before the decision as to how the exterior walls should be coated had been reached. These interior brick walls were not heavy walls, and as they had had heat applied to them on both sides for several months before they had been plastered, it was rather surprising to find that they should spot up so badly, while the exterior walls, (to which, of course, the antihydrine had been applied) dried out so beautifully and smoothly.

After the hard finishing had been put on the exterior walls, a constant watch was kept upon it to detect the first signs of staining, but none whatever appeared, proving distinctly that as a waterproof furring material for outside walls the antihydrine was a success.

This at once led to the suggestion that it might be a good material to stop the staining of plastering on fireproof work.

Experimental arches of fireproof blocks were built, covered with antihydrine on the under side, and then plastered, while cinder concrete was placed on the upper side and kept moist; no staining whatever occurring in the plaster, which dried out perfectly.

Since then, in all our fireproof buildings, we are omitting furrings entirely, covering the walls with antihydrine, also similarly covering all fireproof surfaces of partitions, ceilings, etc., before plastering.

Further uses of this material suggested themselves as follows:

When certain walls in the cellars of the building were whitewashed, the whitewash at once discolored from the dampness in the walls. It was decided, therefore, to use the antihydrine on some of the walls that had not yet been whitewashed, and it was found that on these the second coat made a beautiful white finish entirely free from stain. This at once suggested the application of the material to already hard-finished stained plastering as an under or preparatory coating for painting or kalsomining; the idea being, that in buildings where the plaster was already discolored, this material might be used on the surface of the plaster. These later experiments, however, proved entirely unsuccessful, neither the paint nor the kalsomine working well, where the antihydrine was applied to the outside surface of the plastering.

The next suggestion for the use of the material was in connection with limestones, marbles and similar cut stonework, where it is necessary to protect the delicately-colored stone from the staining, due to the use of cement in the mortar of the backing-up joints. Experiments made proved it to be successful. By painting the bottom bed of the lowest layer of stones with the antihydrine, painting the back of each course (and the joints) as they are laid, the use and expense of LaFarge cement in the backing can be avoided, ordinary mortar being used instead.

The method of using the antihydrine is very simple; it is done up like other varnishes in cans, which are opened as needed, the contents poured into pails and the material then applied to the surface with an ordinary whitewash brush; it requires no skill whatever for its application. An apprentice or common laborer can do the work. A gallon of the material covers about 100 square feet, the cost being about one and one-fourth cents a square foot, not including the cost of labor, which would vary in different localities, but does not swell the cost seriously. Of course, the saving of the fireproof furring more than offsets the cost of the antihydrine itself on exterior walls; while on fireproof work the advantage of being able to retain a perfectly white surface in those buildings — for instance, where no painting is to be done — or of being able to paint and decorate without risk, is well worth the cost.

There is a curious difference in the method of using the material; for instance, where plaster is to be directly applied to it, experience so far has indicated that it is better not to put on the antihydrine until the last moment, say within twenty-four hours of applying the first coat of plastering, so that the material may be still soft or "tacky" when the first coat of plastering touches it. The plastering will adhere to it when dry, but it seems safer and better to put it on the still moist material. The first coat of plastering should in every case be a scratch coat and be put on as thin as possible to get through scratching, and allowed to dry thoroughly before applying the brown coat. In the case of whitewashing, exactly the opposite seems to be indicated. The antihydrine should be put on as long in advance as possible and allowed to dry thoroughly. Even then the first coat of whitewashing seems to creep and not to take hold very well, though the second coat will fill out the crevices and make a good finish.

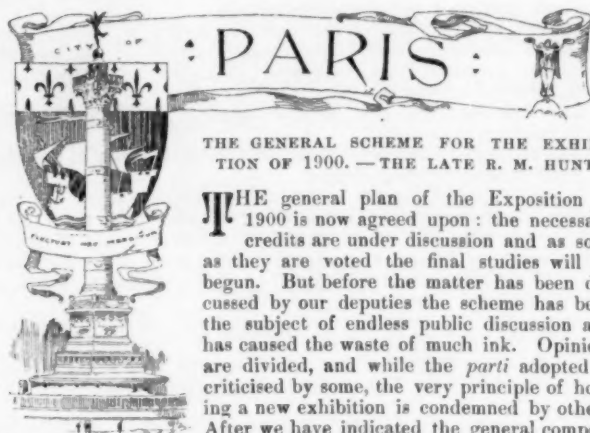
When applied to the back of stone the backing up can be done immediately after the antihydrine coating has been put on, providing, of course, care is taken not to damage it.

Of course, the material is new, having only been discovered last winter, but the writer is using it very extensively in his practice, and has perfect confidence that it will continue to act as it has done so far in its career.

There are additional uses to which the material might easily be put; but these, not having been used in actual practice, should be subjected to experiment before being used on any extensive scale. For instance, for damp-proofing in old walls, where it was impracticable to dig up on the outside, it would seem that this material applied to the inside should remedy the trouble. Again, for damp-proofing

cellar bottoms, which are slightly damp and moist, it would seem that a smooth coat of concrete, thoroughly covered with this material and then protected on top with an additional layer of concrete or cement, should prove a cheap and good water-proofing material. Even where there is pressure of water, it might possibly answer, providing sufficient weight were put upon it.

As a final warning, it should be said that in every case where the material is used, before covering it in with plaster, whitewash or other substance, the surface should be carefully looked over to see that the workmen have uniformly coated all parts; as, of course, any small part omitted would allow dampness to come through.



THE GENERAL SCHEME FOR THE EXHIBITION OF 1900. — THE LATE R. M. HUNT.

THE general plan of the Exposition of 1900 is now agreed upon: the necessary credits are under discussion and as soon as they are voted the final studies will be begun. But before the matter has been discussed by our deputies the scheme has been the subject of endless public discussion and has caused the waste of much ink. Opinions are divided, and while the *parti* adopted is criticised by some, the very principle of holding a new exhibition is condemned by others.

After we have indicated the general composition of the plan adopted, it will be possible to answer the first class of critics and then to discuss the position of those who believe we should hold no more international exhibitions. This last is rather a radical belief to hold, and I confess I do not share it, while I understand it and find that the reasons for the belief can be defended. Those who oppose the Exposition of 1900 — and many notable men can be counted amongst the opponents of the scheme — attest the too frequent repetition of these gatherings and deplore their abuses. Each year one hears of one or more of these exhibitions, the success of which is doubtful at the start, while the most positive result is to weary the public with identical manifestations, to say nothing of the manufacturers who receive only negative benefits after having met considerable expenses. There is, then, a distinct feeling of weariness which must be taken into the account in the future, a weariness which this year is manifested in characteristic fashion. Articles have appeared in the daily papers which have swayed public opinion, but it ought to be said that the greater part of these articles, although some of them are very bright, rest rather on literary paradoxes than upon serious ratiocination. The arguments advanced in a Paris journal by a boulevardier who dreads to have his comfort disturbed by the mob of foreigners who will invade Paris are not to be taken seriously. But one must give greater attention to the protest of the "Ligue de Décentralization," of Nancy. This league, some time ago, sent to all the Conseils Généraux of France a proposal that all should join in a protest against the Exhibition of 1900. This suggestion, that may have been instigated by electoral reasons or by local interest, was coldly received, even the Conseil Général of Nancy itself contenting itself with demanding that an inquiry should be made as to the opportuneness of holding the exhibition, while only three Departments gave the suggestion any consideration. Such manifestations as these give the promoters little uneasiness, so far as this next Exhibition is concerned. But it would be wrong to take no account of the movement that is beginning against the too

great frequency of these international shows, for it may possibly happen that the Exhibition of 1900 shall be the last of the series. This very possibility is a reason for holding it, and a reason for making it exceptionally grand, so that it may be the apotheosis of the closing century, the solemn review of its genius and its progress. It would be also a reason for approving the scheme of M. Picard, the Commissioner-General, in all that concerns the construction of the new buildings which are to be erected on the Champs Elysées, and the final transformation which must leave, after 1900, in that part of Paris which is now so fair, a grand and monumental aspect and which should date an epoch in its history.

But such results cannot be had without certain sacrifices which are repugnant to narrow and routine minds, minds hostile to all that is new, whatever it may be. Such are those who criticize the scheme that has been presented, the scheme we are now going to examine. The report of the Commissioner-General tells us that the utilizable area will approximate 108 hectares, while the floor-area of the several buildings and pavilions will be about 39 hectares as against 26 in 1889.

In spite of this increase of floor-space, the desire to leave for the public extensive parks and gardens and also certain motives of economy have caused the introduction, in several places, of exhibition-halls in the first story. In spite of all the ingenuity that can be displayed in making these up-stairs halls easy of access, I believe that they are making a mistake in this arrangement which experience ought to have caused them to avoid.

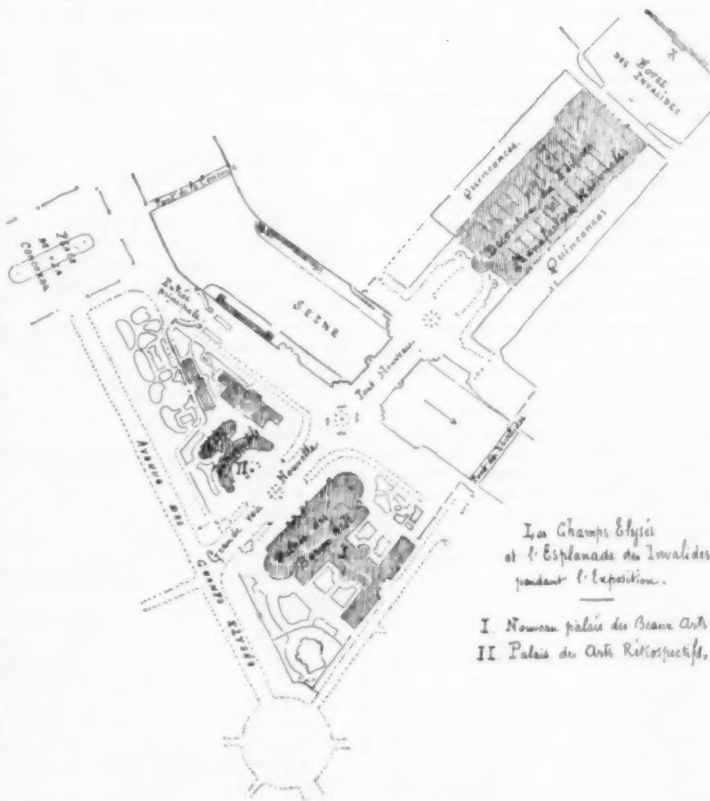
The great question to be settled at the very outset was whether to preserve or to destroy the Palais de l'Industrie, for upon its solution depended the execution or the abandonment of the wide new roadway which should open from the Avenue of the Champs Elysées the perspective of the Esplanade des Invalides and Mansart's dome.

This *parti*, which was adopted by certain of the competitors at the time of holding the original competition,¹ made a great impression on the jury, and the Commissioner-General and his coadjutors came to feel that this solution was imposed on them. "Whatever may have been the usefulness of the Palais de l'Industrie," said Mr. Picard with much justice, "no one can defend its artistic merits very strenuously. No one will fail to recognize the unfortunate position to which it has been assigned. From the very day it began to rise above the ground the critics cried out against the destruction of one of the finest perspective views that Paris afforded, and condemned this heavy and compact mass that was being interposed between the Champs Elysées and the dome of the Invalides."

Yet now that it is wished to restore to Parisians this fine view and replace the old palace — which in any case would have had to undergo costly alterations — by a new building, finer and better suited to its purposes, lo and behold there appear a certain number of Parisians who cry out, "To the rescue! Help!" declaring that their Champs Elysées is about to be devastated. But do they really know just what it is proposed to do?

The new promenade opening from the Champs Elysées on the axis of the Invalides would cross the Seine by a monumental bridge 60 metres wide. On the right, looking toward the Invalides, would be the Palace of the Fine Arts, while on the left and facing it, but of smaller dimensions, would be the building of the Retrospective Exhibition of French Art. These two buildings and the bridge, which are to be the subject shortly of a public competition, would be the only permanent structures of the Exhibition. This fair group would be set off by porticos, exedras, shrubberies and flower-beds. The bridge would be built of cast steel.

The chief entrance to the Exhibition would be from the Cours la Reine at the side of the Place de la Concorde, and visitors would find on the bank of the Seine a broad avenue adorned with terraced gardens leading to the Palace of the Fine Arts just mentioned. Across the bridge and near the river, on the Esplanade des Invalides, would



¹ See American Architect for Feb. 9, 1895, No. 998.

be built a series of palaces for those groups which are allied to decorative art. Thus the region neighboring to the present Palais de l'Industrie and the Esplanade des Invalides would constitute the domain of art.

Between the Pont des Invalides and the Pont de l'Alma on the right bank of the Seine would be placed the building of the City of Paris, the Horticultural Building and the Palais de l'Economie Sociale et des Congrès. On the left bank, in front, would be the pavilions of the foreign powers, isolated and varied in form so that they would constitute a superb framing for the Venetian fêtes. Next to the foreign pavilions would come the buildings of the Army, the Navy, the Merchant Marine, Forestry, Hunting, Fishing, etc.

The Trocadéro would have the Colonial exhibits and, finally, the Champ de Mars would be given up to Manufacture and Agriculture. Two ranges of buildings of the same general aspect, yet having characteristics suited to different groups, would be placed *en echelon* along the Avenues Suffren and La Bourdonnais, leading up to an immense *château d'eau* with its cascades, and to the Palace of Electricity. Each of the buildings would accommodate on the outer sides the raw product and on the inner sides the manufactured results, while the centenary exhibits could find their proper places in the transverse galleries that separate the several groups. The entire circumference of the gardens surrounding these buildings would be arranged in terraced porticos admitting of circulation above and below.

The Machinery Gallery of 1889 would be preserved, but both the form and the use to be made of this building would be modified. At the centre would be the Salle des Fêtes, of which the Electricity Building would serve as the brilliant vestibule. As to the Eiffel Tower, it will be allowed to remain. Many of the competing architects attempted to use it in their designs in a modified form, but no satisfactory treatment was devised. As to entire suppression and removal, that, unfortunately, can be brought about only by paying a heavy indemnity to the society which owns the concession.

These are the general lines of the plan that is to be submitted to the Chamber and for the execution of which twenty million dollars will be needed.

The preliminary report of the Commissioner-General, from which these facts are drawn, does not enter at all into details, but leaves ample opportunity for private suggestion and inventiveness.

I do not wish to close this letter without making known to our American *confrères* the feeling that has been aroused here by the death of Mr. Richard Morris Hunt, and I will make a few extracts from an article devoted to him in *L'Architecture*, the journal of the Société Centrale des Architectes Français.

"The disappearance of an artist of Mr. Hunt's worth is a considerable loss to art, particularly for that essentially French art, which the much-regretted master had, more than any other, aided in implanting, and causing it to be loved, in the United States. . . . He came to France after having made good progress in his studies at Geneva, to complete them at the École des Beaux-Arts and was later employed on the works of the Louvre and Tuileries as inspector. Every one knows in what esteem he was held by Hector Lefuel. . . . Mr. Hunt was one of the architects who contributed most to give to the World's Fair at Chicago in 1893, that character for grandeur which has been attested by all who visited that Exhibition. . . . The name of Mr. Hunt was well known on this side of the Atlantic. He was recognized everywhere as a master and his reputation was only increased by the homage that was justly accorded him in Europe. In 1887 Mr. Hunt was elected Corresponding Member of the Société Centrale des Architectes Français, then, later, he was made an Honorary Member of the Royal Institute of British Architects and, later still, Corresponding Member of the Society of Engineers and Architects of Vienna." Following a further enumeration of the titles and honors he had won, the article closes thus:

"Professor of great eminence, Mr. Hunt had the forming of many pupils, who, at the present time, hold the first rank amongst American architects. A charming and witty companion, overflowing with frank cordiality, Hunt counted many friends and comrades amongst French architects. All will regret him and long bear him in memory. Every one knows that Richard Morris Hunt was the leading spirit in bringing about the foundation for the pupils at the École des Beaux-Arts of the Prix de Reconnaissance des Architectes Américains."

ELECTRIC HEATING.¹

COLD transmission of electric energy means the economical transfer of power.

The heating of any part of the system of wires or other conductors, whether in the battery or the mechanical generator from which it starts, or elsewhere, is waste or loss in proportion as the temperature is raised in the various mediums of transfer.

A conducting medium requires to be no less in capacity than its necessities, to carry electricity with the highest economy.

It is, therefore, apparent that if cold transmission is economy, to obtain heat is at expense (not to say, however, that even cold transmission is free from cost, in loss, and a small amount of heat).

It is likewise apparent that if freest transmission is freest of heat, that impediment or resistance to transmission is a method for obtaining heat.

This fact is utilized where heat is required.

The proportion of heat developed is related exactly to the blockade to the free transfer of electric energy; the blockade, therefore, may be designed in exact proportion as to the heat desired at any local point.

Joule found the number of units of heat developed in a conductor is proportional:

- I. To its resistance;
- II. To the square of the strength of the current;
- III. To the time the current lasts.

The blockade to flow, better known as resistance in the circuit, may be placed just where the effect is desired.

The commonest illustration, and by the brilliancy of its effects the most striking, is the incandescent-lamp.

Modern invention has so perfected the system of lighting, that an entire installation may, to the casual observer, be cold throughout every appliance from the power belt to the last lamp, except in the little wicks themselves.

The little lamp has heat in it, in spite of the old name given to it, "light without heat."

The ordinary incandescent-lamp itself is utilized now as a heater of small capacity and requirement.

One may buy a tea-pot, constructed to enclose under the tea-vessels an 8-candle-power lamp, which is sufficient to keep up a temperature agreeable to the afternoon-tea server. Or a 16-candle lamp will keep boiling water at the boiling-point, or in the same utensil a 50-candle lamp will raise two or three pints of water to the boiling-point in twenty-five minutes.

This use of the small electric lamp is simply an effort to obtain something unique and exquisitely cleanly for such a purpose.

We have all observed that waste or radiated heat is exceedingly small compared with older forms of lamps, such as that of oil and gas.

In 16-candle-power, while the incandescent-lamp will raise 14 pounds of water 10° Fahr. in the heat given off in an hour's lighting, a kerosene Argand burner will raise to the same degree 331 pounds, or nearly twenty-four times as much.

Certainly the incandescent-lamp filament cannot be looked upon as a factor in designing an article for commercial heating. Its cost as a heater would many times exceed the usual methods.

It may be observed in passing: Much has been done in the search for a cold light, and some surprising results have been attained in the use of vacuum tubes, giving many hundred times the efficiency of the common incandescent-lamp. In it the electric alternating current of high frequency is used.

So that, as the glow-lamp, hot as it is, was welcomed as a "light without heat," we may not accept too much to look forward to the vacuum tube and the electric alternating current for a greater stride towards an absolutely "cold light."

The temperature rises quickly in the incandescent-lamp wick because of its fineness and short length. The nature of the resisting medium has to do with the rise of temperature. Platinum was early used for lamp wicks; its nature differs greatly from many metals as a conductor of electric current and likewise as a conductor of heat. Comparing it with silver: the capacity of silver for heat is twice as great, but the specific resistance of platinum to flow of current is nearly seven times as great as silver.

The rise of temperature, therefore, as between these two metals under similar conditions, would be about 12 to 1 in favor of platinum.

Therefore, in selecting a resisting medium for local heat effects, one must use wisdom, being governed by efficiency of metals and with a proper view to their cost, etc.

We have referred to the incandescent-lamp as an illustration of heating effect, and shall later use the principle set forth by it in other connections.

The electric arc, however, furnishes us the highest type of electric fire with which we have any familiarity. Just here we must express the wish that our Club may soon have, as a part of our paraphernalia for experimental purposes, all the varieties of electric current "on tap"; for had we access to an arc circuit now, we might place upon the screen the arc, and at our leisure study it. We would find in it "a thing of beauty" and an instructive physical phenomenon.

As early as 1878 it was my pleasure to talk to a vast audience, with a projection of the arc on the screen, where the $\frac{3}{4}$ -inch carbons were shown 16 to 20 inches across.

It was a wonder then as we looked at the ebullition of the carbon and speculated as to its power, and prophesied about its future.

Since then we have been instructed concerning the steady habits and constant principles of the artificial orb.

Doubtless the greatest heat obtained by electric energy is that developed in the electric arc.

While the name, which Davy gave to the stream of pulverulent carbon projected across the space between the carbon rods, has attached itself to all lamps of its class, it must not be understood that the arc itself is the source of the illumination or the seat of the enormous heat (the chief cause of light).

When continuous currents are used, the light is chiefly due to the intense heat on the surface of the positive carbon, which is heated and wasted about twice as fast as the negative.

The negative carbon has also great heat, and consequently emits

¹A paper by J. Chester Wilson, read April 20, 1895, before the Engineers' Club of Philadelphia and published in the *Proceedings*.

some light. In the positive carbon the white heat of the crater may be obtained by a smaller electric current than 5 to 10 amperes, and 40 or 50 volts, usually employed. Both Violle and Thomson agree that increasing the voltage or current beyond the point of volatilization of the carbon does not increase the color or intrinsic brilliancy of the light, a uniform lightness of the crater surface is maintained in pure carbon, even should there be variation in the potential.

An increased current and pressure will burn away by oxidation more carbon and lengthen the arc and widen the crater surface, from which the increased brilliancy is emitted.

Violle attempted to measure the temperature of the arc, and has decided it is about 3,500° Cent., which is simply the point of volatilization of carbon.

In this intense heat, platinum and gold are vaporized readily, and the diamond as readily fused. The first use of the arc was not for its lighting power, but for heating.

It is fifty years since Cowles first used the heat of the arc in a reduction furnace for obtaining aluminium copper alloys. He depended upon the heating effect alone and procured only alloys. His furnace was simple. Later workers use both the heating effect and electrolytic effect.

Herauld uses another form wherein one pole terminates in the usual carbon rod, while the other is shaped to be a crucible of carbon; 12,000 to 15,000 amperes of current are used, and a low voltage.

The charming feature of an electric furnace is the advantage of being able to introduce the necessary heat to the inside while the chamber is hermetically sealed, and utilize the heat there.

Combustion of foreign material in large quantities, as the necessity is in other furnaces, is eliminated to the advantage of the ore or metal being treated, preserving its purity after being reached.

At the present time the Patent Office is receiving a great many applications for furnaces, especially wherein the electrolytic effect is taken advantage of, and a variety of chemicals are recited as being effective for various operations.

But a few years ago aluminium was sold at \$100 per pound; now it is being utilized in the manufacture of a vast variety of things, wherein there is a profit at 75 cents per pound. (The market value of the metal runs to-day from 45 cents for least pure, up to 65 and 70 cents per pound for the best.)

In domestic heating it is found the commercial efficiency of the coal cooking-range is as low as between 3 and 6 per cent. (*Electrical Engineer*, March 7, 1894.)

Another investigator (*London Society of Engineers*, November 6, 1893) gives it from actual experiment as 4 per cent, and shows but 1 pound of coal in 27 is actually effective.

Hedaway says (*Electrical Engineer*, March 7, 1894) the heat efficiency of the average moderate-sized central station is about 6 per cent, and this is a sufficient margin to warrant the use of electricity as a source of heat in domestic life. This low efficiency is based on figures of no advantage to this branch of commerce, and would, of course, be improved with apparatus of proper size and planned for higher working economy where apparatus and tools are all more regularly employed.

The lamp rates, now generally prevailing, will preclude this branch, but a heat rate which will be evolved as a demand re-designs central stations will bring about this model heating. The cleanliness, regularity, convenience and healthfulness will down many of the objections to higher rates, especially in earliest stages of its introduction.

The power rates of the Edison central-station companies, with the discounts allowed to large users, is equal to 5 cents per horse-power hour. In the Electric Kitchen, in New York, on an eleven weeks' trial, at the 5-cent rate per horse-power hour, an average of ninety-seven persons were served at an average cost of 2.5 cents each for the heat.

Every form of industrial work is undergoing change in this particular.

A 7-pound electric laundry-iron requires about 330 watts for a far more efficient and economical service that can be otherwise had, that is, with the old furnace of coal or gas. In such a service more elements enter into cost or economy than are at first appreciated. In electric laundering, the continued readiness by constant temperature, avoidance of over-heated room for operators, and the all-important matters of cleanliness and safety must be considered.

I here exhibit a laundry-iron which has been torn apart for your inspection. The current passes through the coils contained within and offers such resistance that sufficient heat is generated for the work. The mechanical design is worthy of an inspection.

These are practical and are largely in use in this city and elsewhere. I have just inspected their working in a clothing-house, where, I was told, they are there to stay and more are wanted.

Another appliance meeting with popular favor is the electric glue-pot; one is here exhibited and will be admired upon inspection.

NOTE. — Wm. Mann Co. has a large battery of these in the bindery and praises their efficiency.

On the usual 110-volt incandescent-light circuit, about 2 amperes are used in heating and maintaining working conditions, being equivalent to about two glow-lamps.

Another happy combination, wherein the arc is used for an

industrial tool, is found and here exhibited in the electric soldering-iron.

Through the wooden handle passes the current by flexible conductors, one side of the current reaching the soldering point by way of a central carbon rod, which is adjusted by the back screw to touch or be withdrawn from contact with the inner part of the copper tip piece, which is connected with the inner side of the current by the sheathing-tube.

This also is a practical tool. It requires 3 to 7 amperes, and on a 110-volt circuit a resistance is connected in of about 17 ohms.

Probably the greatest attention in heating, looking to personal comfort, has been given to passenger street-car work.

Here the application is greatly simplified by the presence on the car of the needed source, in the greatest convenience.

Connections on the line may be had by simply tapping it on its way to the motor and with the coils of properly regulated resistance, to develop the needed amount of heat, placed in position to interfere in no way with the seating.

Usually the space under the seats is utilized, and in some forms of heater the space below the rolled edge of the seat and on the face of the seat-front is sufficient. Others are designed to replace the panel and be suspended under the seat.

They are usually constructed to be brought to the temperature wished with about 5 to 9 amperes of current, depending, of course, on 500 volts electromotive force.

As to cost, one expert of the Edison Company has published the figures of a series of careful tests. The running expenses are from 12 cents to 18 cents per car day.

He also states for comparison that car-stoves cost 20 to 35 cents, or about double.

TWENTY-NINTH ANNUAL REPORT OF THE BOARD OF DIRECTORS, AMERICAN INSTITUTE OF ARCHITECTS.¹

YOUR Board of Directors has held three meetings and the Executive Committee one meeting during the year.

They have received and accepted the resignations of nineteen Fellows, and have requested others to withdraw their resignations: they have opened three letter-ballots and found that you have elected seventeen new members, one of those proposed having been refused an election by eleven negative ballots. Twenty-one members have been dropped from the rolls for long continued delinquency in the payment of their dues.

The year's experience under the amended by-laws has clearly shown how difficult it is for a Committee of the Institute to formulate a scheme which in practice will prove to be satisfactory to the Fellows. For a number of years it has been considered, to quote the words of our late honored President, Richard M. Hunt, "that the strength of the Institute lies in its Chapters," and that everything possible should be done to encourage the formation of Chapters, to promote their growth and keep them in close touch with the Institute. To promote these ends, the whole question of the relation of the Chapters to the Institute was referred to a very able and representative Committee who gave the matter prolonged and careful consideration and presented to the Convention in New York last year suggestions for amendments to the by-laws, which would make them very complete and harmonious, and based upon the closest possible connection of the Institute and its Chapters, making a certain class of membership in the latter impossible for one who was not a Fellow of the Institute. The Convention adopted the proposed amendments with but little opposition, but with some misgivings, and from all quarters your Board of Directors has had communications, showing such a deep-seated opposition to the same that the Committee feel that their intent has not been fully understood, and they desire that your Board should say that their plan contemplated for all Chapters, at least four grades of membership:—

- (a) A first grade of Practising Members.
 - (b) A second grade of Associate Practising Members (being those admitted under Section 3 of Article 10 of the by-laws).
 - (c) A third grade of Associate Members.
 - (d) A fourth grade of Junior Members.
 - (e) And other such further grades of Honorary, Corresponding, Life or other class as each Chapter may choose to create.
- (a) The first grade, or Practising Members, should hold all the property of the Chapter, should alone be eligible for election to the offices for the government of the Chapters, should alone have power to vote as to the membership of its own grade, and should for its distinction and extra privileges pay a higher annual due than the members of any other grade, their suggestion being that they should pay double the dues of those of the second grade. Members of the first grade may or may not be Fellows of the Institute, but as many of them will have advanced to this grade from the second grade (where membership in the Institute is compulsory) they may believe that none would relinquish their membership in the Institute when they become first-grade members of Chapters.

(b) Those only are eligible to the second-grade membership who have conducted business, as principals, for at least three years and have been proposed and elected Fellows of the Institute, and as

¹ Submitted to the Convention at its first session, October 15, 1895.

these men would probably be among the younger men of the profession, it was intended to place their Chapter dues so low that they would not feel it a burden to pay also their Institute dues.

Your Board would take the liberty here to suggest that the fixing of the dues of this grade of members at a uniform rate of \$5.00 for Chapter dues was probably the cause of the misunderstanding on the part of the Chapters, of the Committee's scheme. This sum is as large as many of the Chapters' highest dues, and is in excess of some others. Had the Committee given each Chapter the power to make the dues of this grade of Chapter members one-half of the dues of the first-grade members, it seems to the Board that the amendments adopted last year would have received the support of all who opposed them.

In considering the amendments proposed this year, your Board asks you to give due consideration to the views of the committee which formulated the report of last year, and trust that such wise action will be taken as will result in adopting by-laws which will eventuate in the best interests of the Institute without the necessity for an annual revision.

It has also been found in practice that it is very difficult to get the work of the Institute done by so large a body as twenty-nine men.

A letter-ballot was consequently sent out, with a view to making a Board of officers to manage the affairs of the Institute, to consist of the President, the Secretary, the Treasurer and four other men, but an insufficient number have voted to signify the wishes of the Fellows in this matter, and a new ballot has been ordered.

There has been an application for a charter for a Chapter, to be called the Texas State Chapter, which has been granted by the Board of Directors after a prolonged correspondence growing out of the fact that there were a number of men, not Fellows of the Institute, who also wanted to form a Chapter, and wished to be admitted in a body as Fellows of the Institute without subjecting themselves to individual letter-ballot, which it was not possible, under the by-laws, for the Board to grant.

It is not necessary for the Board to repeat the familiar history of the practical defeat of the McKaig Bill by the non-action of Congress, of the resignation of Mr. O'Rourke from the office of Supervising Architect, for reasons which reflected great credit upon his official action, of the tendering of the office to Mr. John M. Carrère, and his declining to accept it after a careful survey of its opportunities and responsibilities, handicapped as they were by want of real control, and of the selection for the position of Mr. William Martin Aiken, a Fellow of the Institute, honored and respected by all who know him.

The President has, by direction of the Board of Directors, appointed R. M. Hunt, C. F. McKim, George B. Post, Robert Stead, James G. Hill, Bruce Price, John M. Carrère, Alfred Stone, Cass Gilbert, Louis H. Sullivan, a committee to investigate and report upon the present method of designing and erecting United States Federal Buildings, and to report upon the best method of elevating to a higher standard the architecture of such buildings, with instructions to report the same to the meeting of the Board of Directors which was held yesterday, but the sickness and death of Mr. Hunt, who was named as Chairman of the Committee, has prevented a meeting of the Committee, and, therefore, the President has continued the Committee with instructions to report to the Board at its meeting in January, 1896.

At no time in the history of the Institute has the question of the ethics of the profession been as frequently and so constantly under consideration and discussion as during the last year. Your Board does not, therefore, feel that the standard of professional practice has been deteriorating and that unprofessional conduct is more in evidence than formerly, but rather that higher ideals have obtained, and lapses from professional conduct excite more notice and more opposition. Still they feel that unless checked, the competition for business among the vast and increasing number of architects will lead to a constant adoption of those practices which obtain among some contractors and those who furnish building supplies, and who, by their persistent, and, may we not say, often impertinent pushing of themselves and their wares, have made it a necessity to turn a deaf ear, even to some to whom it would be both pleasant and profitable to listen.

The adoption at the last Convention of the resolution deprecating the practice of soliciting patronage, the adopting of a Code of Ethics by the Boston Chapter, the effort on the part of your Board to discourage the practice of architects entering into arrangements by which contractors feel themselves forced to advertise themselves in an elaborate manner, with illustrations of the architect's designs; the opposition to competitions, and, where they are deemed necessary, the attempt to regulate them so that they shall be fairly conducted and so that they shall be paid for by those who are alone benefited, if, indeed, they are benefited by them, all show an improved tone in the profession, but, on the other hand, they all testify to the prevalence of unprofessional methods, which would be condemned if they were practised by lawyers, physicians or clergymen.

There have been efforts made in three States, New York, Illinois and California, to have laws passed for licensing architects, and while there has been a general assent, if not open advocacy of the passage of such laws, they have not been unanimously supported by the best men in the profession, and there is a strong and growing sentiment that the Institute should endeavor to adopt a plan of examination somewhat after the manner of the Royal Institute of British Archi-

tects, in order that membership in the Institute should of itself be more conclusive evidence than it now is of worthiness to practise architecture.

The delay in issuing the Proceedings of the Twenty-eighth Convention was owing, first, to the unwillingness of the Board to begin to contract bills for printing until there was enough in the Treasury to pay the bills, and also to the enforced postponement of Institute work, because of the death of one to whom your Secretary owed those duties which cannot be put aside, and it has occurred to him that it would be well to print, after the manner of the Royal Institute of British Architects, six numbers during the year, which would contain not alone the Proceedings of the Annual Convention, but the doings of the Board of Directors, and that of the several Chapters, if they would furnish them to the Secretary.

There have been but three deaths of Fellows of the Institute, and as far as your Secretary is aware, of but one Honorary Member, the Hon. William Jones Hoppin, of Providence, R. I., who died at his residence in that city, on September 3. He was for many years Secretary of Legation to London, and was well known for his love of architecture and the other fine arts.

The death of James Renwick, on June 23, and of our beloved Ex-President, Richard Morris Hunt, on July 21, removed two of the leading men in the profession in New York. The former was more widely known away from his native city as the designer of Grace Church and St. Patrick's Cathedral; the other has long been identified with the Institute and was for many years an officer of the same, serving two years (the constitutional limit) as its President. The Board of Directors, of which he was a member at the time of his death, has passed proper resolutions to his memory, which will be engrossed upon its records; and arrangements have been made for a memorial meeting which will be held on Tuesday evening, and Mr. Henry Van Brunt, a Fellow of the Institute has been selected as the orator for the occasion.

Mr. H. G. Isaacs, one of the oldest practitioners in this city, died at Montreal, on August 8.

ANNUAL ADDRESS OF THE PRESIDENT OF THE AMERICAN INSTITUTE OF ARCHITECTS.

FELLOWS OF THE INSTITUTE IN CONVENTION ASSEMBLED:—

I congratulate you on assembling in this noble city. Hospitality seems to be especially at home here in St. Louis. Her hand is ever gracefully extended and is ever most pleasant to the grasp, when once she opens her door to a worthy guest, as she has done in your case to-day.

Our present membership is 454. Of those Fellows who have been forever removed from our earthly vision, Richard Morris Hunt ranks first. When the door of the future opened and let this giant stalk through we almost heard the shout of welcome from the mighty masters who had gone before him. They must have recognized at once his right to a place among them by his lofty bearing and the noble aspect of his countenance. May he breathe upon our souls that pure knowledge of law which he is now enjoying, that through us the men who follow us may be enlightened.

There has been no change during the year in the attitude of the United States Government towards the architects of the country. The provisions of the Tarsney Bill, by which all the buildings may be designed through a competition of architects, lie dormant. This is because the Secretary of the Treasury still holds that he cannot proceed under that bill until after a clause in an enactment of 1875 shall have been repealed, which clause, as you may remember, is to the effect that no Government Building shall be commenced until after the design for it shall have been previously made by the Supervising Architect of the Treasury. Last spring, Congress appropriated \$4,000,000 for a new Chicago Post-office Building, \$30,000 of which was for draughtsmanship and expert services. Under that act the Secretary of the Treasury is reported to have established a department in the Supervising Architect's office called the "Chicago Department." It is also said that the Secretary will employ a Chicago practitioner to make the design for the building I have mentioned, but it is understood that the architect must go to Washington as an assistant to the Supervising Architect, and that he must be paid for his services out of the \$30,000, such portion of that sum being used for his salary as may not be necessary for draughtsmanship and expert service. This would seem to require the architect to sacrifice his residence and his time for little else than glory. The precedent once established would probably be followed by the Government of the United States, and thereafter Government work would not be placed in the hands of an architect unless he were willing to neglect his private practice, and do it practically without compensation. If the National Government adopts this method, will not States, counties and cities follow? Even if it stops with the Government, I fear the result will be injurious to the architects and to the architecture of the country.

The practice of architecture has been rapidly improving during the past few years. This is true in the design and in the execution of work. It is due to increasing knowledge and the better training of the architects themselves. Not only are the schools and opportunities for study increasing, but a higher class of men are coming forward in the profession itself. Our own schools throughout the country are educating architectural assistants who have a better

training than was wont to be the case. Beside this, the foreign schools are doing much for our American youths. I am informed that until this year the French school has never issued its full diploma to an American, though many of our countrymen have been under its tutelage. It is, therefore, a fact worth mentioning, that two Americans, John Van Pelt and Herbert Hale, have taken the full diploma of the French School of Fine Arts. Surely, it cannot be claimed that originality and imagination will be dwarfed by a training in the knowledge of fundamental laws, the observance of which lies at the bottom of all good architecture. We ought to rejoice over the schools of architecture because the teachers in them are becoming more skilful, and because so many of our eager, talented American youths are at work in them. A most notable fact, involving great benefit to our profession, is the recent establishment in Rome of a school for the study of the Classics. It is intended for those who have already become proficient in the application of fundamental principles of architecture. It has only been in operation about one year, but has already accomplished valuable work. The promise of architecture for the twentieth century is hopeful.

The need of a home for the Institute is growing. At no distant day we should possess permanent fireproof quarters, where may be gathered our own records and those sent to us by learned societies of the world, also the portraits of our distinguished dead, and, what is of still greater value, the writings and drawings made by their hands. These can be gathered now, and the records of the Fellows who have passed away may be made quite complete. A fund to buy a lot and to place thereon a fireproof building, should be started at once, and I recommend that steps be taken to this end. Into such a National Building might be gathered many highly valuable documents and designs left by the distinguished Fellows of this Institute who have passed away during the past twenty years. A family without a home does not gain from the community the consideration which is its due; and the Institute will not possess its full and proper influence until its meetings shall be held under its own roof, where traditions of its noble dead shall surround its living members. Let us have an abiding place where the tablets that speak of the works of our brothers shall invite us to emulate their labors.

The policy of compelling members of the Institute to remain members of a Chapter has been tried long enough to give it a fair test. It seems to me that it has not proven satisfactory. Has not the time come to change it? It appears evident that the rule we have been trying to observe, namely, that Chapters may not overlap each other, is impracticable and should be abolished. I can see no good reason why two or more Chapters should not be formed in the same territory. It is quite possible that some of our Fellows will, in the future, desire to form themselves into a Chapter for the purpose of furthering Fine Art alone, and there may be others who will have quite different ends in view. Should not each be allowed to organize a Chapter? Will not the Institute be benefited thereby?

I thank you for your attention.

BOOKS AND PAPERS.

To the numerous works already extant on art, Professor Van Dyke has added a "*History of Painting*"¹ which, while not claiming to be more than a text-book for colleges, and, therefore, necessarily abbreviated, may be set down as one of the most valuable yet produced. It is comprehensive, well arranged and up to date, including living painters and American artists. Moreover, it is correct in its facts and sound in its judgments, with but few exceptions, and it is well illustrated.

The pictures, indeed, deserve special mention for their excellent quality and the good judgment shown in their choosing. We must, however, except the "Helen of Troy," given to represent Sir Frederic Leighton, as it is far from being one of his best works. Nor is the tawdry "Wise and Foolish Virgins," which we are sorry to hear has been presented to the Yale Fine-Arts Gallery, a fair specimen of Piloty's powers. His "Dead Wallenstein," or the "Thusnelda," would have been much better.

Other good features are the lists of "Books Recommended," and of the principal works of the chief painters, with their whereabouts, and a full index.

We notice a few errors and omissions, as in the absence of Decamps and Gabriel Max, and of the date of the death of Albert Moore (deceased 1893). Callcott is spelled "Calcott"; Blommers is spelled "Bloomers," and Lhermitte is printed "L'Hermitte." An important addition to the lists of authorities given would be Bellier de la Chavignerie and Auvray's monumental "*Dictionnaire Général des Artistes de L'école Française*," with which the author is probably acquainted.

Barring these slight blemishes, it is very seldom that we find so much value in a reference-book of less than three hundred pages.

¹ "*A Text-book of the History of Painting*," by John C. Van Dyke. Longmans, Green & Co., New York and London. Price, \$1.50.

If it were true, as Hogarth says, that genius is nothing but labor and diligence, then the compiler of a work, like the one under review, must possess a liberal portion of the divine gift. Few people, probably, realize the patient industry required in making a reference-book, but on this subject we can speak with the knowledge born of some experience, and easily recall occasions when many hours of steady work have been expended in the search for a reliable date or the proper spelling of a name.

In "*Schools and Masters of Sculpture*,"² Miss Radcliffe has endeavored to give a complete, though perforce condensed, history of the art and its practisers and has reached a high degree of success.

Beginning with Egypt, the cradle of all art, the author leads us through Assyria, China, Japan, India, Persia, Phoenicia and Cyprus to Greece, to whose wondrous plastic treasures full justice is done. Then comes Roman and early Christian sculpture and a chapter devoted to mediæval work brings us to the Italian masters of the Renaissance. From them, we turn to the consideration of French, German and English sculpture, and next to the productions of European and American sculptors in general in our own day. The concluding portions of the work deal with the study of sculpture in the rich museums of the Old World and in our own much scantier but growing collections.

The book is made more useful by the addition of a bibliography of sculpture, and a copious index, and is well printed from clear type and embellished with a number of good reproductions of famous sculptures. Among these it is strange not to find the "Venus of Milo," an omission in favor of lesser works which most readers, we think, will scarcely approve, and we miss also an illustration of one of the superb Greek bronzes, such as the headless youth from the Sabouroff collection, now in Berlin, or something from the matchless collection at Naples. Surely their absence is not atoned for by the representations of the youthful Nero and the Meleager of the Vatican.

Reverting to the text, we deprecate the scant praise given to such a master as Fremiet, and note a few inaccuracies, as where the author speaks of Dalou's marble relief of the "Meeting of the States-General," which is of bronze, but gladly leave the ungracious task of pointing out such slight imperfections in so excellent a work as this.

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 SMOKING-ROOM: THE BALTIMORE CLUB-HOUSE, BALTIMORE, MD. MESSRS. J. A. & W. T. WILSON, ARCHITECTS, BALTIMORE, MD.

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

PLANS OF THE SAME BUILDING.

COMPETITIVE DESIGN FOR THE MINNESOTA STATE-HOUSE, SUBMITTED IN THE FIRST COMPETITION BY MR. J. A. SCHWEINFURTH, ARCHITECT, BOSTON, MASS.

THIS design was awarded second place by the experts. The Capitol Commission, however, would not accept this part of the report, but denied it a place amongst the five designs to which the prizes were finally awarded.

SKETCH FOR DINING-ROOM MANTEL IN HOUSE OF JOHN E. DEVLIN, ESQ., BOSTON, MASS. MESSRS. WHEELWRIGHT & HAVEN, ARCHITECTS, BOSTON, MASS.

PANDOLFINI PALACE, FLORENCE, ITALY. DRAWN BY MR. W. H. ORCHARD.

This building, designed by Raphael for his friend Giannozzo Pandolfini, Bishop of Troja, was not completed, owing to various interruptions, until 1620, a hundred years after the great artist's death. Its construction was at first superintended by Gian Francesco da San Gallo and afterwards by Aristotele da San Gallo.

[Additional Illustrations in the International Edition.]

BALTIMORE CLUB-HOUSE, BALTIMORE, MD. MESSRS. J. A. & W. T. WILSON, ARCHITECTS, BALTIMORE, MD.

[Gelatine Print.]

THE Baltimore Club-house occupies a lot 34 feet wide, with a space about 6 feet wide on the north for light. The lot has a grade,

² "*Schools and Masters of Sculpture*," by A. G. Radcliffe. D. Appleton & Co., New York. Price, \$3.00.

which carries the ground about 5 feet higher at the rear of the building than at the front. The exterior is of specially made red brick 16 inches long, with moulded brick around the double and triple windows, and moulded brick mullions. The dormer is of copper; roofs of dark-brown glazed tiles. The first story and basement, with sills and lintels of upper windows, are of Manassas red sandstone. The doors are of oak, with massive hinges, grilles and lock-plates of hammered iron. The interior is mostly finished in cherry and in quartered-oak. The cost of the building, without furnishing, was about \$25,000.

TWO CHIMNEYPieces IN THE (SO-CALLED) HOTEL SULLY, CHATELLEAU, FRANCE. RESTORED BY M. DEVERIN, ARCHITECT.

[Copper-plate Photogravure.]

CANADIAN CONFERENCE ROOM IN THE IMPERIAL INSTITUTE, LONDON, ENG. MR. T. E. COLLCUTT, ARCHITECT.

AUSTRALIAN CONFERENCE ROOM IN THE SAME.

GENERAL SCHEME FOR THE UNIVERSAL EXHIBITION OF 1900, PARIS, FRANCE: BIRD'S-EYE VIEW.

PLAN OF THE SAME.

SEE Paris letter in this issue.



BOSTON, MASS.—*Summer 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.

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

CINCINNATI, O.—*Fifth Annual Exhibition of the Cincinnati Art Club: at Closson's Gallery, October 21 to November 2.*

NEW YORK, N. Y.—*Twenty-eighth Semi-annual Exhibition: at the Metropolitan Museum of Art.*

Turner's "St. Mark's Place, Venice," also, Paintings by other English Artists: at the Avery Galleries, 368 Fifth Ave.

Portraits of Bismarck by Walter Petersen: at Knoedler's Galleries.

ST. LOUIS, MO.—*Art Exhibition at the Exposition, including Special Collection of "Pictures of the Glasgow School."*

Inter-Club Exhibition of the St. Louis Architectural Club: at the Museum of Fine Arts, opened October 15.



THE SIMPLON TUNNEL.—The tunneling of the Simplon will be commenced early next year. The first plans for this undertaking date from 1890, from the chief-engineer of the Jura-Simplon Railway Company, Mr. Durnow; they were, however, materially altered a couple of years afterwards, by a Hamburg engineering firm, and the final plan is the outcome of cooperation between several experts. There will be two parallel tunnels, each about 66,000 feet long, the distance between the two tunnels being 57 feet, and at every 670 feet the two tunnels will be connected with each other. The one tunnel will be completed first, whilst the other will serve for ventilation, and will probably not be completed till the traffic makes it necessary. The arrangement of the two tunnels has, to a great extent, been adopted so as to be able to bring about efficient ventilation and reduce the temperature. According to calculations, the temperature at the point farthest distant from the surface will be some 102° to 104° Fahr. During the construction of the St. Gothard tunnel the temperature, on account of deficient ventilation, at times reached 99° Fahr. The ventilation was effected by means of compressed air, which was conveyed into the tunnel through metal pipes, and which was used for driving the various boring machines prior to serving for ventilating purposes. The dimensions of these pipes were of necessity small, and only about 70 cubic feet of air could be conveyed into the St. Gothard Tunnel every second. By means of the second tunnel, which, as mentioned, in the meantime will only be used for ventilation, some 1,800 cubic feet of fresh air can every second be conveyed into the Simplon Tunnel, whereby the temperature can be brought down to 77° Fahr.—a great boon for the workmen and, later on, the passengers. The auxiliary tunnel may also prove useful for the transport of material, etc., for the principal tunnel. It is expected that the Simplon Tunnel can be completed in the course of five years and a half, or in three years' less time than the St. Gothard Tunnel, although the latter is some 15,000 feet shorter than the

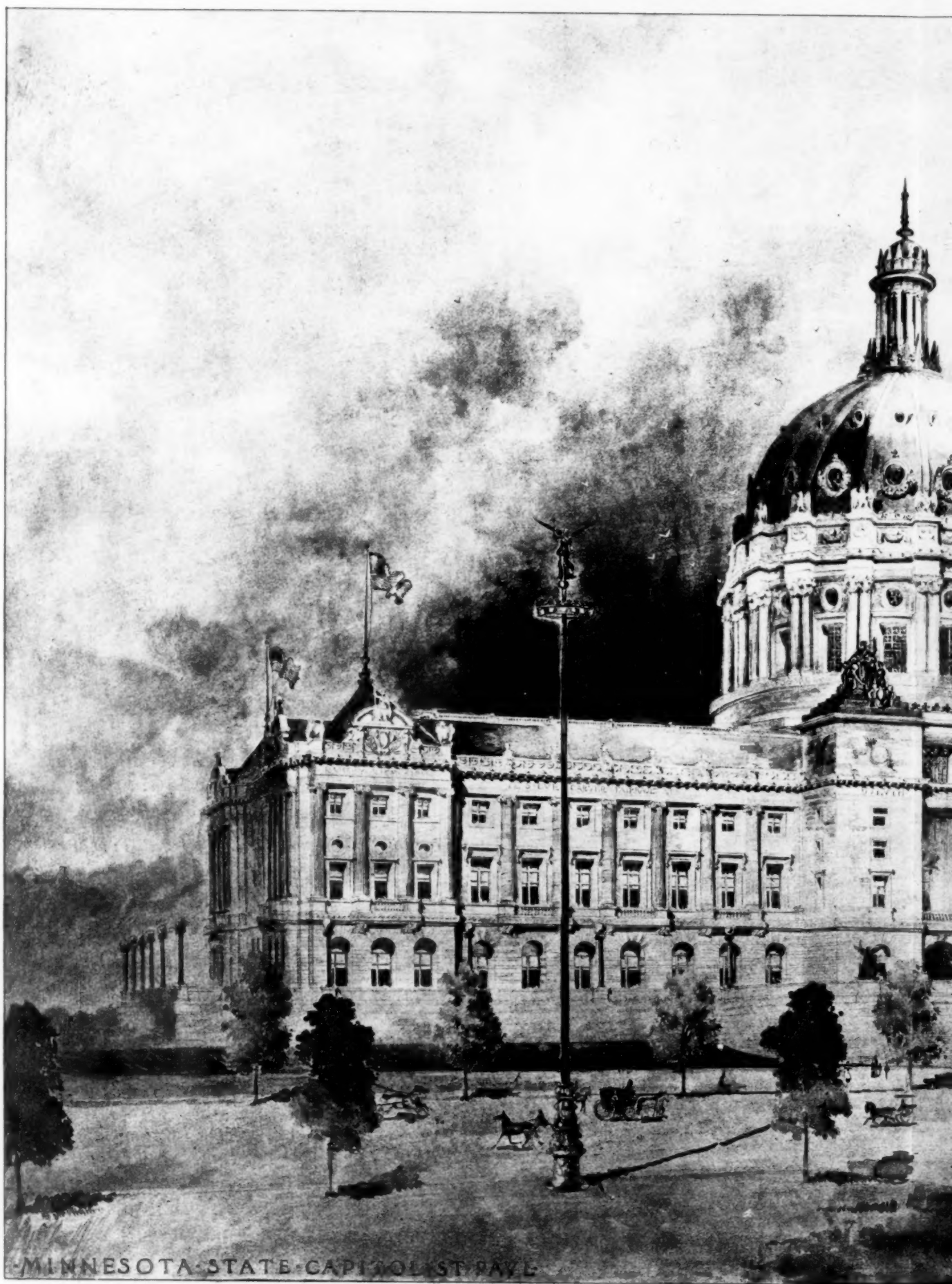
former, the Mont Cenis Tunnel being again some 6,000 feet shorter than the St. Gothard. The fact that the Simplon Tunnel will be at a level about 1,500 feet lower than the two others, is also a point in its favor, and although the first cost will be heavy, the working expenses are expected to be considerably less. The cost is calculated at 54½ million francs, or about 2,180,000l. — *Engineering.*

THE BUILDING OF SAINT SOPHIA.—Materials were brought from far and near, Egypt and Greece uniting with Asia Minor and the islands, each contiguous to the capital, in supplying their quota of marble for the columns and walls. For nearly six years the works went on with unabated energy; many difficulties were overcome, and many experiments were tried and found successful, and at length, on the 26th of December, 537, the church was dedicated amid the acclamations of the populace, and the Emperor exclaimed in the fulness of his pride: "Glory be to God, Who hath thought me worthy to accomplish so great a work. I have vanquished thee, O Solomon!" The Emperor's joy in his church was, however, destined to receive a rude shock some twenty years later, when the apex and part of the dome were thrown down by an earthquake; but the same energy which was shown in the building of the church again asserted itself. The damage was repaired—the dome being heightened twenty feet to give it additional security—and the church was reconsecrated on the 24th of December, 563, five and a half years after the disaster. The Church of Saint Sophia has never been surpassed in the unity and completeness of its design, and in the daring nature of its construction. In this building the arch and dome assert themselves and dominate everything, and we have a lightness, a spaciousness and a grandeur that had never been reached in the finest of the basilicas, and has never been surpassed since. During all the centuries which have elapsed since its erection, it has maintained its supremacy as the masterpiece of Byzantine architecture and construction, and it fixed generally the type on which most of the later churches in the East were based, but it has never been surpassed by any of them. — *Scottish Review.*

PAPER PULP FOR LEAKS.—Paper pulp is one of the most useful articles in the reach of mankind. Mixed with glue and plaster-of-Paris or Portland cement, it is the best thing to stop cracks and breaks in wood. Pulp paper and plaster alone should be kept within the reach of every housekeeper. The pulp must be kept in a close-stoppered bottle, in order that the moisture may not evaporate. When required for use, make it of the consistency of thin gruel with hot water, add plaster-of-Paris to make it slightly pasty, and use it at once. For leakage around pipes, to stop the overflow of water in stationary washstands, where the bowl and the upper slab join, it is invaluable. Used with care, it will stop leaks in iron pipes, provided the water can be shut off long enough to allow it to set. Around the empty pipe wrap a single thickness or two of cheese-cloth just wide enough to cover the break, then apply the compound, pressing it in place and making an oval of it somewhat after the fashion of lead-pipe joining, only larger. The strength of this paste, when once it is thoroughly hardened, is almost beyond belief. The bit of cheese-cloth prevents the clogging of the pipe by the paste working through the cracks. An iron pipe that supplies the household with water had a piece broken out by freezing. The piece was put in place, bound by a strap of muslin, then thoroughly packed with paper pulp and Portland cement, and was to all appearances as good as new. Paper pulp and fine sawdust boiled together for hours, and mixed with glue dissolved in linseed oil, makes a perfect filling for cracks in floors. It may be put on and left until partly dry, then covered with paraffine and smoothed with a hot iron. — *Rural Mechanic.*

THE WALLS OF AVIGNON.—There is no city in Europe which gains so much character from its fortified wall as Avignon. In the eyes of a military engineer the old masonry, if compared with the defences of such a place as Lille, appears as worthless as a cardboard enclosure. But when Avignon was a refuge for the popes there was no other place that was more secure. It now suggests to the tourist the strength of the enemies who pursued popes and anti-popes for more than a century. The walls are wonderfully preserved. They have now to withstand enemies of a novel kind, for the municipal council have come to the conclusion that they are obstacles to public improvement. At first it was proposed to deal only with one of the watch-towers of Clement VI. The Commission of Historic Monuments interfered, whereupon the councillors decided upon a wholesale destruction of the ancient fortifications. It cannot be denied that Avignon is no stronger from its fourteenth-century walls; but if the municipal councillors are permitted to have their own way the city will be infinitely less attractive, for it obtains its peculiar character from the vast and grim palace of the popes and the walls, of which the picturesqueness has been enhanced by years. — *The Architect.*

MOLYBDENUM, AN INTERESTING METAL.—In Paris, M. Moissan has recently succeeded in preparing fairly large masses of pure molybdenum. The metal thus obtained has a specific-gravity of 9, and is only fused with difficulty. The pure metal is quite as soft and as malleable as wrought-iron, and can be easily forged at a red heat. It can be preserved without oxidation under water for several days. The most remarkable property of the metal is, however, the fact that it can be cemented like wrought-iron, forming a "steel," if the term may be used, which can be tempered similarly to ordinary steel. Moreover, cast molybdenum containing several per cent of carbon can be softened by placing it in a mass of oxide of the metal, just as in the ordinary process of making malleable castings. Having a very great affinity for oxygen, M. Moissan suggests that it may be usefully added to the iron in a converter, replacing manganese or aluminium. As the oxide of the metal is volatile, it does not remain in the converter. — *Engineering and Mining Journal.*



DESIGN FOR MINNESOTA STATE-HOUSE, SUBM

J. A. SCHWEINFURTH,



ALLIANCE PRINTING CO. BOSTON

HOUSE, SUBMITTED IN THE FIRST COMPETITION.

SCHWEINFURTH, Architect.



PANDOLFINI PALACE, FLORENCE, ITALY.

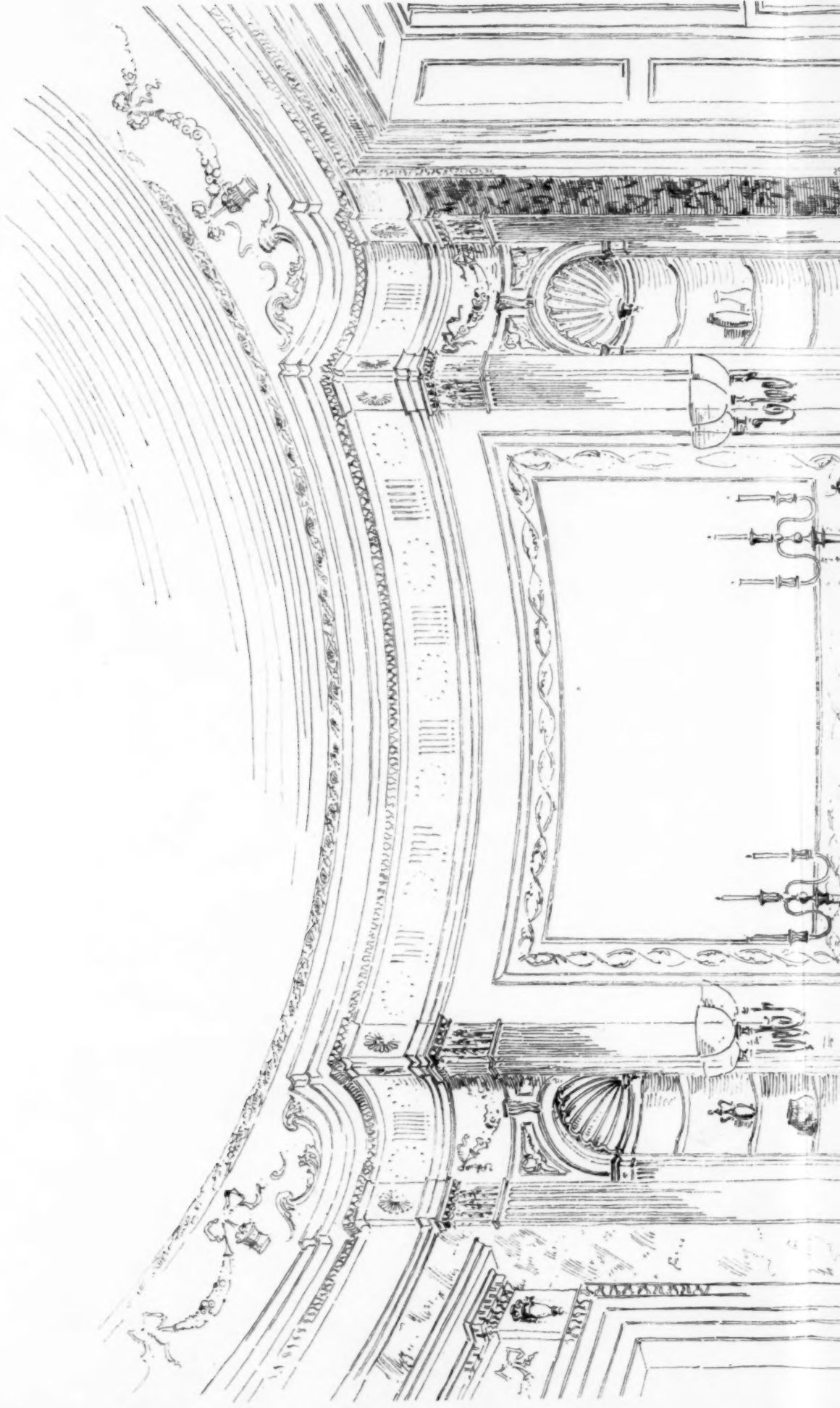
Drawn by W. H. ORCHARD.

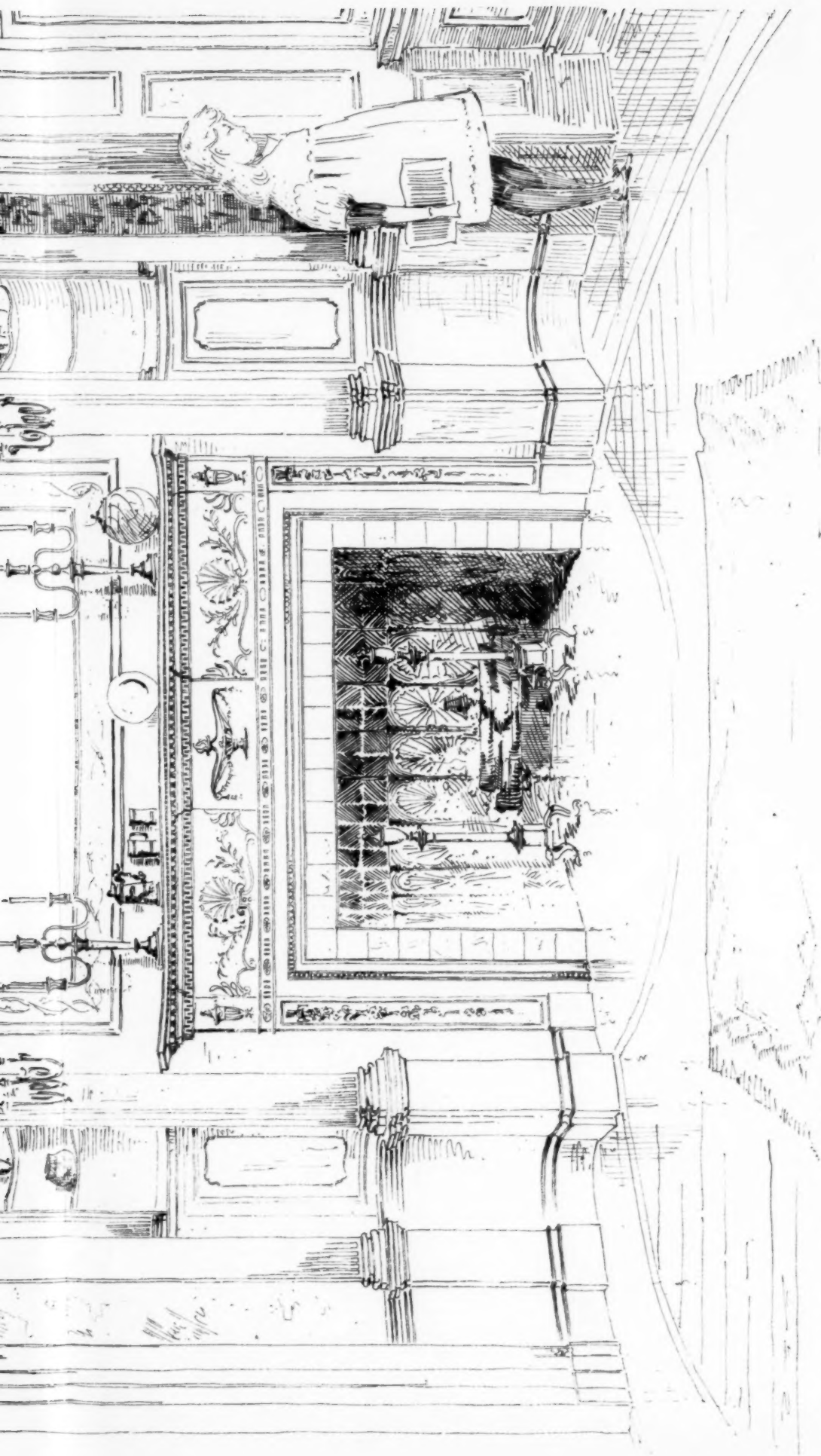
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SKETCH OF DINING ROOM MANTEL
HOUSE FOR JOHN E. DEVLIN ESQ.
WHEELWRIGHT & HAVEN ARCHT'S BOSTON MASS

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