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THE *Evening Post*, commenting upon the case of Mr. Tolman, which we discussed a fortnight ago, says, with apparent disapproval, "Architects in this country hold that their plans, specifications, and details belong to themselves," etc. Our architects, however, in this do only what architects do everywhere else, and what in the experience of the world it has been found to be reasonable, and for the general convenience as well, that they should do. This is a doctrine which, to be sure, is commonly received at first as a paradox, but which may be trusted to enforce itself whenever it has been considered with due care. Accordingly, continues the *Evening Post*, if an architect designs a man's house, and uses his client's ideas therein, he is ready at once to sell the same design again to somebody else; and so "no layman is free from the liability of having a neighbor erect a dwelling-house precisely like his own." The point is, however, that the architect does not sell his design to the first client, or to any other; he only sells his professional services as a lawyer does, keeping his plans and other professional memoranda, as the lawyer does his notes of titles and his briefs, and using for each client such a design as he finds best suited to the client's wants. If he is an architect who takes pride in his work, he dislikes nothing more than to build one house precisely like another, it being his cardinal doctrine that each case demands an individual treatment, and he recalls his plans and details not that he may use them over again, but chiefly to spare himself and his client the common annoyance of seeing his design copied exactly by some unauthorized carpenter for the benefit of a person who pays nothing for the use of it. There are architects, it is true, not of a very estimable kind, who save themselves trouble, and earn their fees easily, by using the same design over and over again, and building one house just like another, as speculative builders do. This class of architects is easily avoided, if the client wishes; but as a matter of fact we believe it is a very popular class. As for the ownership of the ideas which may be pirated, it may be said that the architect usually gets little that is available from his client except information of the client's needs, the practical means of supplying them being the architect's stock in trade. The number of merchantable ideas which he receives is commonly very small compared with what he furnishes himself.

THE truth is that, though an architectural copyright would be for the immediate, if not the ultimate, advantage of architects themselves, it would probably be far from palatable to the public. Of all the ideas that clients bring their architects, the most conspicuous and the commonest is the notion that they must have a house like somebody's else. Almost every architect will recall, with a weary shudder, the typical clients who, after engaging him to design their houses, have dragged him from his drawing board to inspect the houses which they wished their own to resemble. We have never argued in favor of architectural copyright, believing that it would be too difficult of enforcement for practical use, or, if it could be rigidly applied, a check upon the development of an art that grows as architecture does by a common development and assimilation of current ideas; and holding that the best equivalent protection was

in reserving to architects the control of their own drawings and in the growth of an intelligent feeling against absolute copyism. But if copyright is to be recognized, there is no doubt that it is vested first in the person who produces the work that may be copied. Neither copyright nor plans cease to become the property of the producer, except by virtue of a formal transfer, or an incontrovertible usage which implies a transfer. Such a usage does not exist in architectural practice, and such a transfer is not common. As far as security against copying goes, there is no one who has greater interest in checking it than the architect himself, who is more injured by it than anybody else; and there is no one, on the other hand, to whom the plans are less essential for copying a design than to him who has made it. In short, if clients wish to enjoy their own houses without seeing them copied, we advise them—after the obvious precaution of discouraging the copyism of other people's—to look out for an architect who puts his professional achievement first, and money-making second (of whom, fortunately, there are many); and then to cast their influence in favor of their architect's protection as well as their own, by the usage of keeping plans and drawings where they are safest,—in the hands of the architect himself.

ONE or two things occur to us as worth adding in answer to E. A.'s communication on factory construction in our last number, with regard to the employment of architects in such work. We leave it to C. to continue, if he will, the argument against the one-story plans, to which he committed the profession rather hastily, we think, and concerning which E. A.'s retort is effective rather as a rejoinder to C. than as an argument against architects. That men who have studied and practised the building of mills know more about it than those who have not, is a proposition that few persons will care to dispute. That architects commonly have not is probably true. But to assume that they could not or would not, if opportunity were afforded them, is unnecessary. E. A. says in substance, that it is not to be expected that men should be asked to do the work who are to learn to do it by doing it. Yet we venture to say that this is exactly the way in which the men who have done it learned to do it, so far as they had to learn anything different from what architects may be expected to know. Everybody in fact, in every business, except the mere student, learns how to do a new kind of work by special study when he has occasion to do it, as a lawyer studies a new class of cases, or a physician an unusual disease; and architects may be trusted as able to do this, at least if the way has been shown them. The only other question is whether architects are unwilling to learn,—are intractable, for instance, and too full of their own notions to take heed of their clients' wants, or too lazy to do their work faithfully. We doubt if E. A. or another client would find them so unless he made a very injudicious choice among them. There are many mill-owners waiting, E. A. tells us, for the architects who will relieve their factories of their dreariness. It is safe to say that there are many architects waiting who are ready to devote a good capacity and a fair amount of labor to the work when it is offered to them,—only if the best are wanted they will naturally wait to be asked. It is hardly to be expected that an architect who is in active practice will devote himself to studying a special branch of construction till he sees occasion to use the knowledge of it; but we are encouraged by E. A.'s statement to hope that for the capable young practitioner who will perfect himself in this particular branch there may be an opportunity in store. If any such will send us designs which are the result of special study we shall be very glad to receive them for E. A.'s sake and our own.

THE assertion that the open-timbered roofs and solid work which the architect has introduced into churches were anticipated by the mill builder "requires proof," but, if sustained, does not, so far as we see, affect the argument; for the precedents which architects have borne in mind are older by centuries than cotton factories, and the means have been in use from the oldest days. To extend the principle to buildings divided into apartments for studios or domestic uses is likely to be a slow task, there being but few clients who are underwriters or mill owners. An account of the experience of the owner who built his house in the manner of a mill would be of great interest to us and to our readers. Two or three questions suggest themselves: How was the system carried out? How expensive did it prove?

Were the qualities which the owner required in a house such as would content most clients? Hollow spaces, as we have remarked, are commonly desired for their non-conducting qualities, and it has been found necessary to introduce them into outer walls, and sometimes inner walls, of masonry. Of course cheapness, including economy of time in building, is at the bottom of the trouble; for with cost the thing can be cured, and C. has put it clearly that when the risk is lifted off by insurance, the ordinary client finds it cheaper to let his house or his hotel burn than to build it substantially. It is our impression, in fact, as we have argued before, that the insurance companies, while they have benefited individuals, by saving them from intolerable losses, and so have given a valuable steadiness to the community, have retarded the progress of good building by relieving those who are responsible for bad building from the consequences of it, while their care to protect themselves, except in extreme cases, has gone in comparison but a little way.

THE New York Board of Health apparently means to take advantage of the powers conferred upon it by the Tenement-House Act passed by the last legislature. The act clothes the Board with very full powers, and assigns it at the outset a fund of ten thousand dollars with which to enforce its authority, which fund is to be maintained by the fines imposed upon offenders under the law. The plans of all tenement-houses built or converted are subject to the approval of the Board, and the act provides a number of wholesome restrictions to which all such plans must conform. No tenement-house is to be built on a lot on which there is another building at a less distance than ten feet, and this distance must be increased by five feet for every story in height above the first; nor can any such house be put nearer than ten feet from the rear line of its lot. No continuous building built or converted for a tenement-house is to occupy more than sixty-five per cent of its lot, unless it is a corner lot. But in all these cases a discretionary power is given the Board of Health to relax the restrictions. It is also ordered that in new tenement-houses the rooms shall not be less than eight feet high, and no sleeping-room shall be without an outer window of at least twelve square feet of surface. In all rooms the outer windows must have a total area one tenth of that of the floor, and one, at least, of them must come within six inches of the ceiling. Where a room has no outer window it must have "over the door a ventilator of perfect construction," connecting it with one which is open to the air, "and so arranged as to produce a cross current of air." The Board has power to check the overcrowding of tenements or rooms, and to require a janitor in any house which contains more than ten families, and the right to sue for violation of the act, a penalty of ten dollars per day being provided for violation, which goes to the increase of the fund above mentioned. There are some passages of the act which might, we should think, lead to doubtful interpretation — as to what is a ventilator of perfect construction, for instance, and what produces a cross current of air — and there is perhaps a question whether, if a weak-kneed or a political board of health came upon the stage, their discretionary power would not turn out a delusion and a snare; but if the act is wisely enforced, although it is far from providing a reform for all the evils of a tenement-house construction, it will go a good way in improving the present condition of things.

A CURIOUS counterpart to the expected ruin of the Eddy-stone Lighthouse from the fall of the rock on which it is built is to be looked for, or at least feared, if we are to trust reports that come from Madrid, in the destruction of the Alhambra by the falling of the hill on which it has stood for six centuries. It is said that parts of the hill have already fallen, and there are indications of danger of a land-slide great enough to carry away the Alhambra itself, and the Alcazaba, or citadel, which adjoins it. There are not many buildings of a past age whose destruction would be counted so great a loss by the cultivated part of the world; perhaps none at all which would seem to the countrymen of Irving to leave such a void in the world. Probably, too, there is none whose architectural renown borrows so much from its picturesqueness and its romantic associations. Painters and lovers of the romance of history could better spare almost any other building. Its unique character, its picture-making qualities, the beauty of its decorative work, its superb site, and even its traditions, have lent a vicarious charm to its architecture in the popular reports. As a work of pure

architecture, or as an example for study either for itself alone or for its place in the history of building, its loss, though a serious one, would be less to be deplored than that of many a less famous structure. The hope is expressed that it may be possible, by timely aid from engineers, to so buttress the hill on which it stands as to preserve it from falling, and with it the building.

THE last election of the English Royal Academy seems to be looked upon as a concession to the popular judgment. Mr. Alma-Tadema, who was made associate three years ago, has been chosen fellow, and Messrs. Boughton and Herkomer are made associates. The advancement of Mr. Alma-Tadema, says the well-informed London correspondent of the *New York Tribune*, was, in a measure, forced upon the Academy by public opinion, there being among the conservative academicians a disposition to keep him longer on probation. This reluctance yielded, however, to the voice of popular favor and the prices commanded by the artist's pictures, even although according to the tradition of the Academy the vacant fellowship should this time have been given to a sculptor. The compliment is the more marked in that Mr. Alma-Tadema is not an Englishman (having been born in Friesland in 1836), while his manner of painting, being more French than English, does not appeal to the sympathies of the older academicians. It is unreasonable to complain of backwardness this time, for three years is but a short time for an artist to remain an associate. The tardiness was in the first election, for the artist had been twice medalled in Paris, and made Chevalier of the Legion of Honor, before he was chosen associate. He has been sneered at as a mere archaeologist, for his fondness for painting scenes from classical life and his fidelity to historical detail; but his pictures, painted with rare manipulative skill, a power of color, a feeling for tone, and, above all, a sense of what makes a picture, which are very un-English, have made their way with the public, have been often engraved, and bring very large prices. His work is highly valued in the United States, being known, not only to Americans who have visited England, but at home through engravings as well as by a number of pictures which have been exhibited here.

THE two new associates are also, to all intents, foreigners. Mr. Boughton, though of English birth, spent his boyhood and early manhood in this country, began his schooling in art here and finished it in Paris, only returning to England in 1861, when twenty-seven years old; so that Americans are inclined, with perhaps a rather forced patriotism, to claim him as an American painter, while his artistic affiliation is more French than anything else. Mr. Boughton is also well known and esteemed in this country, being a Fellow of the National Academy, to whose exhibitions he has often contributed, and having sold many pictures here. Mr. Herkomer, less known in the United States, is a Bavarian, whose training is mostly of the Munich school. His first great success was a picture of the Chelsea Pensioners, exhibited at the Academy in 1875, of which it is said that when it was brought up for judgment, the committee, "weary as they were with a long day spent in judging mediocrities, could not refrain from clapping their hands in genuine admiration." Since then Mr. Herkomer has steadily gained in reputation. Last year he won the grand medal of honor at the Paris Exposition, and he now joins the Academy at the early age of thirty. He is known as an etcher as well as a painter.

NOTES ON CONTRACTS.¹ II.

THE ordinary contracts make no provision against the risk of loss to the owner through the bankruptcy of the builder, by which he is obliged to have his work completed by other parties, usually at an increased expense; but careful architects sometimes insert a clause to the effect that in case of the insolvency of the party of the second part the owner shall have the right to take possession of the work and materials, similar to the common clause providing a similar remedy for the neglect of the builder. With this clause, and a liberal reservation in the payments until the completion of the contract, the owner is at least in a better position than if he had to depend upon the assignee to finish his building, but he may suffer annoyance from attachments upon materials delivered at the works. Sir Edmund Beckett adds to his form of contract a little sentence, thus: "and all materials shall become the property of the party of the first part as soon as they are delivered on the ground," this being for the pur-

¹ A Paper read before the Boston Chapter of the American Institute of Architects, by Mr. T. M. Clark, Fellow, Boston.

pose of preventing the parties furnishing the materials from attaching and removing them, if the builder should fail without having paid for them, leaving the owner, who very likely had advanced money on them, to suffer the loss. It seems hard on the lumber dealer, if by an agreement between the owner and contractor, in which he was not even consulted, he could be deprived of his right to recover his property wherever he could find it, unless he were paid for it, and I was disposed to question the wisdom even of the Queen's counsel, in inserting such a manifestly unjust stipulation, but having occasion to draw up a contract in which it was very necessary to use the utmost precaution, I wrote a similar clause and paid a lawyer for his opinion of its validity, and was surprised to have his answer that the contract in that form would, he thought, be valid against even the party who furnished the materials, or the "material man" as the law calls him, and that thus, without his consent, we could prevent his claiming any satisfaction from the owner after his goods were once delivered at the building, no matter whether they were simply piled up alongside, and if the builder went into bankruptcy, he could only collect his dividend from the assignee.

This stipulation, then, may be of use in some cases; in common practice, however, it has seemed to me that it might be made to commit the owner to accept inferior material if once delivered, and that it was as well to omit it.

It must not be supposed that the lumber dealer is entirely without protection. By the statute, he has a lien on the building itself for the value of his materials, provided he gives notice of his intention to claim such a lien when the materials are delivered, and by giving such notice he can collect the value of his goods from the owner in the same manner as the workmen under mechanics' liens; and it is only when such notice is not given that he can be deprived of his remedy against the owner, as just described.

A little corollary may be drawn from this, that instead of the common clause in printed contracts, that "security against mechanics' liens must be given prior to payment by the party of the first part," the condition should be enlarged to include "mechanics' liens and other claims chargeable to the party of the second part."

It is not every one who knows all that is to be known about mechanics' liens. They are popularly regarded as things to be dreaded, but not provided against, and we are all liable to be entertained by our clients with stories of their friends who through their confidence in their architect had to pay twice over for their house, once to the contractor and again to the workmen through liens. The statute reads that the right to enter a lien for work done extends for thirty days after the work, for which the lien is claimed, is finished, and sharp contractors have been known to keep a man about a building for weeks to extend the time within which their workmen might, by their collusion, record liens against it, and any suspicious proceedings of the kind should be watched and notes made of them, and the record book frequently examined. By the law, the owner can prevent any workman, employed by a contractor, from claiming a lien on his building, simply by serving notice on him when he begins to work that he will not admit such a lien from him. The man may then work or not, but if he chooses to work he can only look to the contractor for his pay. In practice, however, it would not be easy to recognize every new workman when he began his labors, and a subsequent notice would not destroy his claim for a lien for work done previous to the notice.

Perhaps it would be well if architects were more careful to guard the interests of their clients in this respect. Scores of liens are recorded every week in the large cities, and often for large amounts. It is obvious that a good percentage of the amounts due should always be reserved till the final payment, and that this should not be made due till at least thirty-one days after the completion of the work. The "security against a mechanic's lien" of which the contracts speak is so rarely exacted, that I doubt if many architects know in what form such security should be.

Having had occasion to inquire about the subject from a lawyer, I was told that the best form would be a bond with sureties, in a sufficient sum, the condition being, that if no lien were recorded within the time allowed the bond should be void. On inquiry at the Street Commissioner's Office, in Boston, I learned that they required such a bond, but they said that they had a special one drawn up by the city solicitor for each case.

In practice, the simplest way is to keep watch of the record, usually the book of mortgages on real estate, unless a special book for liens is provided, and if no record is found within the allotted time, the building is then free. Sometimes the clerk will give a memorandum with date and signature, to the effect that no liens exist at the given time.

It is often very annoying to go long distances to the town or place where the records of a thinly inhabited district are kept, and then the bond with sureties might be exacted, though most builders would dislike furnishing such documents.

It is well to mention that, by the statute, the laborers who dig ditches or grade the land have also their mechanics' lien upon the land itself, precisely similar to that of the carpenters on the building, and sometimes these men have the strongest propensity for protecting themselves in such a manner.

Once had the misfortune to offend deeply a contractor, whose credit on the mercantile agency books was not very good, so that I proposed to give him a contract on condition that he would find two

sureties for its fulfilment. All public contracts are accompanied by such sureties, and if private ones were not sometimes so secured, it seemed not unreasonable that they should be, but he resented the proposition as an unbearable reflection on his character. Perhaps some architects may have had experience which would help in making such a custom more general, and building contracts consequently more secure than they now are, and thereby not only free architects from many of their worst anxieties, but assist owners by increased security, and builders by relieving them of the competition of dishonest and irresponsible contractors.

An interesting point was raised not long ago in the newspapers. A man wanted some painting done on his store front, and to get it as cheap as possible he asked two or three painters to estimate, and accepted one of the estimates. The painter went to work, and while engaged on the building dropped a sign-board or something of the kind and injured a person passing below. The friends of the injured party brought suit against the proprietor of the store for damages, but it turned out that the painter's estimate, and the owner's acceptance of it, formed a valid contract, and that in such a case, the contractor, and not the owner, was liable. If he had employed the painter by the day, the owner would have been principal, and the painter his servant, and it would have been the owner who would have had to pay. This principle is clearly laid down in several reported cases, and is of considerable importance.

It would be interesting to know if an insurance clause was ever inserted in a contract which fully protected all the parties. It is by no means enough for the owner to insure the full value of the building. Suppose the house burns before any payments are made to the contractor: of course the insurance company will not pay anything to the owner, for he has suffered no loss.

The builder may or may not have insured his interest: if he has, all is well, but if not, the loss may very possibly bankrupt him, and the owner thus indirectly suffers by being compelled to make a new contract, or have the assignee do what he can, which is probably not much. It is the desire of providing against the ruin of the builder which leads to the usual provision for insuring jointly, and in case of loss the companies put much difficulty in the way of settlement.

Of course the interest of the two parties in the loss varies constantly. Until a payment is made, the builder's interest goes on increasing up to the amount of the payment. When this is made the interest to that amount is transferred to the owner. No insurance company will undertake to partition the amount of the loss according to the proportionate interest of the parties; they will take premiums from any one, but will only pay the loss to one party. Then, if the builder gets the whole amount, the owner must trust to his honesty to hand him over his portion, and vice versa, which is quite at variance with the proper use of contracts, which are intended to supersede the necessity of confiding in the moral sense of the parties, to say nothing of the possibility of honest differences of opinion. Consequently, careful builders sometimes object to such a clause. In one case the builder could only be satisfied by having the policy written payable to the architects, who were constituted the judges between the parties.

Perhaps the best way would be to specify that the builder should keep his interest insured, and deposit the policy with the architect, who could then make sure of the contractor's interest being protected, and the owner could be trusted to insure his own, and if the builder neglected to take out a policy, the architect would probably have authority to get one in his favor and deduct the premium from his payments.

Even then, however, the builder might claim that his interest required that the owner should keep his part of the risk well covered, and a separate clause might be added to that effect.

Something might well be done to settle this point. It is very common to hear of small builders being ruined by the burning of a house upon which they were engaged, and in such cases the owner must suffer annoyance and loss outside of the risk which he thought he was insured against.

There is one more remark which may be made, about the forfeiture clause, which gives more trouble than any other in most cases. This is usually inserted to enforce the completion of the work on a given day, but a similar stipulation is sometimes made to guard against the workmen driving over the grass, or leaving shavings about, or in other ways interfering with the real or imaginary interests of the owner.

It is very common to have a client thoughtlessly insist upon penalties out of all proportion to the loss inflicted upon him by the failure of the contractor to keep his agreement. Every one has known the man who undertakes, late in the season, to build a two thousand dollar country house for immediate occupancy, and, in his eagerness to insure its being done by the time he wants to live in it, demands that the contract shall include a forfeiture of twenty, fifty, or a hundred dollars a day for every day's delay beyond a certain date, ignorant of the fact that by fixing an unreasonable penalty, he loses the chance of exacting anything in case of default. The law presumes that the forfeiture is intended to be an agreed measure of the actual pecuniary loss which the injured party will suffer in case of the failure of the other party to complete his contract, as, for instance, in the supposed case, the amount of the rent which he would have to pay for another house while he was waiting for his own. It will allow him nothing for the injury to his feelings at being disappointed, or for

having to postpone visits from his friends, and if the builder can show that the stipulated forfeiture is clearly unreasonable, a court will reduce it to the actual pecuniary damage.

If the owner is careful to make the forfeiture so moderate that it will pay his house-rent during the delay and leave a little over to console his injured feelings, he may hope to keep that by reason of its being too small a matter for the builder to fight about, but if it should be large enough to be worth a struggle, he is pretty sure to lose it.

It is greatly to be wished that more exact systems of contracting, specifying, and estimating work could be brought into common practice. Actions on building contracts are much too frequent, and would be still more so but that the owner, finding that if the decision rests with a jury, the contractor almost invariably wins, regardless of the evidence, makes the best compromise he can, in case of dispute, rather than be brought into court; and of the inadequacy of our common specifications and estimates the enormous differences between the bids of competing builders in the case of every large building, and the long bills of extras at completion, give striking evidence.

It would seem possible for architects, by united action, to establish a kind of official schedule of prices somewhat after the model of those kept in the large cities of France. There, after the schedule of quantities is drawn up, the estimates are often made by the bidders offering each so much percentage of discount from the official price list, the party offering the greatest discount being the successful one. Although this could hardly be done here, the difference between this scientific proceeding and our wild figuring, where the estimates vary two or three hundred per cent, and the lowest bidder is not unlikely, after his contract is signed, to claim that he "forgot to count in the roof," or "added up a column of figures wrong," is sufficiently striking, and the advantage in the case of extra bills, and for the architect's own approximate estimating, is very considerable. With such a table of prices and a number of forms of contract from which the architect could choose one applicable to each particular case, our labors would be much lightened, and their results better secured.

AMERICAN DRAMATIC THEATRES.¹ I.

"Modern theatres, so far, at least, as concerns their internal arrangements, are the only important buildings in modern times designed wholly without reference to precedent, and regarding which an architect really must think what is best to be done and how he can best do it. It hence arises that in speaking of them we must revert to our old principles of criticism, and explain their peculiarities as if they were the works of reasoning men and not the products of copying machines."—*Fergusson's History of Modern Architecture.*

THE modern theatre, in its best possible estate, furnishes a form of amusement which attracts and moves alike rich and poor, learned and simple. Fitly spoken words, strengthened and intensified by the carefully studied tones, gestures, and facial expressions of the skilled elocutionist, are more potent in their effect on the soul of the hearer than any other known influence. But when such words are embodied in a noble dramatic work; when to the graces of numerous actors and actresses are added the interest of stirring plot, of tasteful dress heightening the effect of personal beauty, of changing scene and of fitting and stimulating music, there results a form of entertainment unrivalled in attraction and powerful in the community for good or evil. It will be well for the progress of civilization when the influences now feebly and ineffectually opposed to the drama shall be turned in the direction of the support and encouragement of all that is best in it.

To the quick apprehension and keen sense of humor of the American a play becomes for the moment reality, and serves for the time, better than any other form of relaxation, to relieve him from the strain of overwork, and give that rest that can be had by an entire change of thought and interest from ordinary channels better than by mere inaction.

Until within a very few years almost everything that was considered of importance or value in the dramatic world was imported. Theatres were built and managed after European models, mostly borrowed from London or Paris. The presiding mechanical genius, the carpenter or machinist, the "handy man" of the stage, was often the architect of the auditorium; and was sometimes fairly successful in that capacity. In his ordinary work he was forced, by the high cost of labor and the necessity for the cheap and rapid reproduction of the scenic effects of elaborate foreign plays, to exercise his ingenuity in the improvement of the old complicated and somewhat cumbersome machinery. In this he achieved such success that the work done in a London or Parisian theatre by a dozen men is often accomplished here by one half that number. From this forced departure from foreign precedents on the stage, and some peculiarities of auditorium originating in the demands of American audiences for comfort and equality, a certain independent style of theatrical architecture originated, displaying good and bad qualities both distinctively its own, but which, however prominent the errors may have been, kept steadily in view the practical uses of the structure and the rights of the play-going public.

Mr. John Oxenford, in a letter to the *London Times* in 1867, says that the New York theatres are "light, commodious, and so arranged as to allow nearly the whole of the audience a good view of

the stage;" qualities which by implication he denies to many at home; although commending the same good points in some late English examples: the Alexandra of Liverpool, by Mr. Salomons, being specially praised.

Mr. Boucicault in his testimony before the British House of Commons Committee, in 1866, says of American theatres, they "are very much more comfortable and larger and better ventilated; they are better in every respect; they have wider entrances," and so on. And again, that "the American theatre is more airy. I suppose they began with a better model." The comparison drawn is with London examples.

Having then started with "a better model," the secret of our future success in the arrangement of these places of amusement must lie in a certain simple and practical treatment of the problems involved, aside from considerations of precedent, and regarding chiefly the most direct methods of adapting means to ends. It may be years before we equal or excel our transatlantic cousins in the art qualities of our dramatic temples; it must be many years before private enterprise will be encouraged to build for profit such elegant and durable structures as those of Paris; but in matters of convenience, comfort, and a reasonable approximation to safety we are less hampered, and may hope for rapid improvement.

It must be borne in mind, then, that the scope of these papers does not embrace such monumental buildings as are erected, supported, and directed by a nation without regard to any money return on their cost. The time has hardly arrived when our government officials can be entrusted with the fostering care and patronage of national opera. The ballot and the ballet can hardly go together as yet.

Though an architect be guilty of many sins against comfort, health, and safety in the department of church building; though he may find a congregation prosperous and leave it swamped in debt, still if he display a certain cleverness in scenic effects, and enterprise and shrewd management in competitions, he may not suffer much pecuniarily; and if his professional conscience be sufficiently hardened he may enjoy a moderately prosperous career. But in the matter of theatre building the parties interested will stand no such trifling. The venture must pay as a commercial investment, or the designer is likely to find little further demand for similar services from him. A competition in theatrical design is an especial absurdity, and the projectors of such works, feeling their inability to cope with the problems involved, or to judge of their ultimate success from the intricate drawings required, take what is the only common-sense course in all such matters, and secure the services of the most competent and experienced professional adviser available.

In addition to the business demand of the ordinary amusement-loving public and the managers, there must be considered in the same connection the wants of amateurs. The future Garricks of country town-halls demand better accommodations for the display of their budding talents, and, with their constituents and admirers, are ready to invest, if not in a theatre at least in an "opera-house," music-hall, or "academy of music;" these high-sounding names often indicating a regular theatre, so far as arrangement and design can make one, and usually not of the first class. This amateur element is of no mean importance. It furnishes an intelligent, and in some cases a cultivated, set of recruits to the regular stage. It stimulates an interest in and increases the profits of the theatres; and, by proving to the aspirant that great success in this, as in any other calling, can only be obtained through hard and persistent labor, it leads to greater respect for what is really worthy of admiration, and thus raises the popular standard of excellence. It must be borne in mind, therefore, that the larger number of the halls to be built in the future must be arranged conveniently for dramatic entertainments.

In the early days of American theatrical enterprise, as has been stated, the English system was strictly followed, but the peculiarities of national character soon promoted decided variations from the old types. The regular drama found among the care-laden workers of the new world a powerful rival in the mirth-provoking negro minstrelsy, which in turn gave place to the "variety business," the latter to be followed and surpassed by "extravaganza," "opera bouffe," and "burlesque." To the careful observer of the wants and ways of the people, these phases of entertainment, with all their lights and shadows, both intellectual and moral, indicate a certain progress towards desirable ends; and to-day the theatre is advancing slowly to a hopeful place in American civilization.

In the changes plainly foreshadowed, the railroad and telegraph, combined with a Yankee facility of invention, must have a marked influence on the "show business," so called, and are likely to give a decided and exceptional character to the buildings devoted to such uses.

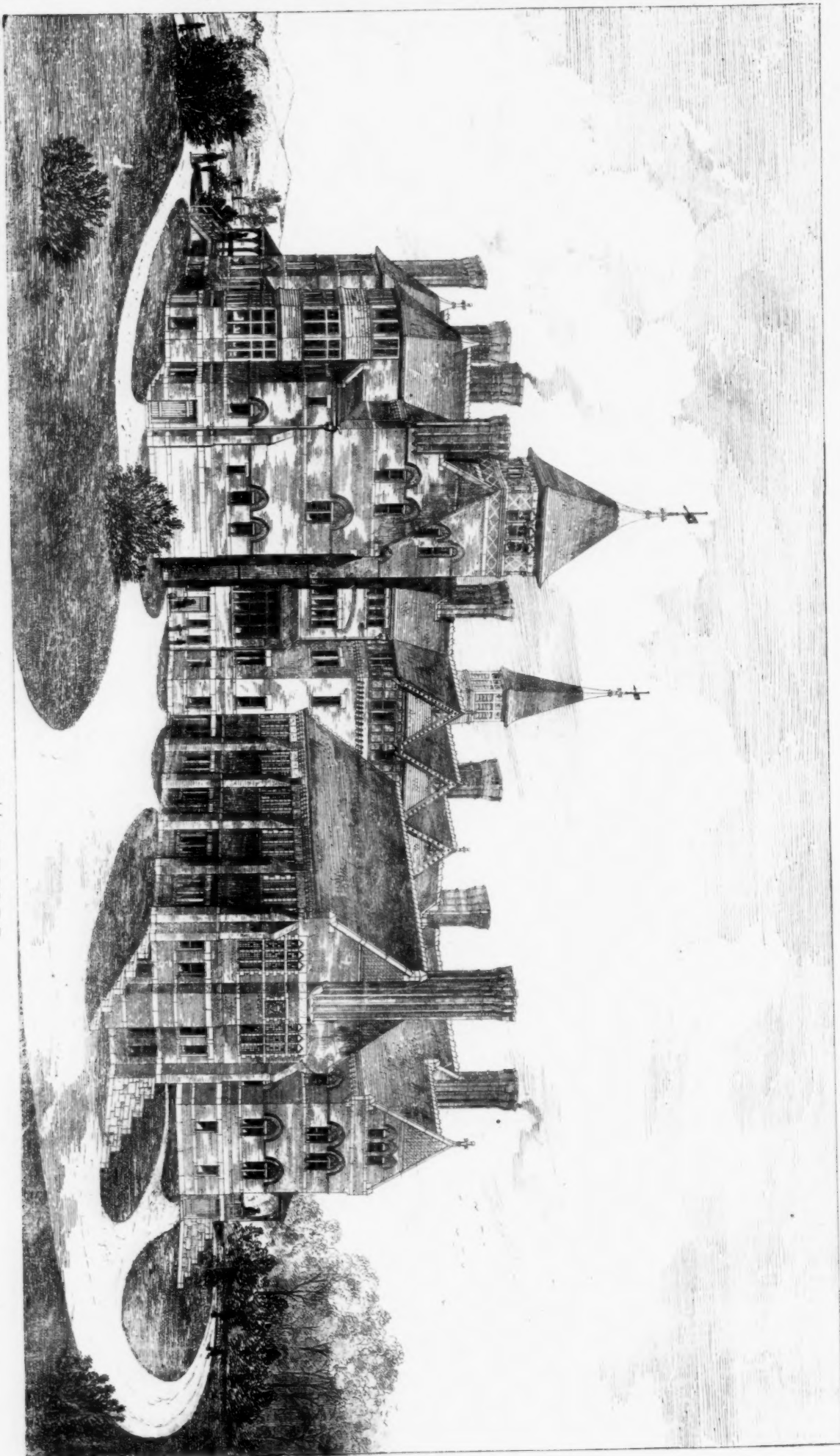
Another peculiarity of the new condition of things lies in the fact that to a great extent the capitalist or adventurer has supplanted the professional player in the conduct of theatrical ventures. Whether this transfer of the management to the speculator is likely to elevate and improve the actor and his art is most questionable. But the architect has to deal with given conditions, and it is undoubtedly the tendency of our imperfect civilization to encourage the inexperienced to take up any new calling that may promise to the fortunate or the unscrupulous a short and easy road to wealth. Thus the carpenter, without special preparation, assumes the name of architect; and where the theatrical manager was once an actor of more or less eminence, he is as likely now to be a tradesman or mechanic.

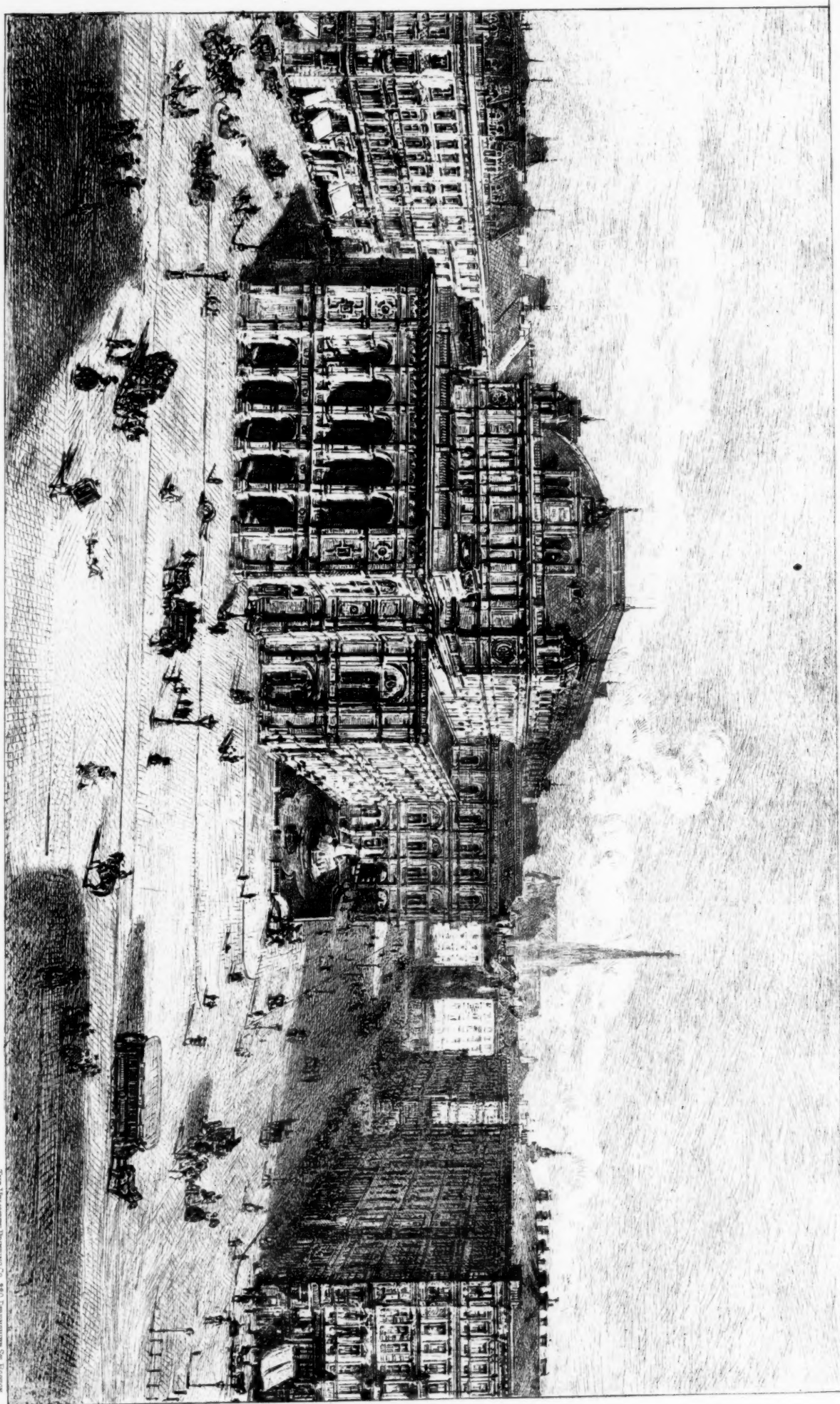
¹ A paper on the above subject, read by Mr. John A. Fox at the April meeting of the Boston Chapter A. I. A., is the basis of these articles.

2

THE ILLUSTRATED BUILDING CO.

ORPHAN ASYLUM AT HARTFORD
F. H. KIMBALL, ARCHT





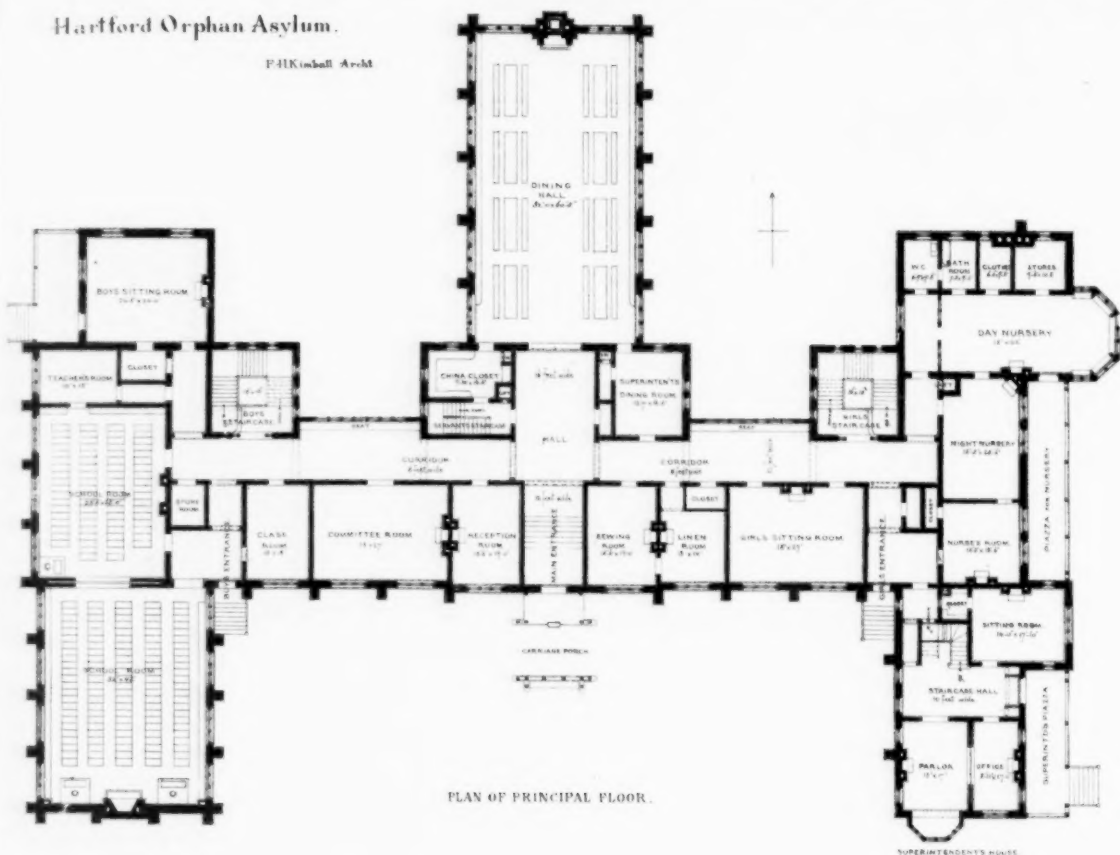
OPERA-HOUSE AT VIENNA

DESIGNED BY HERMANN E. VON DER NÜLL AND A. VON SICKARDBERG ARCHT'S

THE HENNINGSEN PRINTING CO. 220 DEVEREUX ST. BOSTON

Hartford Orphan Asylum.

F.H. Kimball Archt.





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A few years ago our country cousins were obliged to visit Boston or New York if they wished to see a good play well presented. To-day the play, with players, scenery, properties, and orchestra, is furnished at their doors. The "stock company" is almost a thing of the past, i. e., as a local institution, and has given way to travelling "combinations." The actor with his paraphernalia is as common a patron of railroads and hotels as the "drummer" with his sample cases. This change results from natural causes. Only the larger cities can support good dramatic companies, but any railroad town of five thousand inhabitants can, at reasonable expense, build a hall well suited for the uses of such companies; and such a building answers all other requirements of public assembly, except for dancing, and this can easily be provided for in smaller rooms.

The place being provided is speedily availed of and made profitable. A metropolitan manager produces in New York or Boston a new play at great expense, and with actors specially engaged and qualified for their individual roles. On the piece are lavished all the resources of the scene-painter's art, the machinist's invention, and the costumer's skill. An orchestra of the best musicians and new and original music are provided. The venture perhaps fills a profitable season, is thoroughly advertised by posters and lithographs, as well as through the press, and then gives way to a new company and play in turn. But its career does not end here: it is transported by rail to every town that can furnish a hall and an audience; and from Maine to California the most popular dramatic works and actors, formerly confined to the largest cities, become as familiar in the country as the lyceum lecture or the Old Folks' Concert.

Leaving out of consideration then those of the larger theatres, which are better adapted for grand opera, spectacle, and ballet than for comedy, vaudeville, and farce, we find a growing demand for buildings suited to the latter class of works; a class, it may be said, specially adapted to the wants and tastes of Americans. Such buildings must be safe, not too large, comfortable and convenient, and as bright, cheerful, and attractive generally as circumstances will admit. The study of old examples and the experience of the past is of course useful in a degree. But the new problem varies widely from the old; and the architect who uses the past as a reminder of what to avoid, as well as to imitate, and applies himself to meet the new demand in the most straightforward, practical, and independent way, is on the best road to success.

J. A. F.

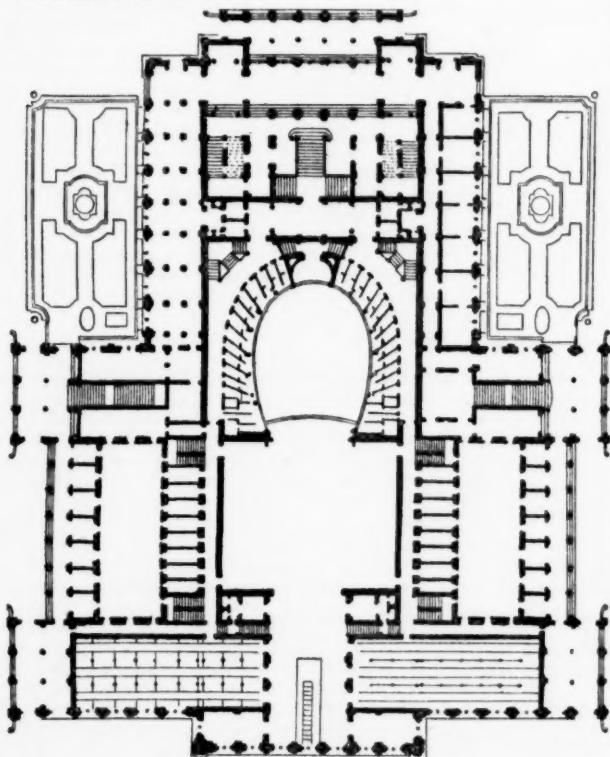
THE ILLUSTRATIONS.

THE HARTFORD ORPHAN ASYLUM, HARTFORD, CONN. MR. F. H. KIMBALL, ARCHITECT, HARTFORD.

A FULL description of this building was published in our issue for November 23, 1878.

THE NEW OPERA-HOUSE AT VIENNA, AUSTRIA. HERREN E. VON DER NULL AND A. VON SICCARDBURG, ARCHITECTS.

This reproduction of Herr Rudolf Alt's etching is introduced as a type of the national theatre mentioned in the preceding article, "American Dramatic Theatres."



Plan of the new Grand Opera-House, Vienna.

CORRESPONDENCE.

ANCIENT TROY.

KOUK KALEH, DARDANELLES, June, 1879.

THE mouth of the Scamander at this place is the nearest point of the coast of Asia Minor to the Acropolis of Troy. High hills intervene between the city and Besika Bay at the west, which may be almost as near, and these render this corner of the Dardanelles at all events the most natural seaboard. Here the fleet of the besieging Achæans was probably stationed, dragged up on shore out of the reach of storms, just as are the coasting vessels of the Greeks of to-day, mariners whose nautical customs have, in more than one respect, been handed down unchanged from their ancestors. What Homer tells of a prehistoric voyage might stand for quite an accurate description of going to sea in a modern vessel of Tenedos or Cerigo. The famous Scamander is now but a small stream. It must have greatly diminished since the day when, rising in wrath at blood-stained Achilles, it could completely overflow the plain; a diminution readily accounted for by the destruction of the forests which once clothed its source on Mount Ida and protected its upper course. Kouk Kaleh itself contains many a marble fragment, which attests the vicinity of the later Ilium. The work of rounding off architectural members into cannon-balls is still carried on: great heaps of such destructive munition lie in the battered Turkish fortress which is supposed to command the entrance of the strait. Well-curbs and troughs, the quoins and thresholds of the houses, the very mortars in which the primitive villagers ground their wheat and coffee, were once Ionic vases, neatly fluted drums, blocks from every part of the characteristic temple structure of the Greeks. Hissarlik is not a village, has not been since Dr. Schliemann's arrival; he swept away the few miserable huts that were then standing, and Hissarlik is now merely the local name of the eminence which is assumed to have been the Acropolis of ancient Troy,—certainly was of the Greek Ilium. Its truncated cone becomes visible as one passes through the narrow streets of Kouk Kaleh. Long files of camels stalking out towards it with nothing will return heavily laden with the produce of the grain fields which cover far and wide the plain of Troy. The rough road crosses the river and its branches several times; the bridges, when of stone at all, are of the finest. The camel grinds a carved fragment of an Ionic cornice beneath his hoofs; he is ill at ease, nevertheless, for he is obliged in this poor country to provide his own saddle,—a square patch of hair being left upon a suitable spot of his back when the unhappy animal is sheared.

Hissarlik is at the end of the plain, a spur of the Mountains of Mysia. It looks from afar as though mining operations were carried on there, the displaced earth of the excavations, which has been shot over the steep side of the hill, making it a conspicuous point in the otherwise green and fertile landscape. It is eight kilometres along the winding path from the sea to its foot, according to a pedometer, though in a direct line it can be no more than seven,—some four miles,—just the distance of the Acropolis of Athens from the Bay of Salamis. Of the two situations that of Troy seems almost the more favored by nature. It stands in the midst of a widespread and beautiful country, watered by numerous springs and by a river which is still larger than any stream of the Peloponnesus. It is protected from the scorching breath of Arabian deserts by the mountain range of which Mount Ida is so prominent a peak, and is open to cool and steady breezes from the northeast, the prevalent wind of the summer months, which comes from Russian steppes over the Black Sea to seek the more rarified atmosphere of Asia Minor. These broad plains are even to-day a grain magazine for the whole surrounding country, while the hills behind are covered with fruit trees, many of the most familiar being here indigenous: from this small tract were derived our cherry, apricot, and filbert trees, as well as the more humble spinach and asparagus.

The ancient city was sufficiently distant from the port to feel secure from sudden descents of marauding enemies or of pirates, though near enough fully to profit by its commerce. Every vessel passing the Dardanelles, the great high road between the east and the west, is distinctly visible. On clear days, incredible as it may appear, Mount Athos may be seen at a distance of far more than one hundred miles. The view from the citadel of this great garden, uncultivated as much of it now is, is wonderfully beautiful and interesting. Technical disputes as to whether the hill of Hissarlik or that of more remote Bournabashi was the scene of Homer's story cannot greatly concern us; the former is certainly by nature the commanding site of the Troad. To use Dr. Schliemann's words, he has indeed "dug up the whole city." The results of this labor are, in architectural respects, disappointing; it would be beyond my province to discuss the far greater contributions which have been made to archaeology and anthropology. Of the first two Troys absolutely nothing has been found that can be spoken of as architecture. These primitive cities were evidently wholly constructed of wood, and a thick stratum of ashes is all that is left of their buildings. The cut stones that have come to light belonged to edifices of the later Greek Ilium, and even of these there are but fragments, nothing that can be presumed of earlier date than the fourth century B. C., while most is much later.

The decadence of Greek architecture is already too well represented in proportion to the few remains which show the character of the developing art, of the styles before they degenerated into for-

malism. We would willingly spare the ruins of Messem, Thorikor, and Troy for a single stone which could throw additional light upon plan or membership of the Temple of Assos or of Corinth. Unfortunately, at Troy all is both late and fragmentary. One course of stylobate blocks has been left in position upon the crest of the hill, now almost entirely dug from beneath them, but these give no clue to the size or disposition of the fane. It was alone by the discovery of the plans that similar results of the Samothrace expedition gained sufficient weight to justify their publication. That which has been found here will probably never thus be collected and made known in a monograph, as restorations are impossible.

The oldest fragments are not marble, but are of a coarse tufa-like limestone, similar to the Greek *poros*, which seems everywhere to have preceded the introduction of the finer material, being brought to a smooth surface by a heavy priming of stucco. Arrian relates, that when Alexander the Great visited Ilium, on his way to India, in 334 B. C., he saw there a "tiny" temple. Remains of this are thought to be recognized in some Doric members cut out of the coarser stone, which are indeed on a very diminutive scale. If the supposition be correct, this monument alone is of earlier date than the time of the Diadochii. The only bit of it I could find was a broken triglyph and metope, the forms of which show conclusively, to my mind, that it was not cut before the middle of the fourth century, although the learned gentlemen connected with the excavations had, on account of the rough material, assumed it to be older. The height of the frieze was 0.345 m., less than half that of the Theseus temple. This would correspond, in a structure of late proportions, to a shaft of about three metres, the intercolumniation being merely a door-like passage. M. Burnouf, a scholar well known to architects by his early publication of the Parthenon curvatures, in the *Revue des Deux Mondes*, assured me that other pieces of this curious little temple had been found, a block of the cornice, a much mutilated capital, and several drums; he kindly gave me the measurements which he had taken when they were first unearthed. These stones have been rolled down the chute and were not to be found. This I regret, as M. Burnouf had not observed the number of the rings, or the character of the echinus of the capital, and some of the less important dimensions had escaped his attention. The capital of a Doric temple is as the head of the human figure, most quickly conveying an impression of its nature. The drum had twenty channels, and remained in the polygonal state, the building then not having been entirely completed at the time of Alexander's visit. The diameters varied from 0.54 to 0.6 m. This is not at all an archaic proportion to the frieze or to a cornice projection of 0.18 m.; in fact if the norm had not been late and attenuated it would have been impossible with shafts of such small absolute thickness to have provided the requisite height of passage. The later remains are of a fine-grained and perfectly white marble, a beautiful building material, reported to have been brought from the mountains of the southwestern Troad. Were this the case the transportation of its immense blocks must have been a matter of considerable difficulty. The upper Scamander was always too shallow to support laden boats, too narrow for the passage of rafts. The Greeks did not, I believe, use camels as beasts of burden, and these animals are at present the only means of conveying heavy loads from the interior. In default of any positive information, it may be held more probable that the stone came by sea, perhaps from Thasos, an island which provides this quality of marble, and was always the quarry for this part of the Mediterranean. The remains consist of Doric shafts,—the largest belonging to a temple which must have been nearly the size of the great order of the Athenian Propylæa, a random drum having a diameter of 1.18 m.,—of capitals with the straight-lined echinus characteristic of post-Alexandrian work, of Ionic columns, both free and partly engaged, and of numberless caissons, architraves, and wall stones. An uncompleted Doric cornice shows the ancient stone-workers' method of laying out, by a system of outlines, the guttæ, when these were of one block with the mutule. The cutting is as a rule exceedingly good, but all these members have the flat and conventional forms which make them so worthless. Of greater general interest is a sculptured metope, similar to the one previously found, widely known as Apollo and the horses, but this carving is inferior and so much defaced that it is hardly worth transportation. It represents two figures in combat; one, fallen upon one knee, is seized by the advancing adversary. Judged in the present mutilated condition it appears a work of but little artistic merit. Such are the meagre architectural results of the excavations at Hissarlik. There is really almost more of the marble Ilium in the Turkish graveyards of the plain than Dr. Schliemann has unearthed, the better fragments having been carried off, year after year, to do reluctant duty as gravestones. In one of these fields I found the missing capital of the great marble temple, besides several inscriptions on pedestal shafts. My visit happened on the last day of the Doctor's stay at Troy. His work is completed, the season advances, and he goes never to return. His thoughts are directed to Sardis, where there can be little doubt that his untiring labor and immense expenditure will be more richly repaid. The workmen who have here dug up the whole city have long since dispersed; and soon the familiar attendants, Hippodamia, the cook, and Pelops, who serves at table (a name full of ghastly associations in such an office), will leave the scene of their ten years' labor. It has taken just as long to excavate as it once did to besiege Troy. The trenches will remain open, by special permission of the Ottoman government, an advantage, though

it may be improbable that further researches will ever be undertaken. The honey-combed Aeropolis and the perforated tunnels will at all events long bear witness to the enormous labor expended upon them in the interest of science.

I desire to thank Dr. Schliemann for the politeness and hospitality which he showed to the obscure foot-traveller who passed his door at the most vexatious of all times,—the hour of hurried packing.



DR. SCHLIEMANN'S EXCAVATIONS.

"HERE at Troy I have continued the excavations with the utmost energy, but with less success than formerly, having this time found only two treasures of Trojan gold jewelry, and Ilium appears now to be exhausted. Both treasures were found in the presence of Professor Virchow and M. Burnouf. The first treasure was struck at a depth of only 13 feet 4 inches below the surface, on the east side of my excavations, in that part of the ground where a considerable portion of it, 6 feet to 10 feet thick, had evidently been cut away when the temples of Minerva and Apollo were built, because in some places the calcined débris of Troy follow there abruptly below the stratum of Hellenic ruins. The treasure lay on the ruins of a house-wall, which seems to have fallen from an upper story; it consists of three gold disks in the form of flowers, 4½ centimetres in diameter, of embossed work and much like the disk numbered 251 in my 'Mycenæ'; further, a gold head-ornament, 'plekté anadesmé,' 18 inches long, the upper part of which is in the form of a basket and ornamented with small gold rings, which are soldered on and filled with a substance of white glass. The latter has probably had another color, and may have been blue. From this ornament are suspended ten gold chains, each of which is composed of 155 links, and each link is covered with a gold leaf; consequently, there are 1,550 links and as many leaves on this beautiful head-dress. At the extremity of each chain is suspended a gold idol 3½ centimetres long, with two eyes well indicated. There are, besides, the fragments of seven much larger gold idols. This gold head-dress had, by the inadvertency of the laborer, been thrown with the débris on the wheelbarrow to be thrown away, when, most luckily, it was perceived by the keen eye of Professor Virchow, who saved it for science. The second treasure was found, at a depth of 33 feet 4 inches below the surface, on the slope of the great wall, to the northwest of the gate. The most curious object in this treasure is a silver spoon in the form of a bowl, having in the centre an embossed ornament much resembling a Trojan shield (*aspis omphalessa*; see the engraving No. 234, Plate 14, in my 'Troy and its Remains'); it has a very long handle, which terminates in a large ring, and which is ornamented with a tree nicely engraved. This spoon is unique in the world; it seems to have served for libations, for it can never have been employed for domestic use. The treasure further contained two gold ear-rings of very large size, each formed of seven serpents; two others, ornamented with rosettes, and four or five chains with idols at the ends; other gold ear-rings without pendants; a gold ring for holding the locks; a gold frontlet; ten gold ornaments, each with four spirals similar to No. 297 in my 'Mycenæ'; two enormous, very heavy gold bracelets, consisting of very thick gold wire, having only at one extremity an ornament in the shape of a flower button; a large quantity of gold beads and rings, six silver ear-rings; a large silver bracelet; and, finally, hundreds of silver rings, which must have been strung on a thread, because all are fused together in long rows. To all this silver jewelry have been fused in the conflagrations numerous gold beads, also one of the gold ornaments like No. 297 in my 'Mycenæ.' Of other curious objects, I may mention a long dagger of silver, the extremity of the handle of which represents a cow with long horns; a rude idol of trachyte, eight inches long; small animals modelled of black clay, such as dogs, cows, rams, lions, etc.; a very curious vase, six inches high, with very large eyes and a perfect owl's head, on which is fixed a small cup or bowl, forming the mouth-piece; it has around the neck a fourfold necklace, it has two breasts, and the arms run out into two handles, between which, precisely in the place of the navel is a nicely-shaped funnel or spout. I may further mention a rattle-box of terra-cotta, having the form of a woman.

"What astonishes Professor Virchow and M. Burnouf here are not so much the hundreds of house-walls which have been built in all directions in the course of ages, as the monstrous quantity of bricks, which solely occur in the burnt city—the city suddenly destroyed by a fearful calamity, the city in which ten treasures were found; and this is the second city in succession from the virgin soil. Although the different layers of the first city compose a mass of débris 23 feet deep, yet I never found there a brick. Neither are there any bricks in the two uppermost pre-historic cities. Having in company with these friends most carefully examined many heaps of bricks, we have all three become convinced that the latter have been slightly burnt in ovens before having been employed for building, because they are too uniformly burnt to admit that their burning should have been produced solely by the great conflagration; besides, even in compact masses of bricks we never found a raw, merely sun-dried brick. We have, besides, never found a single brick in its place, because the substructures of the houses were of stones joined for the most part with pure clay, but in a very great many cases, also, either with clay mixed with weeds and prepared for brick-making, or with a cement of crushed bricks, whereas all the upper stories were of bricks, and

were held together by their floors of beams, covered with a layer of clay to make them smooth, for the prehistoric man had no saws or other instruments to make planks, and least of all the Trojan. Trees cannot be cloven to planks with stone axes such as we find here, for their wood forms a sort of helix. Besides, we have in the pre-historic houses brought to light at Thera (Santorin), below three strata upwards of 66 feet deep of pumice-stone and volcanic ashes, the most certain proofs that the floors consisted of beams, and not of planks. Now, by the white heat engendered by the burning of the many floors of beams, all the bricks fell together in confused masses, and, by the silica they contained, they became in many places even partly vitrified. The ligament with which the bricks were joined consists of clay mixed with weeds, and Virchow and Burnouf think that this clay is nothing but a sort of cement made of crushed bricks mixed with water. In several places we find even Trojan house-walls of stones built on heaps of debris of such slightly burnt bricks, and this would point to partial fires long before the great conflagration. The skill the prehistoric peoples here had acquired in consolidating the loose ashes and debris by interposing portions of liquid clay is really astonishing. In fact, this strange process of rendering ashes hard like stone has been in practice here by the inhabitants of all the four prehistoric cities from the virgin soil to the uppermost layer. I still call visitors' particular attention to the Trojan street, 4 feet 9 inches broad, paved with large flags which bear the marks of the white heat to which they have been exposed. This street may be seen just above the ruins of the first city on the east side of my great trench."

CHAPEL ARCHITECTS.

FIRST, a committee is appointed, chiefly of men wholly unacquainted with the work before them. Contributions come in well. The power of the voluntary principle is illustrated. The committee meet and talk over what is before them. There is no disagreement as to what they require, but very little agreement as to how it can be secured. Deacon A., who has never done such a thing before, sketches a plan in pencil. It is an oblong building, fifteen feet by forty five feet; he thinks it would seat about nine hundred on the ground floor, and that side galleries could afterwards be added. Brother B. has sat up all night with some red and black paint, and produces a cruciform building like a cathedral, with two rows of piers shutting out the view of the pulpit from numbers; he altogether overlooks the need of a porch, and places the school-room under the chapel, making no provision whatever for lighting it. Another member gets his daughter to draw out a sketch of a Wesleyan village chapel, very pretty, but with the windows overlooking a neighbor's ground, all of which would be blocked up at once. The committee discuss and discuss with considerable development of patience and temper. At length a neighboring gentleman sends a promise of £10, and strongly recommends a friend of his own, who, he says, is a rising and gifted architect, and would undertake the work for half the regular fees. The architect sends for inspection a number of pictures he has drawn, and, being tolerably clever at water-color drawing, they look well. He is invited to meet the committee. "What kind of a building do you need?" he asks. Says Deacon A., "We want a good, substantial building, with none of what I call frippery; no useless ornamentation, no foolish pinnacles and what not; but a plain, handsome place, that shall be an ornament to the town." "Exactly so," all the others respond. The architect, if feeble in skill, is shrewd enough to measure the meaning. He sees they know nothing about it. For whoever wanted a building that was not good—that was not substantial? Whoever wished for frippery and foolish ornaments? Who would not be delighted to secure a place that should be plain and handsome, cheap, and yet an ornament to the town? So the architect engaged them for half an hour in technical expressions. Very soon they were all out of their depth and overwhelmed with his learning and genius, and he left them promising a design on approval. Within a week the design came. Purposely it had some very obvious defects. The pulpit six feet two high, and the vestry door very awkwardly placed. The committee were dazzled with the first sight of the well-painted picture. Deacon A. suggested that the pulpit should be lower. Another thought the entrance to the vestry could be altered with advantage. The architect flattered them on their penetration, altered the design, cut off some two pinnacles (which he had never intended to keep on the plan), said that those alterations would diminish the expense by some £500, and the design was accepted and signed. The contract was taken by a builder who saw at once what was to be done. He knew well the measurements would never do; the strength was all in the wrong places. As he went on with the work this became evident enough; had he completed it the roof would assuredly have fallen in. From the time this became apparent, the architect and builder understood one another, and pulled through pleasantly together somehow. The result was a well-built place without any frippery, and most people were satisfied. The porch was Saxon; the side windows were Early English; on the south, opposite to the pulpit, was an immense perpendicular window, summarily to bring the sermon to an end by blinding the preacher at noonday; the vestry was Tudor, and the gallery was supported by Doric columns; an Italian lantern crowned the whole. As for draughts and acoustic arrangements—well, they were trifles left to take their chance. It was a fact that a noble place, in pure style, could have been built for

the same sum of money. Principles of comfort and hearing might have, without extra cost, formed part of the plan. But nothing was contributed to the knowledge or increase of taste in chapel architecture.—*The Freeman*.

GAUGED MORTAR AND IRON.

Boston, July 12, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir,—In a letter to E. A., printed in to-day's *American Architect*, Mr. C. H. Waters, Vice-President of the Clinton Wire Cloth Company, couples with the opinion of C. in relation to the corrosion of wires, when used as lathing, the following words uttered by me in an address delivered at Syracuse on the 20th of last May: "It is also liable to decay through the action of sulphate of lime in gauged mortar." He then proceeds to demonstrate that gauged mortar does not corrode iron wires, calling it a reply to both of us.

If Mr. Waters had read my address more carefully he would have seen that my remark applied to sheet-metal used for lathing, and not to wires. Had he read further on, where I compared sheet-metal with wires when used for this purpose, to the prejudice of the former, he would have found these words: "Wires are less destructible than sheet-iron, because it is necessary to use wires having more body of metal in them than in the sheet-iron that would be used for lath." Also, "One advantage of wire lathing over any other is, that any desired amount of mortar may be forced through the meshes and above the wires."

I may add also that I advised plastering on solid bodies, such as porous tiles, of concrete or clay, in preference to any kind of lathing.

Respectfully yours,

P. B. WIGHT.

THE NEW BRUNSWICK LEGISLATIVE BUILDINGS COMPETITION.

St. John, July 7, 1879.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir,—The designs for the above were sent in on the first of February of this year, and I understand lay untouched until the Parliament met, about a month later. They were on view during the time the Parliament was sitting, and now some months have elapsed since the House rose, but as yet no decision has been announced. A few days since one of the competitors complained in a St. John newspaper of the delay.

I am not sure if any competitors have reason to complain, for, although the committee said three prizes would be given for the best designs, they did not say *when*.

How do you generally manage these things in the States? Suppose, for instance, designs were asked and premiums offered for a new town-hall in Boston, and after half a year had elapsed without any decision, would the competing architects complain? I should be glad to have your opinion, or that of your readers, on the subject.

I am, yours, etc.,

NEW BRUNSWICKER.

[We have no doubt that the architects would complain, but we do not see that they could do anything more,—except to withdraw their plans when they grew tired of waiting. Such delays in competitions are not unknown among us, though fortunately they are not very common.—Eds.]

PUBLICATIONS RECEIVED.

RURAL HYGIENE, by Charles F. Wingate, editor of the *Plumber and Sanitary Engineer*. A paper read at a meeting of the Citizens' Health Association of the Oranges, Bloomfield and Montclair, on the evening of May 1, 1879. Sanitary Tract No. 1.

FOUNDATIONS AND FOUNDATION WALLS for all Classes of Buildings, Pile-Driving, Building Stones and Bricks, Pier and Wall Construction, Mortars, Limes, Cements, Concretes, Stuccos, etc. Sixty Illustrations. Practical Explanations of the Various Methods of Building Foundation Walls for all Kinds of Buildings; Tables of the Weight of Materials, etc. The Kinds of Materials Used, the Loads Sustained, and the Sizes of the Wall-Piers, etc. Use of Piles in Foundations, with Terms, etc. Plastering, Mortars, Limes and Cements; Extracts from New York Building Laws, with Notes. By George T. Powell, Architect and Civil Engineer, New York. To which is added a Treatise on Foundations, with Practical Illustrations of the Method of Isolated Piers as followed in Chicago. By Frederick Baumann, Architect. Revised by G. T. Powell. New York: Bicknell & Comstock, Publishers. 1879.

NOTES OF EXPERIENCE AND INEXPERIENCE.

27. AUTOGENIC SOLDERING.—What is the process of autogenic soldering which is not described in Part III. of "Notes on Building Construction," lately reviewed in this paper? PLUMBER.

28. INSURANCE AND LIGHTNING-RODS.—Do the fire insurance companies grant better rates to buildings which are provided with lightning-conductors than to those unprotected? When examining a building before taking a risk on it do they test the lightning-conductors? What method of applying lightning-rods has their experience taught them to be the best? W.

29. DRY-ROT.—Does dry-rot ever cause spontaneous combustion? Does the mortar used for deafening floors usually cause dry-rot? If it do, does it attack both upper and under floorings or only one of them? O.

NOTES AND CLIPPINGS.

HONORARY MEMBER OF THE FRENCH INSTITUTE.—Mr. D. Ewart, architect in the Department of Public Works at Ottawa, Ont., has been appointed a life member of the French Academy of Architecture for services rendered in connection with the Paris Exhibition.

THE DOME OF THE HARTFORD CAPITOL.—It has been decided at length that the covering of the dome of the new capitol shall be gilded after the manner of the State House at Boston. The other alternative was to treat the copper roofing chemically so as to cover it with an uniform coating of verdigris. The cost of the gilding will be about two thousand dollars.

DRESSING STONE BY ELECTRICITY.—Among the novel applications of electricity to the industrial arts is a new stone-dressing apparatus, which is worked by a dynamo-electric machine, and which the inventor claims will dress mill-stones or other stones, and drill rock, economically, with rapidity, precision, and despatch. The chisel employed is fastened to a spring arm which protrudes from a case containing magnets and armatures. This spring arm, when the magnets are connected with the dynamo-electric machine, moves up and down with extreme rapidity, causing the chisel to strike a blow at each descent. The inventor states that it can be made to strike from one to two thousand blows per minute. Wires being used in place of steam-pipes enable the apparatus to be moved readily to any angle, or worked at any reasonable distance without much loss of power; while not the least meritorious portion of the whole invention is the horizontal frame or base to which the electric apparatus is fixed. This frame is portable, and by the use of screws can be so adjusted as to cause the chisel to strike any portion of a circle with either a swift or a slow motion, the number and intensity of the blows being regulated according to the softness or hardness of the stone. By the use of this machine it is said that a mill-stone can be covered in a very short space of time with the necessary grooves and furrows, having the straightness, regularity, and parallelism so much desired in good mill-stone dressing. The apparatus can be worked either automatically or by hand, so as to suit the varying natures of the stone operated upon. — *New York Tribune*.

THE POLYTECHNIC INSTITUTE, HANOVER.—The most costly school-building in the world is probably the new Polytechnic Institute in Hanover. The late King of Hanover commenced the construction of a magnificent palace, upon which he expended about \$5,000,000. When his government was overthrown and the kingdom of Hanover became a province of Prussia, the building was found in a half-finished condition. For several years the windows were boarded up, and the empty rooms became the residence of bats and birds. At last the German Government resolved to alter the building and adapt it to the uses of the Polytechnic Institute. The work has been going forward for several years, and is now nearly ended.

THE ÉCOLE DES BEAUX-ARTS.—The École des Beaux-Arts, Paris, is to be enlarged, the sites of two houses facing on the Rue Bonaparte having been acquired. In the building erected on their site there will be one hundred and twenty-eight lodges for the competitions, three studios for painting, three for sculpture, three for architecture, one for decoration, and a room for instruction in ornamental drawing. In the basement will be the store-rooms and the modelling studios.

TESTING IRON AND STEEL BY ELECTRO-MAGNETISM.—Two interesting practical applications of electro-magnetism have recently appeared. In one it is applied to discovering flaws in iron or steel; in the other, to measuring the hardness of steel. The theory of the former process (proposed by Mr. Herring, an American mining engineer) is this: When an iron or steel bar is passed through a coil, which is traversed by an electric current, the bar becomes a magnet. If the metal be homogeneous, the polarity of the bar may be inferred from known laws of electro-magnetism. If, however, there be a want of continuity of fibre at some point, *i. e.*, a flaw, new poles are formed there, which a properly mounted needle will readily detect, also giving a measure of the extent of the imperfection causing these false poles. The apparatus is so contrived, then, that the wire or rod to be tested is passed horizontally first through a magnetizing helix, then through a hole in a block of wood, which supports a nicely balanced dipping-needle as magnetometer. The apparatus is, of course, adapted to the size, weight, and shape of the piece to be examined. In testing plates the helix is flattened, and a number of magnetometers are mounted at short intervals on a bar, which can be moved to and fro in front of the helix, and fixed at any desired distance from it. The new apparatus of Professor Wattenhofen, of Prague, for measuring the hardness of steel electro-magnetically, is a development into more practical form of a former idea of his. Its principle is that hardness of steel may be very correctly inferred from a numerical determination of its coercive force. In its main features, his arrangement is as follows: From one end of a balance arm are suspended successively, in a brass holder, bars of the steels to be examined (these being as nearly as possible equal in weight). The other arm bends obliquely downwards, and bears a constant weight. Motion of the beam causes a pointer to move radially over a scale, the movement being magnified by toothed wheels. One of the steel bars having been suspended, a magnetizing coil, equal to it in length, is raised on a stand so as to inclose the bar, and is fixed with a binding screw when it does. Then a current is sent through the coil; next the coil is released and moved gradually down, pulling the bar with it, till the latter breaks away, and the deflection of the pointer at which this occurs is noted. This affords an estimate of the hardness of the steel. For example, a bar A gives a maximum attraction, 9-6; a second bar, B, 15-5; a third, C, 14-6. It is inferred that A is considerably harder than B and C, and of the two latter C is harder than B. Precautions are taken in the apparatus to prevent injury to the parts from the sudden recoil when the hold of the coil on the bar ceases. — *London Times*.

STONE SPIDER.—It is said that the tomb of Napoleon Bonaparte, at the Hôtel des Invalides, is being eaten away by that which French naturalists describe as a species of stone spider, an insect of which, we fancy, most architects have never heard.

BOOK SALE IN PARIS.—At the recent Firmin Didot sale in Paris, 633,000 francs (\$126,600) were realized from the five days' sale. The remaining portion of the collection, being the fourth, is expected next May to bring the result up to 5,000,000 francs (\$1,000,000). Among the remarkable lots recently sold were Queen Catherine's (wife of Henry V.) missal, which brought \$15,200; the "Manuscrit de Bure," \$5,600; "a missal for the use of Mont-Cassin," \$1,400; a first edition of a work of G. Derandus, \$1,300, bought for Berlin; a missal for the use of the Hieronymites of Spain, \$460, bought for London; a very rare copy of a work printed at Augsburg, \$600; and a "Grande danse macabre des hommes," \$1,045. A manuscript which belonged to Mary Queen of Scots brought \$2,000.

ARSENIC IN WATER-COLORS.—Dr. H. Fleck, in the *Chemiker Zeitung*, calls attention to the danger attending a common draughtsman's trick by the sudden death of a mechanical draughtsman. On a post-mortem examination the cause of death was first supposed to be oxalate, and then a narcotic poison. Chemical investigation showed that the liver, kidneys, lungs, heart, and brain were impregnated with arsenic, though the cesophagus contained not a trace, and the stomach with its contents gave a barely perceptible arsenical mirror. The general circumstances of the case excluding the suspicions of suicide and malicious poisoning, it was found that the deceased had been in the habit, when drawing, of placing the pencil filled with color between his lips in order to point it. The water colors he had used were analyzed, and while Indian ink, gamboge, carmine, blue, red eosin ink, and neutral tint were found perfectly free from arsenic, a sample of sepia contained 3.08 per cent of arsenious acid, terra di Sienna 3.14, and a reddish brown color, the name of which was indistinct, 3.15. Burnt sienna, Vandyck brown, bistre, bladder green, brown ocher, Indian red, umber, raw and burnt, were also found arseniferous. Most of these colors are essentially iron lakes. Hence it appears that the mere presence of ferric oxide, except in a hydrated state and accompanied by free magnesia in quantity sufficient to neutralize the acids of the stomach, does not act as an antidote to arsenious acid. This case seems likewise to prove that arsenic taken in minute doses can accumulate in the system until it can be readily recognized in all organs, and can exert a dangerous action.

COLORING PENCILS.—Herr L. von Faber makes pencils for writing upon glass, porcelain, metal, etc., as follows. — Black: ten parts of lamp-black, forty parts white wax, ten parts tallow. White: forty parts white lead, twenty parts wax, ten parts tallow. Blue: ten parts Berlin blue, twenty parts wax, ten parts tallow. Dark blue: fifteen parts Berlin blue, five parts gum arabic, ten parts tallow. Yellow: ten parts chrome yellow, twenty parts wax, ten parts tallow. — *Dingler's Journal*.

HOW TO MAKE PLASTER OF PARIS HARD ENOUGH FOR TURNING.—Mix with fresh plaster of Paris from two to four per cent of powdered marsh mallow root, then add sufficient water until it forms a mass. This will set in about an hour and become so hard and dry that it may be sawed and turned. It is used in the manufacture of dominoes, dice, etc. When eight per cent of the root is added a still harder mass is obtained, which may be rolled into leaves and painted or varnished. A small quantity of alum added makes it set harder and quicker. — *Canadian Mechanics' Magazine*.

A NEW BRONZING PROCESS.—A new process for the "bronzing" of iron and porcelain, and which can be indefinitely applied in decorative art, has been perfected by Professor Bottger, a German chemist. Its efficiency depends upon the use of an improved solution for causing the bronze or other colored powder to adhere to the article to be bronzed. It is a concentrated solution of soluble glass, prepared with potash, or a silicate of potash. The article to be decorated is first coated with a thin film or layer of the solution of soluble glass, and the bronze or other powder is applied through a sieve or other means; the articles are then dried by exposure to the atmosphere or artificial heat, after which the excess of powder is removed by a brush. The bronze or other powder so applied will resist the effects of heat and of washing with alcohol, or of polishing by steel or agate burnishers. The invention is particularly adapted for decorating iron and porcelain stoves, inasmuch as the powder will not be affected by heat. The gilding on the frames of pictures and looking-glasses when worn can also be restored by this process.

HYDRAULIC TUBING.—G. Parravicini recommends a more general substitution of terra-cotta and cement tubes for those of brick and stone, in sewers, water-ways, and other similar underground structures. Among the advantages which he enumerates are: (1) Reduced cost of foundations; (2) ease of building in running water; (3) saving of time in construction; (4) possibility of carrying on the work in winter and at other times when labor is cheap. — *Il Politecnico*.

ARTIFICIAL LITHOGRAPHIC STONE.—A. Regel, of Gotha, has found that artificial plates of Portland cement may be used with advantage in lithography as a substitute for the costly Solnhofen stone. — *Dingler's Journal*.

A NEW DANGER-SIGNAL.—A French engineer has devised an instrument for stopping trains in foggy weather, without any chance of failure. The instrument consists of a metal-faced disc rising out of the permanent way between the lines of rail, and placed so that any engine going along the line must brush against it in passing. The engine is provided with a brush for this purpose, made of iron wires, which has an electric communication with the handle of the whistle. In order to bring the train to a standstill it is only necessary for the train, in passing, to come in contact with the disc, and give itself its own danger-signal.

THE ST. GOTHARD TUNNEL.—It is expected that the St. Gothard Tunnel will be completed by the end of November. The point now reached on the Airola side is 1,281 metres, that on the Goeschenen side 649 metres from the centre of the mountain; and it is expected that the junction of the two galleries will be made some 300 metres from the centre on its southern side.