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COL. CASEY of the Engineer Corps, Mr. Hill, the Supervising Architect, and Mr. Clark, the Architect of the Capitol, were the Commission appointed by the President after the fire in the Patent Office to inquire into the security of the public buildings against fire (see *American Architect*, No. 93). Their report was submitted to the President, and by him referred to Congress just before the holidays. Of the Capitol, they say that it is mostly of fire-proof construction, but the roof of the old building immediately about the dome is of wood, and the space under it is used for storage of books and documents, the ceiling below being also of wood. A fire in this part of the building might endanger the colonnade of the dome. In the libraries of the Senate and House the galleries, shelves, and cases are of wood. The Treasury, Post Office, and Patent Office are mostly fire-proof; but in the Treasury the file-room over the eastern colonnade has a wooden floor on wooden joists, and all the old part of the roof is sheathed in wood, coppered. All that remains of the roof of the Patent Office and part of that of the Post Office are wooden, and in both buildings are combustible ceilings. In the basement of the Treasury, moreover, are a cabinet-maker's and a carpenter's shops, and store-rooms of inflammable material. The new State Department is of fire-proof material throughout, excepting only the doors, and the boarding of the floors, which is laid in concrete. The War and Navy Departments, the Printing Office, and the buildings in which various bureaus of the War and Treasury Departments are forced to find lodgings for want of room at home, are pretty much all combustible. The buildings of the Naval Observatory are of ordinary construction, with scarcely any protection, "old and too much worn to be susceptible of being remodelled into fire-proof structures." They add that:—

"Generally the public buildings not of fire-proof construction, and used for office purposes, are much endangered by the character of their contents. The files, cases and boxes, books, papers, etc., belonging to the several departments of the Government, have accumulated to such an extent as to crowd the spaces provided for them, and a fire fairly under way would be difficult to control. Workshops of various kinds are also connected with some of the buildings, in which are kept materials of a combustible character, thus contributing to the causes of disaster."

The Commission recommends specific improvements in the various buildings, replacing combustible material by incombustible, the removal of dangerous contents and stores of combustible materials, and the supply of pipes and hydrants where there is need. They advise the building of a fire-proof observatory, and suggest the removal of the Bureau of Engraving and Printing from the Treasury. Of one proposition which has been set before them, they say wisely:—

"The number of papers is increasing rapidly, and in the consideration of the care and preservation of the files this Commission has met with the suggestion that many of the papers could well be destroyed. After a careful examination of this question, we do not consider it advisable to recommend this course with any of the records, however unimportant they may appear. Every paper worthy at any time to be recorded and placed on the public files may be of value at some future time, either in a historical, biographical, or pecuniary way, to

the citizen or the nation. Papers seemingly of the least importance have been connected with the proof of false demands against the Government; and it is scarcely possible to arrive at a decision of what is important to be preserved, and what is useless to be destroyed."

They consequently recommend that a special fire-proof building be put up for the archives of the Government, where all papers that are not needed for frequent reference can be filed away, to the relief of the file-rooms in the departments. By way of general suggestions they say:—

"Very little can be done without further legislation to insure greater security against fire. More stringent police regulations, with adequate apparatus, and the changes herein recommended, will contribute in a measure to this end; but the great danger is to be found in the structural character of the buildings themselves, and the changes necessary to remedy this can only be made after authorization by Congress. In the opinion of the Commission, only fire-proof materials and fire-proof methods of construction should be permitted in important structures now being or hereafter to be built for public use. It is respectfully recommended that Congress be asked to grant the authority to carry out such of the recommendations of this report as may meet the approval of the Executive."

The quarrel between the commissioners of Cook County, Ill., and the common council of the city of Chicago, over the new combined Court House and City Hall, which has for two years past been a fruitful source of comment in these pages, has now assumed a new phase, disgraceful and expensive to that city, but interesting and picturesque to all outside observers. Our readers may remember that after a ludicrous complication of competitions the opposing parties failed to agree upon an architect, and solved the difficulty in an original way by appointing two, one in the interest of each party. Before long the architects themselves fell out, the main point of controversy being the erection of a dome upon the dividing line between the two halves of the building. The county commissioners, who insist upon the adoption of this feature, or as much of it as can be built upon their side of the line, have pressed on their part of the building with haste, and are now making ready for the dome: the city authorities on the other hand have apparently got but little farther than their foundations, but these have been laid upon a different principle, and do not contemplate making a dome, which is stoutly repudiated as an invention of the enemy. The two halves of the building are therefore conceived on totally different plans; and, moreover, the county half is built upon piles with foundations capable of sustaining a load of ten tons to the square foot, while the city half is built without piles and is capable of bearing about one-fifth of that weight. At length a new and inconveniently conscientious member of the Board had the happy thought of asking the county attorney whether the city has a right to construct its portion without the dome provided in the designs of Mr. Egan, the architect of the commissioners. The opinion of this official is by no means conclusive or comforting to the Board, and now a serious dilemma is presented: if the city wins, the county must demolish work which has cost \$70,000; if the county succeeds, a large part of the work already done on the city side will be worse than wasted, the plans of Mr. Tilley, the architect of the city half, must be fundamentally altered, and a very large bill of expenses must inevitably follow. Both parties have passed resolutions declining the appointment of expert committees of investigation, and so the matter stands. If fraud and incapacity must needs have a monument, a half dome would perhaps be as appropriate as any other form unknown to art.

A NEW theory for the cause of the destruction of the Greenfield candy-factory in New York has been suggested, and seems by the newspaper accounts to have found more favor than it deserves. In the loft of the building adjoining on the east, one story higher than the Greenfield building, a large amount of wool was stored,—over three hundred thousand pounds. The buildings were both old and weak, it is said; and that on the other side of the candy-factory, being two stories lower, gave it no lateral support. The theory is that the pressure of the wool upon the Greenfields' party-wall forced their building over sideways, and so threw down its unbuttressed west wall upon its lower neighbor. This strikes

us as a very unreasonable explanation. The explosion, to which there seems to be convincing testimony, might, it is true, have followed the fall instead of occasioning it; but it is difficult to see how the weight of the wool could have had any such effect as is suggested. The wool could not exert the lateral pressure of a fluid, and so if the building yielded to it, this must have been by canting over bodily to one side, like a house of cards. In this case both buildings would have fallen together, which they did not. Moreover the side wall of the Greenfield building must have fallen all at once and let down the floors which it carried; whereas it is in evidence that persons were seen running back and forth in the upper stories for some minutes after the first explosion. This is confirmed by the testimony of Baacke, the machinist, who, after the explosion had thrown out a portion of the west wall, went to the windows on that side and looked out toward Greenwich Street, upon the roofs of the adjoining building.

A LEADING article in the *Architect* of Dec. 15, discussing the question of originality in modern art, asks, in view of the copyism which infects the English art of the day, whether new countries are more successful in original art than old, and — what many people, and Americans especially, are in the habit of asking — whether Americans are developing, or show an aptitude to develop, any new phase of art. Its conclusion is that “neither in painting, in sculpture, nor in architecture and the decorative arts, does America furnish the slightest evidence of being able to strike out a new path.” The *Architect* gives a not very flattering picture of the condition and prospects of art in the United States, which it takes as the best example of what may be expected in art from the new countries of the world. It takes its cue especially from architecture, of which it says what perhaps is true in modern civilization, though certainly not in older times, that it is “after all probably the best of all tests of any thing like public artistic aptitude of a high order;” being apt to lag behind the other arts in appreciation. “Accordingly,” it says, “what we find in America is a good deal of national taste for poetry, and not much less for music, a very moderate knowledge at the best of painting and sculpture, and in respect of architecture a remarkably simple condition of things. There are a goodly number of big buildings, but the grand dome of Washington, like that of St. Petersburg, is built upon a secret skeleton of cast-iron. It is not to be denied that Gothic spires of deal, painted and ‘splashed’ in imitation of granite, or in some other way made to resemble any thing but the true material, are everywhere characteristic monuments. In the great parliament-houses of the several States, the style of design is generally some very showy and feeble rendering of what we call bastard Italian. The country houses, such as they are, can only be designated in fairness as questionable reproductions of the suburban villas of London. Here and there a European-bred native architect, or a European immigrant, can make a creditable copy of a Gothic church. But beyond such efforts no one seems able to venture.” It adds that, “on the whole, American architecture most certainly exhibits in practice, certain endeavors after that originality which we have heard so much called for in theory; but all such endeavors are in effect frantic and undisciplined, and the more they are novel are the less artistic.”

It is not so easy even for an American to find out just what is the condition of American architecture. The country is wide, its cities far apart, and changing very rapidly in aspect. Buildings cannot be carted about for exhibition like pictures and statues; and one must be at some pains, and travel a good many thousands of miles, to get a general view of what its buildings are. For a representative view it is different; and two or three cities looked at with some care might give a pretty fair idea of what our tendency is now. But the question occurs, What is a representative view? If it is an average view, the picture which the *Architect* draws is not very far wrong. Into our average goes a vast amount of work designed by persons who are not architects at all, or by architects whose skill is of the slenderest, and most of it done anywhere from ten to thirty years ago. But if one is to judge the tendency of our architecture, the things to

look at are those that are doing now, the things that are done by men who are in the front rank, and who are moving first in the direction in which the mass are following. Of most of these things there is no record. The illustrated journals, our own included, do not give any adequate idea of them; and travellers cannot be expected to keep up with them. Twenty years ago, or even less, it was probably true that wooden Gothic spires, painted like stone, were characteristic monuments. They are still built more or less by ambitious builders, or architects in country towns; but they are banished from work of any pretension to consideration, and have altogether ceased to be characteristic. Our state-houses, which certainly are nothing to boast of, are all things of the past, except those which are of the future. The truth is, that the last ten years, we might almost say the last half-dozen, have altogether changed the character of our building. A person who was familiar with Chicago or Boston six years ago might be hopelessly lost in them to-day, so far as his recollection would serve him. In Boston he might imagine himself in a different country, but it would be neither England nor France. It is true that there is a great deal of confusion of style, and a considerable lack of style, in our new work. It borrows rather recklessly from all sides, and it is difficult enough to tell to just what it is tending; but it is very far from being mere reproduction of what is done abroad, and the best of it is by no means frantic in its deviations.

On the question of originality, we have said something in another part of this paper: the essential inquiry to any one who cares to judge of the prospects of architecture in the United States is, what progress have we made in the ten or twenty years during which we have been actively building; and nobody who is here to see can deny that the progress is very great, — great enough to make the future hopeful for excellence if not for originality. Our first architects have not the acquirement nor the firmly disciplined power of the first architects of the leading cities of Europe; but they would take good rank anywhere. Our public buildings are far below the European standards; our better churches are, with a very few exceptions, decidedly inferior to the English, and the same may be said, on the whole, of the exterior architecture of our country houses. Our best and most characteristic work has been in domestic and street architecture, for this has been our chief need and so our chief study. The planning of our dwelling-houses, especially of city houses, has been altogether revolutionized in a dozen years. Americans adhere to the English habit of living in separate city houses, and so far as our opportunities allow us to judge — we may be as imperfectly informed as the *Architect* is, or the writer in the *Revue Générale*, about American architecture — the planning of city houses is distinctly less successful and skilful in England than here. As for street architecture, our best is not as good as the French; but we are inclined to think it is as good as the English or the German, and it is not a copy of either of these, though influenced perhaps by all. But these comparisons are fruitless, since absolute excellence, and not relative, is the one important thing. The trouble is, the best is an unduly small part of the whole, and the interval between the best and the ordinary is much more conspicuous than in older countries; but perhaps where there is progress, this interval is a pretty satisfactory index of it.

On the whole, the promise of American architecture seems to us encouraging enough. Whether we are to lead the world into new paths or not, we need not stop to consider: we are certainly not ready for it yet. We have faults enough, — ostentation, self-confidence, impatience of restraint, and thus far little discipline or acquirement; but we have also inventiveness, independence, straightforwardness, and apparently a fair share of native artistic sense. At present, unluckily, consistency is not a part of our plan: until it is, we cannot hope for the best result. No people ever went far in art — or in any other pursuit — except by a united effort in a common direction. Till our architects learn to work together better than they do now, we are not likely to accomplish any thing great; but this is one of the respects in which we are improving. A great drawback to our success is our impatience of criticism, both from each other and from outside.

The strictures of foreigners, even the more dispassionate, have been wont especially to stir us into an unnecessary indignation, that made us blind to what value they might have. So long as we consider it an affront and evidence of personal hostility to point out the faults of our work, we shut ourselves out from one of the surest means of bettering it. It will be well for us when we are able to give and receive correction among ourselves with truth and soberness; and we can always afford to take note of what competent outsiders say of us, and pay heed to whatever of truth we can find in it, without inquiring too curiously into the respectfulness of their attitude or the fulness of their appreciation, which is more their concern than ours.

ORIGINALITY IN AMERICAN ART.

ENTHUSIASTIC friends of the United States have always called upon her to lead the way to a new day in art, and this century had hardly opened before the cry for a national literature and a national art was raised at home; nor has it yet ceased to be heard above the clamor of business and politics. Architecture has been especially singled out as a fitting subject for originality. Long before means were provided for instructing our architects in any kind of design, they were exhorted to attack a difficulty which the best-trained of our day in any country have not yet fully succeeded in mastering. Recipes of Indian corn, and we know not what other decorative material, were showered upon them, and an abundance of abstract ideas, moral, social, and political, thrust forward for concrete expression in architecture by eager laymen. The outcome of these aspirations has not been great, for fortunately architects have been too busy learning their business to pay much heed to them. Whatever has been accomplished in giving an individual character — and a good deal has been done lately in an unambitious way — has been done, as all architectural progress is made, by simply studying to meet the natural exigencies of use and construction as they grew, while the more aspiring efforts that have been made have borne less fruit in improvement.

Without stopping for the moment to discuss the fairness of the account of our architectural condition to which we have alluded elsewhere, we may say with regard to all the expectations or prophecies of, and exhortations concerning, an original art in our new country, of which we have heard so much, that we believe they are all wrong, and for the present not pertinent. We do not believe in the exhibition of infant phenomena, individual or national. A new country is exactly the wrong place to look to for originality in any pursuit which is the fruit of development and special training, most of all in art. New countries are not peopled by artists, nor by men who have the leisure or the means to encourage art; but by men who have their living to get. Their first generations are busy subduing their land and providing for their subsistence. Whatever artistic faculty they inherit lies dormant meanwhile, and deteriorates from disuse; so that when they reach the point where leisure and wealth allow of the serious study of art, they have a long leeway to make up, and recommence at a disadvantage. Art requires continuity of development as much as science, and its development is even slower. The people who have gone aside to colonize a new country must be contented, when they rejoin the moving current of progress in art, to take a place behind that which they left. They have a certain advantage of fresh interest and a starting-point outside of prejudices; but the disadvantage of aptitudes rusty with disuse, broken traditions, paucity of examples in art, and absolute lack of means of training. To count first on originality under such circumstances is unreasonable in outsiders: it is mischievous in the people themselves, for what they need is steady training without temptation to vagaries.

So far as we see, only two kinds of originality are possible in art. One is the originality which begins with no acquirement or habit; develops its own forms and methods in native experimental ways. This is the originality of barbarous art; it is simple, *naïve*, and in the hands of an apt people always has a charm of its own. It is manifestly impossible in any people which has the appliances of civilized life. It has nevertheless been attempted in our day, or something more like it than the practitioners would be willing to confess, in the efforts of doctrinaires and enthusiasts to produce decora-

tion, furniture, and even architecture by the light of nature alone, while yet they cannot divest themselves of the habits they owe to the art of another kind, by which they are always surrounded without having mastered it. The result is the originality of the sophisticated savage, who uses beads for his money, and hangs a pair of boots about his neck for ornament. The other kind of originality, the only kind which is possible or desirable in a high civilization, is that of thoroughly trained artists, whose skill is cumulative, advancing step by step from the mastery of old forms to the development of new. In this case changes of form, though they may be rapid, are never discontinuous. They are not the product of undisciplined effort, but the fruit of men's labor whose power is the accumulation of generations. Such fruit ripens slowly. It took hundreds of years to produce either Greek or Gothic architecture, and that after the chief productive energy of whole peoples had been directed to art. It is true that no civilized people has to start from the very beginning as those did, and that the long work of those centuries was not the invention of forms so much as the education of a community; but this also is a part of our work, and now the greater portion of our energy is turned in other directions.

Moreover, we doubt the value of a search after originality beyond the natural desire to avoid the trite and commonplace, with which the customary is not to be confounded. It is something like the search for happiness: that kind which is found by hunting it for its own sake is not likely to be worth much when it is got. Novelty for the mere sake of novelty — and this is what the cry for originality amounts to — always seems purposeless and therefore feeble. Most of all is this true in architecture, an art in which every great development hitherto has had an obvious and convincing reason. It is an art which embodies so much virility and directness of purpose that motiveless changes of it are an offence. All real originality in it has resulted from modification of the conditions of life, or from the influence of new materials in construction, — joined with the spontaneous action of a national instinct in design, itself a thing of long growth, the result of numberless consenting tendencies, and not to be resisted or changed, unless in extraordinary circumstances, by individual effort. Changes in art which are due to this instinct have the dignity and authority that belong to the steady irreversible movement of a whole people or of an age. In the present time, the adaptation of new materials is undetermined; the conditions of modern life are in a state of flux; general instinct of design there is none; and national instinct for art, at least in a new country, is not likely to take shape till there is some fixity in the other influences. Under these circumstances our changes are only likely to be what they have been through this century in England and America, — mere vacillations of fashion, expressive of nothing, suited for millinery, but unworthy of a serious art whose works are to outlast the lives of men.

To a young nation then, as to a young artist, one may safely say: It is much more important that your art should be good in its kind than that it should be original. Have no fear lest, after you have acquired a mastery of expression, if you have any thing to say, you shall be backward in saying it. Therefore be in no haste for originality, but learn the mastery of expression in art, by learning to control the elements and combinations that are ready to your hand. Discipline your power by working with the material of whose successful use you have examples before you. Then when you have acquired a trained sense and a sure hand, a safe mastery of form, proportion, and combination, if you have time left, and ideas of your own that want expression, devote yourself to being original; or better, to expressing them as straightforwardly as possible, and you will be original enough. If you have not, leave it to your son or your grandson, who, by virtue of his inheritance beginning where you left off, may with equal strength climb to heights which you could not reach. As for America, her artistic activity is a thing of one generation. A generation counts for little in the development of art, — for very little when the whole shaping of a national instinct is involved. No nation ever pursued art with a persistent and thoroughly earnest interest, that did not in the end produce an art original enough, for such an interest is the index of aptitude. We cannot suppose that Americans, if they really show such an interest, will fail of individuality in their art; but there is no need to be in a hurry.

PAPERS ON PERSPECTIVE.

IN compliance with the wishes of my friends and pupils, and in fulfilment of a promise made more than a year ago to the editors of the *American Architect and Building News*, I propose to furnish to its readers, from week to week, a series of papers upon Perspective. A new treatment of so old a theme would be uncalled for, but that even the more elaborate treatises are deficient in comprehensiveness and scientific simplicity, while the practical hand-books fail to make the reader acquainted with methods that are found in experience to be the most convenient and practical of all. Most of what I shall have to say is of course, in substance, an old story; but it is a story which can, I think, be told anew with profit, so as the better to lead up to the chapters that are comparatively new. That I have any thing to offer which is absolutely new, that I have in my explorations found any field absolutely untrodden by my predecessors, I can hardly suppose: I am too used, in these regions, to discover the footprints of unknown or forgotten pioneers in what I had taken to be really *terra incognita*. But I am sure that if the reader will accompany me he will come to some things that, if not absolutely novel, are new to him, and that he will reach some points of view from which the more familiar ground will present an unaccustomed aspect.

This discussion of the subject will differ from that generally given, in several particulars; much greater prominence being assigned to the phenomena of parallel planes than is usual, and use being made of the laws thus established to determine the perspective of shadows,—a subject that seems hitherto to have received but little attention.

In the course of this investigation it will be shown that the horizontal plane hardly deserves the paramount importance commonly assigned to it, and that the practice of referring all constructions to that plane is productive of needless inconvenience. The well-known method, also, of points of distance, or points of measures, which is generally treated as an auxiliary method of but limited serviceability, will be shown to be of universal application, and to suffice for the solution of almost all problems. The development of this method to its legitimate results leads to the construction of a perspective plan, rendering unnecessary the construction of the orthographic plan, by the aid of which perspective drawings are commonly made.

Any treatise on perspective is, of course, mainly directed to meet the wants of the architect; and the problems with which he deals are free from most of the perplexities that constantly annoy the student of nature. But there are difficulties and apparent anomalies which confuse the mind even of the architectural draughtsman, in disposing of which we shall also be able to explain the discrepancies which are always found to exist between sketches made faithfully from nature, and drawings made according to the common perspective rules,—discrepancies which have naturally produced among artists a certain disregard and contempt for the rules themselves. It will be shown, as indeed hardly needs to be pointed out, that in drawing from nature, one works, in fact, not upon a plane, but upon a cylinder. The discussion of Plane Perspective needs to be supplemented, then, by a chapter on Cylindrical, or, as it is sometimes called, Panoramic Perspective, and an explanation of the principles and rules of this method will show its results to be exactly conformable, in kind, to those reached when drawing merely by the eye. Much that I shall have to say will thus be as pertinent to the work of the landscape painter or the historical painter as to that of the architect.

Finally we will briefly review some ingenious methods of limiting the space required for making drawings in perspective, especially that of the late M. Adhémar; methods of the greatest value when, as in fresco-painting or scene-painting, the picture is large compared with the size of the room in which it is to be made. To this I hope to add some historical notes, showing the gradual development of the art, and of the scientific ideas on which it is based.

W. R. W.

I.—THE PHENOMENA OF PERSPECTIVE.

1. A drawing made in perspective undertakes to represent objects of the shape and size that they actually appear from a given point. It has to do only indirectly with their real shape and size, being mainly concerned with their apparent outlines and dimensions. Before trying to learn how to draw them, then, it is obviously desirable to find out how they really look. This first paper will accordingly be taken up with considering the appearances of things, the phenomena with which perspective has to do.

2. The things in question, as always in the scientific study of form, are lines, especially straight lines; plane figures, especially rectangular figures and the circle; and solid objects, especially the sphere and cylinder. The appearance of solids bounded by plane surfaces is determined, of course, by the aspect of the plane figures that bound them.

3. Certain phenomena in regard to the shape and size of these things are sufficiently obvious. It does not need to be pointed out that every thing seems smaller—that is to say, subtends a smaller visual angle—when at a distance from the eye than when near; that consequently the more distant portions of a straight line seem smaller than equal divisions near at hand; that in rectangular figures the farther sides occupy less space to the eye than the

nearer sides, so that they present, in most positions, a trapezoidal rather than a rectangular aspect, the sides inclining towards one another; that a circle when seen in perspective generally appears as an ellipse, and that the centre of the circle does not occupy the centre of the ellipse, but is nearer to the farther than to the hither edge. These qualitative determinations are easy enough. But it is not so easy to determine the relations of quantity, to tell how much smaller a given distance will make a given line appear, or just at what angle the sides of the rectangle seem inclined, and in what direction they seem to run. To determine these things with exactness is the chief object of these methods,—an object to be reached through the study of another class of phenomena, the appearances not of limited and finite lines and planes, but of lines and planes supposed to be indefinitely extended. Indeed, finite lines and planes are in perspective considered merely as portions of the indefinitely extended lines and planes in which they lie.

4. All lines lying in one and the same direction, and consequently parallel to each other, are said to belong to the same system of lines. Each line is an element of the system.

In like manner, all planes parallel to one another, and whose axes accordingly belong to the same system of lines, are said to belong to the same system of planes. Each plane is an element of the system. By the axis of a plane is meant any line at right angles, or perpendicular, to it.

The position of the spectator, that is to say, of the spectator's eye, is called the station point.

Now if we imagine the lines of any system to be indefinitely extended both ways, we shall encounter the following phenomena.

5. All the lines of a system, that is, all lines parallel to each other in space, seem to converge towards two infinitely distant points. These points are called the vanishing points of that system of lines. They are 180° distant from each other.

The vanishing points of a line are the utmost possible limits of its apparent extension, even though infinitely extended. For a straight line, although infinitely long, cannot subtend an arc of more than 180° ; it cannot seem more than a semicircle.

The beams of the sun, or the shadows of clouds, at sunset, which seem to separate overhead and converge near the opposite horizon, afford a capital instance of parallel lines with two vanishing points. So also do parallel lines of cloud, and, in streets, the lines of sidewalks, eaves, and house-tops. They appear as great circles of the sphere of which the eye is the centre.

6. Now what is very curious is that whichever element of the system one looks at seems straight; the others, on both sides, seeming concave towards it. The horizon itself, which seems straight when one looks at it, seems curved if one looks up or down. Other horizontal lines, when regarded with reference to the horizon, seem parallel to it, and farthest removed from it, where they are nearest the eye, approaching it at a constantly increasing angle as they retreat towards their vanishing points.

These singular phenomena, though constantly before our eyes, are little noticed, and consequently but little known. But they sometimes force themselves upon the draughtsman's attention, causing much confusion in his drawing and in his mind. The fact that most straight lines, all indeed except one, always seem curved, is the basis of the method of curvilinear or panoramic perspective, which will form the subject of a subsequent paper.

7. Either vanishing point of any system of lines may be found by looking in the direction followed by the lines of that system; the vanishing point will then be seen full in front of the eye.

That element of the system which passes through the eye, or station point, will be seen *endwise*, the line appearing as a point, coinciding with and covering the vanishing point, which is at its farther extremity.

8. All the planes of a system, that is, all planes parallel to each other in space, seem to converge towards an infinitely distant line, which is the limit of their apparent extension. A plane, though seemingly infinitely extended, like the sea, cannot subtend an arc of more than 180° in every direction; it cannot seem more than a hemisphere. Its limiting line accordingly will be a great circle of the infinite sphere, of which the eye, or station point, is the centre.

9. The vanishing trace of any system of planes may be found by glancing along that plane of the system which passes through the eye. On looking in any direction at right angles to the axis of the system of planes, it is seen full in front of the eye. That element of the system of planes which passes through the eye is seen *edgewise*, the plane appearing as a line, covering and coinciding with the vanishing trace, or horizon, of the system, which is its outer extremity.

Such a line is the horizon, which limits at once the plane of the earth, and the plane, or hemisphere, of the sky. We might call such a line the vanishing line of a system of planes, just as we speak of the vanishing point of a system of lines; but as it is common to call any indefinitely extended right line a vanishing line, it is more convenient to borrow a term from Descriptive Geometry, and speak of the vanishing trace of a system of planes. Or we may borrow another word, and speak of the horizon of a system of planes, distinguishing the real Horizon, or vanishing trace of horizontal planes, by a capital H.

10. Any point or line lying in a line passing through the eye seems exactly to cover and coincide with the vanishing point of the

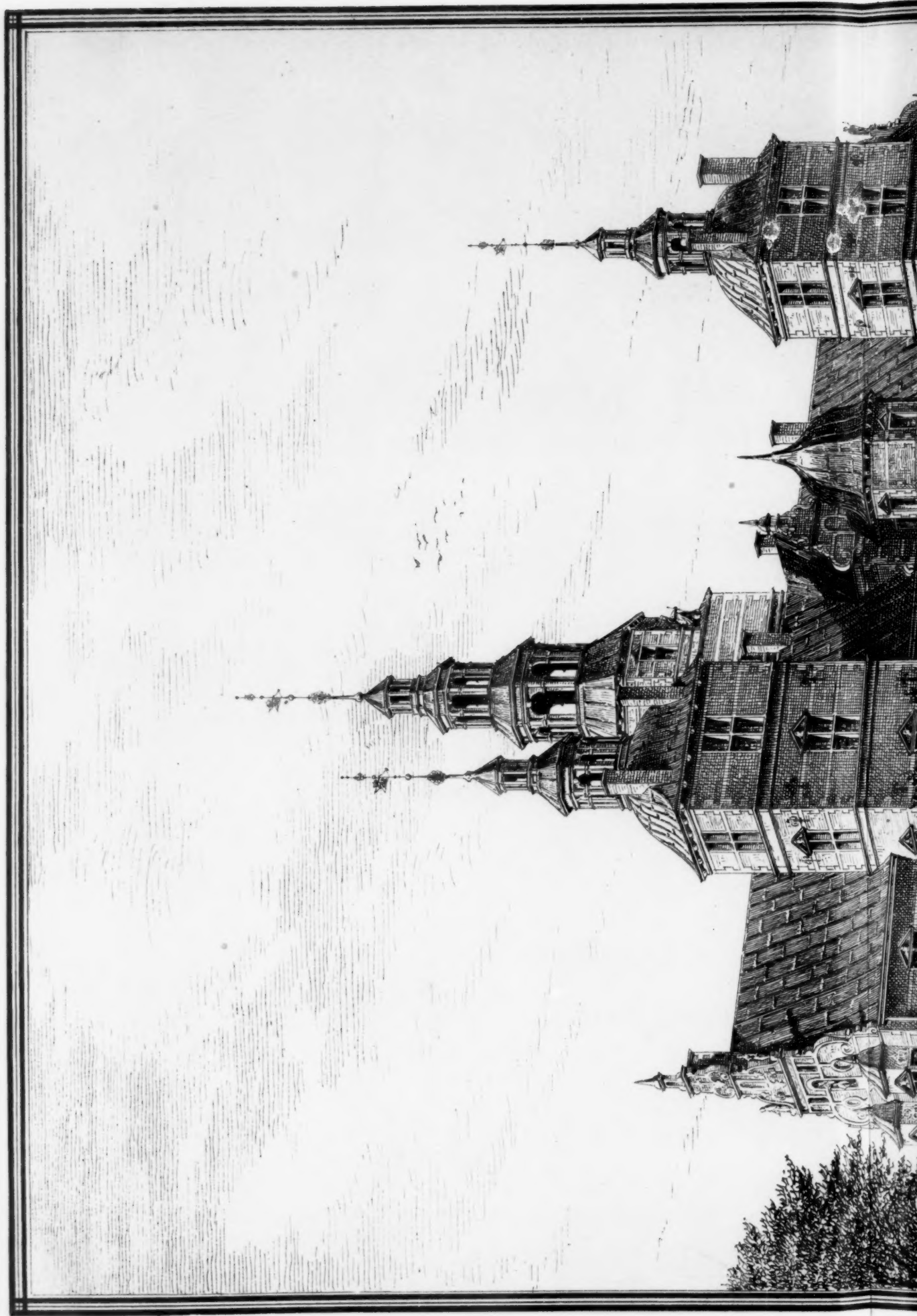


THE BRADDOCK PRINTING CO. 250 NASSAU ST. N.Y.

H. M. Conklin, Archt.

— ST. MARY'S FREE HOSPITAL FOR CHILDREN —

— NEW YORK —



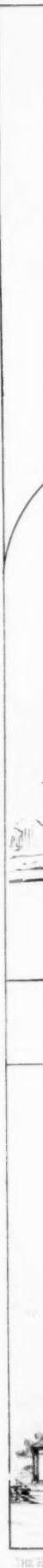


ROSENBOURG CASTLE, COPENHAGEN.



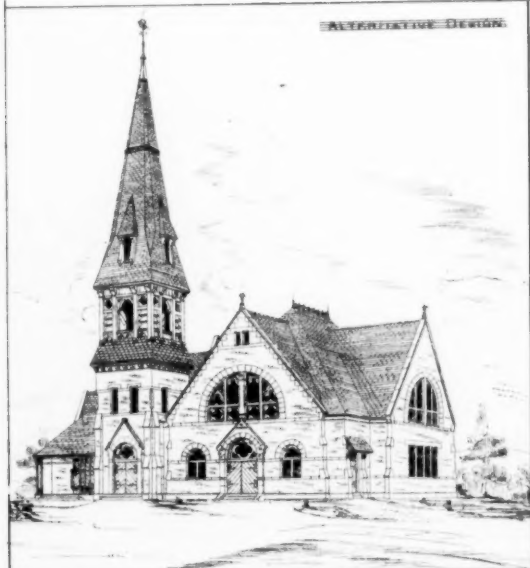
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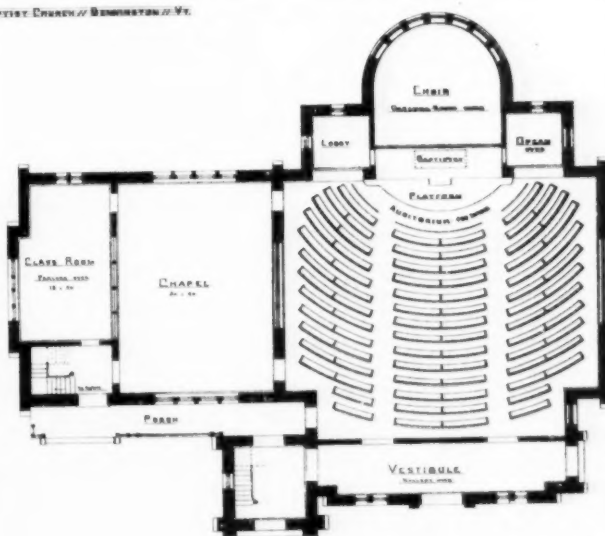


BAPTIST CHURCH AT BENNINGTON VT.
ARTHUR VINAL ARCHT.



ALTERNATIVE DESIGN.

BAPTIST CHURCH AT BENNINGTON VT.



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system to which the line belongs. So also any line, figure, or surface, lying in a plane passing through the eye, appears as a right line, and seems to cover and coincide with a portion of the trace of the system to which the plane belongs.

11. Vanishing points and vanishing traces have to do only with the *direction* of lines and planes, not with their *position*. Hence objects whose lines and planes are parallel have the same vanishing points and traces, whatever their position to the right or to the left, above or below the spectator.

12. A plane surface upon a solid object cannot be seen unless it is on the side of the object towards the trace of that plane.

13. It is obvious that all systems of horizontal lines have their vanishing points in the horizon, and conversely, that the horizon passes through the vanishing points of all systems of horizontal lines. The same is true, of course, of vertical or inclined planes, and the lines that lie in them or are parallel to them. From these considerations we can frame the following propositions, which are the fundamental propositions of our system of perspective.

(a) All lines, or systems of lines, lying in or parallel to a system of planes, have their vanishing points in the trace or horizon of that system.

Conversely:—

The trace, or horizon, of any system of planes passes through the vanishing points of all lines parallel to them.

(b) The traces of all the systems of planes which can be passed through a line, or parallel to it, in any direction, pass through the vanishing point of the system to which the line belongs, and intersect each other at that point.

Conversely:—

A line, or system of lines, lying in or parallel to two planes, has its vanishing point at the intersection of their traces.

Hence:—

(c) The trace of a plane passes through the vanishing points of any two lines lying in it, that is, of any two elements of the plane.

(d) A line lying in a plane has its vanishing point in the trace of that plane.

(e) The line of intersection of two planes has its vanishing point at the intersection of their traces.

14. The reader is recommended to take the pains not only to satisfy himself of the truth of these propositions, which he will easily do, but also to verify them by examples, determining for himself, in his daily walks, at what distant points in the earth or the sky the vanishing points of different lines are to be looked for, lines horizontal, vertical, or inclined; and in like manner to trace the horizons of the different planes he encounters in roofs or walls, exemplifying these propositions over and over again until they become perfectly obvious and familiar.

The vanishing points of the eaves, for example, and of the raking cornice or other steepest line of a roof, are easily found by looking in the directions they pursue. These two directions determine the inclination of the plane of the roof in which they lie. Its trace, or horizon, is a great circle, or straight line, cutting across the sky from one of these vanishing points to the other. In the case of two intersecting roofs, the vanishing point of the hip or valley that marks their intersection is found at the intersection of their horizons.

15. The discussion of a problem in perspective cannot be considered complete until the vanishing point of every line, and the vanishing trace of every plane, has been determined.

THE ILLUSTRATIONS.

ROSENBERG CASTLE, COPENHAGEN, DENMARK.

ROSENBERG CASTLE, of which we give an illustration, is one of the very few buildings of architectural interest, that repeated destructive conflagrations have left in the city of Copenhagen. It was built in the early part of the seventeenth century by King Christian IV., who used it for a summer residence, situated as it was, at the time of erection, only a short distance outside the city walls. A few years later, the fortifications were extended so as to enclose Rosenberg within the city limits, and finally the rapid growth of Copenhagen made it necessary a few years ago to demolish the earthworks, in order to give room for boulevards and streets which made this picturesque building with its surrounding park almost the centre of the Danish capital. The castle was formerly defended by walls, moats, and a draw-bridge, which have partly disappeared to be replaced by the more peaceful flower-gardens and lawns; and only a portion of the moat and the bridge remain to remind one of its fallen greatness. It is evident that the architect of this structure, Steenwinkel, must have been educated in Holland or northern Germany, as all his works, and they are many, bear a strong resemblance to buildings in Amsterdam, Leyden, and Hanover; so much so, that "Dutch Renaissance" has become a generally accepted term in Denmark, for the style of architecture they represent. The castle is built of brick; and the four bay-windows as well as cornices, belts, and window-casings, are made of sandstone. The roofs are all covered with rather wide strips of copper. It is by no means a beautiful architectural creation, but its eccentric gables and numerous carvings in unexpected places do not lack a certain grace, which, together with the time-softened red color of the bricks,

streaked with yellow-tinted sandstone, and the greenish copper roofs which are enlivened by gilt finials and vanes, make a cheerful and pleasing ensemble. The building has not been inhabited for many years, but is used as a depository for many important state documents, and for an invaluable collection of rare gems, gold and silver ware, etc., the property of former members of the royal house. The first story, which is entered through doors hardly three feet wide, by little more than six feet in height, is cut up into a number of small rooms, very cosy and homelike, but hardly what might be expected would satisfy royalty. Some of these rooms are loaded with carvings and paintings, and contain a great many interesting pieces of furniture, made famous by their connection with important events in the history of the kingdom. The second story is also divided up into rather small rooms; one of which is decorated in a peculiar style, the walls, ceiling, and centre of the floor being completely covered with mirrors; and another room is finished in dark wood, highly varnished, and inlaid with a profusion of precious stones and pearls. The third story consists of one large hall, occupying the entire length and width of the main building, with ante-rooms, etc., in the towers. The walls of this hall (Hall of the Knights) are hung with twelve pieces of tapestry, representing battles on land and sea, and other historical events. This tapestry was all made in a small town a few miles from Copenhagen. One end of this vast room is occupied by the royal throne, and the opposite end by the baptismal font, wrought in silver and gold. The whole castle has recently been repaired and restored, and makes a very pleasing feature in a city otherwise poor in interesting architecture.

ST. MARY'S FREE HOSPITAL FOR CHILDREN. MR. HENRY M. CONGDON, ARCHITECT.

This design contemplates the alteration and enlargement of the present building, which is an ordinary city dwelling. An adjoining lot of twenty-five feet width has been purchased for this purpose. Provision is made for three wards containing sixty beds, with an isolation ward in cases of necessity. The basement contains reception ward, dining-room, kitchen, laundry, etc. The first floor: reception-room, office, and sisters' dining-room, with pantries, etc., and one large ward for patients. The second floor provides two large wards for patients, with dining-rooms, ward-closets, etc. The third floor: sisters' bedrooms and infirmary, chapel, nurses' rooms, and store-rooms. The fourth floor: operating-room, isolation ward, servants' dormitory, children's play-room, and house-surgeons' apartments. There are also three good rooms in the attic. A central hall fifteen feet wide on each floor gives access to the different departments; and an elevator communicates with each floor from cellar to attic; while dumb-waiters run from the kitchen floor to the ward dining-rooms. The building is to be heated by steam, and ample provision is made for ventilation. The hospital is in charge of the Sisters of St. Mary. It is hoped that the work will be commenced in the spring of 1878.

BAPTIST CHURCH AT BENNINGTON, VT. MR. ARTHUR VINAL, ARCHITECT.

FIRE-PROOF CONSTRUCTION.

[A paper by Detlef Lienau, F.A.I.A., read at the Eleventh Annual Convention of the American Institute of Architects.]

THE effort to diminish danger by fire to our constructions is one of the greatest importance, and should enlist the energy and all the solicitude of our profession; and even more so in this country, where the difficulties occasioned by the influences of our climate are indeed vastly greater than in the countries of the Old World, from whence we are apt to take our precedents.

The large conflagrations to which many of our cities have lately been exposed have at least taught us this lesson: that the most destructible of our building materials is wood, and the least destructible brick. We should therefore, as much as possible, discard wood, and instead use brick for our principal building material. Among the many suggestions made after our large fires, there has not been mentioned one system of fire-proof vaulting, especially adapted for warehouses and some kind of factories, to which I beg leave to draw your attention for a few moments. This system, which is very common in the North of Germany, where it has existed since the Middle Ages, is well worthy of imitation, not only on account of its easy and practical execution, but also on account of its inexpensiveness. This vaulting consists of a series of strong elliptical arches, built parallel to each other across the building at intervals of say ten to twelve feet from centres: the spandrels of these arches are regularly built up to a level, and serve to support flat segmental arches turned between them. As a general thing the cellars in all buildings (dwelling-houses and others) are arched over in this manner; and in store-houses, breweries, distilleries, etc., you often find four or five stories, one above the other, arched over in the same manner. These buildings are built entirely of brick, and are often finished in this manner to the very roof, for which the arches are laid with the proper inclination, and then covered directly with cement, tile, or metal. With stairs of brick, stone, or iron, and enclosed in brick

wells, and having doors, windows, and shutters of iron, you have a construction as fire-proof as can be made, particularly adapted to storehouses, factories, or to cellars of dwelling-houses, and one not more costly, if as much, as the more modern system of wrought-iron beams filled in with brick arches. A fire from the outside cannot attack such a building vaulted over from cellar to garret, and a fire originating inside of it will in most cases be confined to the story in which it started.

Our system of wrought-iron beams filled in with brick arches, or arches of other fire-proof materials, has some great advantages: not the least one is, that it gives more available room on each floor, and that it requires less thickness of walls than the former system of all brick. But it is not as fire-proof on account of the exposure of the iron to the fire: this danger ought to be overcome.

In order to diminish this danger to the iron beams, a thick coat of plaster of Paris can be stuck to the under side of the beams for protection. For this purpose the arches may be started one-half inch below the lower edge of the beams, and this will give a coat of at least one inch thick the requisite support from and attachment to the arches.

To protect from the heat the end-beams at well-holes, also iron girders composed of two H-beams, and to give them at the same time an inexpensive finish, I have lately used stout hoop-iron ($\frac{3}{8}$ by $\frac{1}{2}$ inch), stretched and bound tightly and riveted around the beams and girders every eight inches from centres; the open channels at the sides of the beams are then filled in and built up with brick laid in cement. The hoop-iron keeps the bricks in their places till the cement has set; afterwards the sides and bottoms are plastered, and mouldings run on them if desired. If the girder-beams are far enough apart to allow the mason to reach with his hands inside, then the cavity between them is filled in with brick likewise. This device gives some considerable protection against heat in case of a fire, and has the advantage of not being costly.

For storehouses, factories, etc., where the danger of fire is greater, a good protection to cast-iron columns and wrought-iron girders might be built by enclosing the columns in brick piers. Suppose an 8" or 12" column: build an 8" wall around it; this would make a pier of 24" or 28" square. To protect the girders, turn, in direction of the same, from pier to pier 8" segmental arches 24" or 28" wide, the extrados of the same to touch the bottom of the girders; then level up the haunches, and build 8" dwarf-walls on each side of the girders to the top of the same. This will give an excellent protection against fire, and where it is most wanted in these kinds of buildings.

In most cases, a 4" instead of an 8" wall would be sufficient; but in extreme cases of storage of inflammable materials the 8" walls and arches would be necessary.

In all our buildings the effort should be to build with fire-proof materials, that is, with stone, brick, iron, and some of the plaster compounds for partitions and furring. Iron beams, which are the most costly of our materials, should be used as sparingly as possible, and we ought to calculate the strength required at every step of our building operation, so that no more iron may enter into our buildings than is absolutely necessary. In order to economize in the right direction, let us use as little wood as possible.

A French architect completes his buildings with less than one-half the amount of wood which we put into ours in the way of finish. The less wood we have in them, the less danger of compromising them in case of fire.

In the matter of roofing, there exists on the Continent of Europe a very safe kind of tile, which might well be adopted here. Not that new fancy tiling that has lately been introduced, and is not good for our purpose. The tile I mean is a plain rectangular tile, with a hook at the top to hook behind a wooden or iron lath, 13 or 16 inches long, 6 or 6½ inches wide, with a thickness of half an inch, which is laid 3 thick in mortar, showing 4 or 5 inches to the weather, and rendered underneath with cement or mortar; in other words, it is laid like slate. This tile roof can be laid at a pitch of three to four inches to the foot, and is not only a great security against fire, but also, when of the proper materials, a very lasting roof. When the sparing use of iron is advocated above, it is for the reason of reducing the cost of the iron construction, and in order to popularize the same. And that this can be done there is no shadow of a doubt. To put the beams as wide apart as their more or less length of bearing requires, would in many cases reduce the weight of iron to a very considerable extent.

The more we do in this direction, the nearer we come to the period when we can expect to have structures which will stand with credit an attack of fire from both the inside and the outside of the building.

CORRESPONDENCE.

THE EXHIBITION BUILDINGS.—THE USE OF ARCHITECTURAL MODELS.

PARIS, Dec. 10, 1877.

It was a fortunate idea for the French to have planned a Universal Exhibition at a time of anticipated political disturbance, as it has served as an anchor to public interests amid the turbulent currents of politics. Although Victor Hugo, in his lately pub-

lished "Histoire d'un Crime," sarcastically recounts how loud on all sides were the protestations of the absurdity and impossibility of a *coup d'état*, even up to the very eve of Napoleon's overthrow of the Republic in '51, still it is incredible, in view of the immense interests in the maintenance of order now at stake, that any party can think of attempting a movement which would render useless the vast works for the Exhibition.

The site of these works is almost ideal; and as the broad plain of the Champ de Mars, accessible on all sides, and covered with vast iron buildings, is appropriate for an exhibition of the world's commercial industries, so the noble stone edifice on the height opposite is most happily consecrated as a temple to the arts; for the Palais du Trocadéro, at first projected as only an accessory to the constructions on the Champ de Mars, is to remain a permanent museum.

A recent visit to these buildings shows every thing so advanced, that there is no doubt that all will be ready by the first of May. The works have been pushed with wonderful rapidity, and are about ready to receive the interior decorations, which are left to the charge of the exhibitors, whether nations or individuals. They have almost finished the giant iron skeletons of the two great vestibules which form the façades towards the Seine and the *École Militaire*, and are placing in position the enormous plaster panels which form the ceiling. A great number of workmen have been for some time past employed in casting these panels, made of plaster with a large proportion of hemp, or some such material, to give them elasticity; for they are extremely thin and light, with no inner frame, and bend under their own weight without cracking. They fit into the iron web of the roof and form cupolas and caissons. It will be remembered, that the vestibules forming the end façades, 1,178 feet long and 82 feet wide, are connected together by, and give access to, nine galleries of exhibition. The largest of these are the two outside ones, forming the side façades, 2,145 feet in length and 115 feet in width, and destined for the machinery, which will be worked by motive-power generated outside the building. Not a spark of fire need therefore enter this gallery. The other galleries are to be devoted to raw materials, goods and furniture. The section of the Fine Arts is placed in the centre, and is interrupted to form a garden in the middle. This gallery, of stone to guard against fire, is isolated; and the avenues on either side will be interesting, for the different countries will decorate their sections upon it by their characteristic architecture. The only one of these façades yet completed is that of England, in brick and stone; and it is so ugly and contemptible, that one would pass it by without comment, did it not pretend to represent the fine old Elizabethan style. The United States is, they say, to be represented by a portable house.

The principal difference between this building and that of 1867 is that the latter was elliptic in form, while the new one, by the same architect, M. Hardy, is rectangular; and though containing some 792,000 square feet, while the building of 1867 contained only 504,900, yet the vestibules have this time been made so much more spacious, and the Art Section three or four times larger, the exhibition space is thus reduced to nearly the same area. The French section comprises one-half the building, and it is perhaps a pity, since as it is divided from the other nations by the Art Gallery and avenues, its exhibitions cannot be so easily compared. The iron construction is the simplest possible, with no attempt at ornamentation, as it will be entirely hidden by the various decorations. The building can have no pretensions to beauty, but its immense size and huge corner pavilions will give it a certain dignity, and then the traditional flags may do something for it.

The park in front, along the Seine, is already laid out with trees, fountains, and grottoes, which are covered with ivy, and contain stalactites cleverly imitated in carbonate of lime, which look as if formed there a century ago, instead of a week.

Crossing the river to the Palais du Trocadéro, the case is different, and architectural criticism can be more exacting. The design is by MM. Davioud and Bourdais, who were supposed to have been chosen in a competition, but who, it is whispered, had no anxiety beforehand about the result; for wire-pulling is as powerful in Paris as anywhere, and M. Davioud is not the man to suffer from the fact.

The building has little resemblance to the design submitted in the competition, for no time was lost in profiting by the clever ideas of the less fortunate competitors. On the whole, the effect is fine of the great central circular theatre, or concert-hall, with lofty towers, and flanked by semicircular porticos, which have a development of some 1,320 feet in length. Nearer approach shows many features, however, open to criticism. M. Davioud has what is commonly called "good taste," and designs charming little details, his capitals and mouldings being generally designed with much delicacy and refinement; but with this will be joined, as in his fountain St. Michel, gross faults of scale and proportion, some of which are here already apparent.

As M. Davioud is the architect of the fountains in Paris, he has allowed himself the luxury of designing something in which he may be supposed to be most at home; and in front of the building is to be an enormous fountain and cascades, to surpass those at St. Cloud and Versailles, and to cost 650,000 francs; the latter fact more probable than the former.

M. Mercié, the first of the modern French sculptors, and author of "Gloria Victis" and the "Génie des Arts" just finished for the entrance to the Louvre, has modelled a winged "Fame" nearly twenty feet high, to be cast in brass, which is to surmount the main building, making this the highest point in Paris. A rough cast from the model is to be placed in position, to allow the sculptor to judge of its effect. The figure itself, they say, is superb in its pose, but to judge it fairly, it must be first raised to its lofty pedestal. So thoroughly understood in France is this desideratum, that no time nor expense are spared to accomplish it. Models in plaster are made of all important details, that the architect may not be misled by his drawings; and this considerable expense is taken as a matter of course. Probably in the United States it would be thought preposterous to permit the delay and expense of raising the model of this statue to the pinnacle of the roof, merely to gratify the whim of a distrustful sculptor. "If he thinks he can't make it right the first time, we will find somebody who can," would be the comment of the committee. But the difficulties of art are better appreciated here. Not long ago M. Vaudremer, architect in charge of the churches of Paris, was intrusted with designing brackets and candelabra for lighting St. Eustache. After the work of several months, a full-sized design was completed; and from this a plaster model costing 1,000 francs was carefully made. On being set up in the church, it appeared too small to the fastidious architect, and it was thrown aside, to be replaced by an equally careful model a little larger; the item of the 1,000 francs for the first model being set down as one of the necessary incidental expenses, without thought of remonstrance from the givers of the candelabra. The whole set are now mounted; and it may appear less surprising to our "happy-go-lucky" architects, that not only in the conscientious labor spent on them, but in their great beauty, they can compare with the best metal-work of the Middle Ages, when one of the greatest sculptors was willing to pass a long life in work upon a pair of doors.

M. Coquart, who a few years ago decorated the interior court of the *École des Beaux-Arts*, was not content with careful studies on a large scale, but for a long time studied their effect when hung upon the walls themselves, in vast sheets of paper. Until we realize in America, that the best art must cost dear in time and money, the highest art cannot flourish among us; but our chief fault is impatience at delays which must occur in the studies of conscientious artists, rather than want of liberality in expense.

R.

THE LATE BUILDING ACCIDENT AT ST. JOHN, N.B.

NEW YORK, Dec. 27, 1877.

TO THE EDITOR OF THE AMERICAN ARCHITECT AND BUILDING NEWS.

Dear Sir, — We have just read the letter of your St. John, N.B., correspondent, and we cannot allow his statement to pass current either with the public or our professional brethren. We send you an account of the accident, and hope that you will correct in your next issue your correspondent's statements.

The buildings on King Street, St. John, N.B., referred to in "Warrington's" letter, were one for Messrs. A. and J. Hay, which had a frontage of 24' 3", with party-wall of brick 12" thick; and adjoining it was one for Judge Skinner, with a frontage 16' 3". The Hay building was built first, and had a 12" wall butting against a 12" wall on the other side from Judge Skinner's. The Hay building was divided into two stores, with a 3' stairway in the centre leading from the front: the stud partition running all the way up, and so dividing it into two buildings. Our arrangement with the Messrs. Hay was to supply plans and specifications, and to superintend only the mason, iron, stone, and granite work, as they had a carpenter in whom they placed complete confidence. The object of this was to reduce our charge for superintendence. It was the first case of partial superintendence we ever had, and the sequel showed its injudiciousness. The senior member of our firm was residing in St. John at the time. He has had twenty-seven years experience as an architect, and this is the first case of a building falling down with which he was in any way connected. As it was, he detected the studs buckling the evening before the accident occurred, and notified the owner and carpenter, who said they would attend to it next day; but it did not wait until next day, and therefore the accident. The case has been investigated, and settled by arbitration, and the following facts have been obtained, which throw the blame where it belonged; i. e., on the carpenter for neglecting to follow the specifications, and on Messrs. Hay for false economy. The specifications called for 3" x 4" studs, but the carpenter put in 2" x 3" studs, and these he set flat-ways. The beams called for were 3" x 9", and these he put in in two lengths, contrary to our instructions, but the owners sustained him in this false economy of material. Now these beams, nine-tenths of which were in two lengths of 12 feet each, all rested on the stud partition in the centre. The rough floor was laid, and the roof only sheathed in; the rain soaked the floors, making the weight too great for the small 2" x 3" studs, which buckled and let down the floor-timbers in the centre, and so thrust out the party-wall between the Hay and Skinner buildings. The beams on Skinner's side, having been put in after this party-wall was run

up, were of course no support to the party-wall from that side. All of these facts were fully demonstrated at the arbitration examination, and the blame settled on the carpenter alone, as he had the entire and sole control of his work; and the expense of rebuilding is put upon the owner and his carpenter.

We solicit your careful perusal of these facts, and trust you will speedily correct the false impression caused by your correspondent's statements.

Very respectfully yours,

WEST AND ANDERSON.

THE AMERICAN INSTITUTE OF ARCHITECTS.

BOARD OF TRUSTEES.

REGULAR monthly meeting Nov. 1, 1877.

The Treasurer called for exact information as to the resolution passed at the late convention, in relation to the formation and duties of a special Committee on Ways and Means. The Secretary read the resolution.

Attention was directed to the fact that the resolution called for said committee to be appointed by the chair, and "to consist of three members, one of whom shall be a member of the Board of Trustees."

The Secretary said that it seemed to him there would be danger of cross-purposes between the Committee on Ways and Means and the Board of Trustees if the Treasurer were not a member of both, and moved that the Board records its opinion that the Treasurer should be a member of the Committee on Ways and Means, and so inform the President. Carried.

The Secretary presented several resolutions passed at the late convention, and referred to the Board of Trustees as follows: —

In relation to Honorary Membership. It was ordered that the resolution be placed in the minutes.

In relation to testing so-called fire-proof material. The Secretary was requested to ask the President for information as to the proper authorities.

In relation to Committees of Examination. The Secretary was instructed to communicate the preambles and resolution to the Chapters that do not yet include a Committee of Examination in their organization, and request them to act on the recommendation of the Convention. The Secretary asked for authority to let authors of documents have them back for verbal revision. The Secretary was authorized to send copies thereof, but not the originals.

Regular quarterly meeting Dec. 6, 1877.

On motion of the Treasurer it was resolved that the Secretary communicate with the Chairman of the Committee on Ways and Means, and inquire what progress has been made toward ascertaining the will of the Chapters in regard to the proposed change in the annual dues, and to call attention to the fact that until a decision by the Chapters is reached in favor of the proposed system of payments, the present system is in force, and will rule in the payments shortly to be demanded.

The Secretary called up the cases of several candidates.

Mr. Upjohn moved that the Board take up the question of Honorary Members who are deriving emolument from the practice of architecture. The Secretary deprecated hasty action on a subject so delicate, and read from the minutes of the Board for Oct. 4, 1877, the resolution of Mr. Upjohn's which had been incorporated into the annual report of the Board, and on which the action of the Convention had been based. The Treasurer also spoke in favor of a calm consideration of the matter, and Mr. Upjohn withdrew his motion.

The Secretary read a letter from Mr. A. J. Bicknell, under date of Oct. 22, 1877, and his answer thereto under date of Nov. 2, 1877, in reference to the exchange and sale of formula for building contracts issued by the Institute, and Mr. Bicknell. The Secretary's letter was accepted as the answer of the Board of Trustees, and the matter was laid on the table.

The Secretary read a letter from Mr. P. B. Wight, under date of Nov. 11, 1877, offering suggestions as to practicable methods for carrying out the resolution of the late Convention in relation to the testing of fire-proof materials and methods.

The Secretary was requested to request Mr. Wight to follow up the subject, and to ask Hon. Abram S. Hewitt to interest himself in it.

NOTES AND CLIPPINGS.

THE WASHINGTON MONUMENT. — Professor Henry and other directors of the Washington National Monument will ask from Congress, after the recess, authority to use a portion of the \$200,000 appropriated last year, in giving greater stability to the foundation if desirable. They still propose to carry up the monument to a height of 485 feet, in accordance with the plan approved by Congress.

ACCIDENT. — As the workmen were finishing one of the brick arches which aid in supporting the approach to the East River Bridge, on York Street, near Fulton Street, Brooklyn, on Saturday, Dec. 22, it fell. All the laborers had sufficient warning to escape, except Neil Mullen, who was buried under ten tons of brick, and instantly killed.

THE OBELISK FOR NEW YORK.—A private letter from Egypt, which has found its way into the *New York Times*, suggests that our congratulations over the prospect of an Alexandrian obelisk in America have been rather premature. No one in the Egyptian capital has heard that the Khedive has made any such gift to this country, though those who have daily access to his Highness would be as apt to learn the news as an English engineer. It seems quite likely that the one hundred thousand dollars required to bring the obelisk to New York will not have to be forthcoming yet awhile.

THE WHITE INCrustation ON BRICKS.—At a meeting of the Philadelphia County Medical Society, held Dec. 26, this subject was reported upon by the Committee on Microscopy, Dr. Jos. G. Richardson, chairman. The committee decided the white deposit to be sulphate of magnesia, better known as Epsom salts. In the deposit, the microscope revealed the presence of epithelial scales from the human skin, and the *débris* of many plants. The sulphuric acid comes from the coal-gas and the coal burned in the city; the base, or magnesia, is from the bricks themselves, a large quantity being found in the clay of which they are made. It is not regarded as in any way injurious, though quite unsightly and destructive to the walls. This coating may be prevented by a thick coat of paint on the wall, or the immersion of the bricks before use in a bath of sulphuric acid, and subsequently to the action of running water.

THE NATIONAL MUSEUM.—It is to be hoped that Congress will shortly appropriate the necessary money for building a National Museum, which shall receive as the nucleus of its collections the articles presented to the Government by the exhibitors in the late Centennial Exhibition, both private and public. These articles, which are worth more than a million dollars, are at present stored in their boxes at the Smithsonian Institute at Washington, and are presumably in danger of deterioration through neglect.

RELICS OF THE LACUSTRINE VILLAGES.—A collection of relics from the lacustrine villages of Switzerland has been secured for exhibition by the Pennsylvania Museum and School of Industrial Art at Philadelphia. Professor Ferdinand Keller made the collection, which consists of charred fragments of woven fabrics, bone implements, needles, scrapers, chisels, awls, and circular perforated disks for weaving, charred fruit, nuts, and grain, bronze implements, spears, knives, razors, sickles, armlets, needles, etc., stone axe-heads set in deer-horn, fragments of pottery rudely ornamented, and numerous unshaped pieces of horn and bone. The specimens are from various localities in the lake region of Switzerland; some from the remarkable village of Robenhäusen, near Lake Pfäfers, in the canton of Zurich, and others from the dwellings of a later period in Lake Neuchâtel.

WHAT A PATERNAL GOVERNMENT SOMETIMES DOES.—Some years ago the Wurtemberg Government erected a number of dwellings for the men employed in its iron-works, and lately has built quite a little town at Stuttgart for the benefit of its employees in the railroad and post-office departments. What led to their erection was the very rapid increase in the rentals and cost of living. The Government leases these buildings, which are admirably designed for comfort and economy, to its employees, who pay a moderate rent. This course was probably found to be much more economical than raising their salaries. In connection with the dwellings are a public kitchen and large baths and wash-houses, and every possible sanitary precaution has been taken.

A MONUMENT TO LIEBIG.—The city of Munich has instituted a competition for a design for a monument to Liebig, and will grant a first prize of the value of \$400, and a second prize of the value of \$300. Models of the monument must not exceed three feet in height, including the pedestal. These models will be transported to Munich free of expense to the competitors. The competition is closed on the fifteenth day of June next.

USING THE ROMAN COLISEUM.—We rather wonder that the idea that has occurred to Mr. Scott Russell, the builder of the Crystal Palace at Sydenham, has never struck anybody else. He proposes to provide Rome with a place for holding an international exhibition which would of itself form one of the chiefest attractions of such a fair. He offers to change the Coliseum into a covered building suitable to exhibition purposes at the comparatively small expense of stretching a velarium over it. Imagine the *coup d'œil* from the topmost range of seats!

THE ITALIANS AT THE COMING EXHIBITION.—It is said that the French architects are much surprised at and pleased by the beauty of the façade which the Italians are building for their compartment in the great exhibition building.

THE WALLS OF ROME.—The removal of the mound of earth and *débris* to the east of the railway station on the Esquiline at Rome has brought to light a fine fragment of the city wall in the time of the Kings. It is to be hoped that some steps will be taken to preserve it, together with the remains of handsome houses, probably of the time of Augustus, which were found built against it. The wall is here over thirty feet high.

THE BEGGARS' BRIDGE AT FLORENCE.—There is a legend in Florence that a Grand Duke once proclaimed that every beggar who would appear in the grand plaza at a certain time should be given a new suit of clothes. The beggars of the city were on hand promptly, when all avenues to the plaza were closed, and each beggar was compelled to strip off his old clothes before receiving the new suit. In the old clothes thus collected, enough money was found secreted to build a bridge over the Arno, which is still called the Beggars' Bridge.

AN OLD ITALIAN BURIED TOWN.—An interesting archaeological discovery has just been made in Italy,—that of a buried town, a new Pompeii, unexpectedly found near Manfredonia, at the foot of Mount Gargano. A temple of Diana was first brought to light; and then a portico about twenty meters in length, with columns without capitals; and finally a necropolis, covering 15,000 square meters (about 3½ acres). A large number of inscriptions have been collected, and some of them have been sent to the museum at Naples. The town discovered is the ancient Sipontum, of which Strabo, Polybeus, and Livy speak, and which was buried by an earthquake. The houses are twenty feet below the surface of the soil. The Italian Government has taken measures to continue the excavations on a large scale. Every day, some fresh object of interest turns up. The latest is a monument erected in honor of Pompey, after his victory over the pirates, and a large quantity of coins in gold and copper.

HOT-WATER IN THE CITY OF PESTH.—The city of Pesth has almost accomplished the task of obtaining an unlimited supply of nearly boiling water, which will be available for public and private use. The ready heated fluid is obtained from a deep artesian well, from which when completed the water will issue in a mighty fountain, to the height of nearly fifty feet. The deepest artesian well in the world has hitherto been that at Paris, which measures 1,794 feet in depth. The Pesth well has already attained a depth of 3,120 feet, and will, when bored the required depth, more than double the depth of its Paris rival. The water now issuing from the bowels of the earth, three-fifths of a mile below the surface, has a temperature of 161° Fahrenheit, and the work will be prosecuted until a warmth of 178° Fahrenheit is obtained. The meaning of these figures will be better understood when it is remembered that the temperature of a hot bath is 98°, while that of boiling water is 212°. The daily supply is already 175,000 gallons,—a quantity which will be greatly increased at the enhanced depth. The work progresses at the rate of 50 feet a month, and recent improvements in the mechanical appliances render possible a still more rapid rate of working. This remarkable undertaking is being carried on partly at the expense of the city, and partly at the expense of the engineers, Messrs. Zsigmondy. — *Building News*.

ULTRAMONTANISM.—At a recent meeting of the Buda-Pesth Society of Architects and Engineers it was discussed "whether architects of other than Roman Catholic religious belief are able to give professional judgment on the plans of Catholic churches." Strange as may seem the proposition of such a question to a scientific body, the decision that they are not is yet more astonishing. The case which gave rise to the discussion was as follows: The architectural section of the society was requested to give a technical opinion on plans submitted for the new church of Telegyhaza. For this purpose jurors were chosen by ballot. It so happened that because of their professional ability, a Protestant and a Jew were elected. Hereupon there was a great outcry from the ultramontanes, which resulted in the resignation of the gentlemen chosen, and the speedy substitution of good Roman Catholics in their place.

GEOLOGICAL FOOTPRINTS.—It is not generally known that the glen at Bellona, Yates County, contains a remarkable curiosity. In the bed of the stream, just above the village of Bellona, is a rock about fifty feet square, uncovered at low water. It is entirely covered with footprints, deep in the rock, of men, and birds, and extinct animals. They are clearly defined as the footprints of the children who had played on the damp bank the morning I visited the glen. Some of these human footprints are very small and delicate; others are large—shockingly large—yet retain their symmetry. The distinctness of these tracks and their relative position preclude any doubt of their character, even to an unscientific observer. I found tracks of some animal in this rock which measure thirty inches in length; I mean distinctive tracks, several times repeated, with such exactness of outline as to identify the species to which the animal belonged. These rocks are a favorite resort of geologists from all parts of the country. The layer of limestone upon the surface of which these footprints appear is about two feet in thickness. Some of the finest specimens have been destroyed by removal of parts of the rock for building purposes—a fate which awaits the remainder. I shall endeavor to procure casts of several of those remaining. It is stated by reliable witnesses that many years ago, while workmen were blasting these rocks to obtain building stone, a perfect petrification of a human head and face of an unknown type was found. The workmen and many others crowded around to examine it, and one of them, impatient at the work being stopped, struck it with his hammer and destroyed it. — *Letter to the Rochester Democrat*.

HYDRAULIC CEMENT.—An excellent cement for foot-walks, and for all uses which require exposure to the weather or to dampness, is described in *Der Practische Maschinen-Constructeur*. It is made by thoroughly stirring Portland cement, or good hydraulic lime, into a warm solution of glue, so as to make a thick paste, and applying it immediately. In three days it acquires extraordinary hardness and tenacity. It is an excellent cement for joining the porcelain heads to the metal spikes which are used as ornamental nails.

CLEANING POLISHED FLOORS.—An oak floor needs only to be rubbed about once a month, with a well-oiled cloth, if in the interim it is rubbed daily with a dry one; but for polished wood that has been neglected, rub in plain linseed oil, and let it dry; and then apply the following on a flannel cloth: shave ¼ lb. of beeswax into an earthenware jar, pour in enough turpentine to cover the wax, and place near the fire till the substance is quite dissolved.

PRIZES.—The attention of our readers is directed to the publishers' announcement regarding subscription prizes, which will be seen on the opposite page.