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THE complaint of the Architects who competed for the Indiana State Capitol against the Commissioners has been dismissed by the Superior Court of the State. The ruling of the judge was clear and decided. He said that the intention of the legislature to make the Commissioners sole judges of all the plans, specifications, and estimates was too distinct to be doubted, and that they were given entire discretion in the matter. With a discretionary power the court had no right to interfere, unless it could be shown that it had been fraudulently used. Of this no charge had been made against the Commissioners, and the only right to revise their action lay in the legislature that had appointed them. In regard to their treatment of the plans submitted, the duty of the committee to examine all the plans, and to cause the experts to do so, was imperative, and the examination was to be thorough and critical. But it had not been charged in the complaint that the plans were not examined; and the right to determine for themselves what was a thorough and critical examination was granted, as a necessary incident, with the power to make it. As for the position of the experts, the court said that the Commissioners were bound to call in their assistance, and to cause them to make a thorough examination of all the plans. They unquestionably did call them, and it was not charged that the experts did not examine the plans. But these experts were not empowered to take part in any judgment upon the plans submitted; they were simply to assist and obey the Commissioners. The complaint, that they were not allowed to test the plans according to their own judgment, was irrelevant, because the Commissioners, being superior to them, were empowered to prescribe their method of examination. With the wisdom of the Commissioners' choice the court had nothing to do. It therefore found no reason in the petition to interfere with the proceedings of the Commissioners; and the motion to quash the complaint was sustained.

THIS decision makes it clear that in the opinion of the court the Commissioners were made by the legislature, and were intended to be, supreme and irresponsible, except in the matter of cost, and of one or two purely formal restrictions. The experts, then, were provided only in order that the Commissioners should have the means of informing themselves technically, and getting a duly qualified opinion of the plans,—if they chose. If they only so much as looked at all the plans, and the experts were allowed to look at them also, they have fulfilled their requirements. Whether this was the actual intention of the legislature or not is of little practical importance in the decision. It is enough that it is the legal interpretation of the act, and very possibly the legislature itself did not inquire into its own meaning so closely as this. It is difficult to see under these circumstances what leg the opposing architects can find to stand on before the courts unless they can get the decision reversed. Their sole resource would seem to be to appeal to the legislature, which alone has power to revise the ac-

tion of the Commissioners, provided it can be got at before the State is irrevocably committed by contract. Nevertheless it is said that the architects have filed an amended complaint which takes its cue from the judge's opinion, and charges that the Commissioners did not order or permit the experts to make a critical examination of the plans. As we understand it, the first complaint entered by Mr. Tebbetts has not, at the time we write, been passed upon.

THE Annual Report of the Boston Inspector of Buildings for 1877 shows a small increase in building over the year before. The number of permits issued was, for buildings of brick, stone, or iron, 265, and for those of wood, 532; the corresponding numbers the year before having been exactly the same for the second, and 200 for the first. The estimated cost of buildings of the two classes finished during the year has been about four and a quarter millions, and one million—against three and a quarter millions and one million and a third in the last report. Very nearly half the buildings in each class are naturally dwellings, while the interruption of work in the business part of the city is indicated by the fact that only twelve are set down as mercantile. The number of cases noted in the fire and accident record is 349, of which practically all but thirty, which are set down as due to a gale of wind, are the results of fire, and the estimated losses are something over one hundred thousand dollars, the whole value of the injured buildings being set at three millions and two thirds, so that the average damage to them was about three per cent of their value. The duties laid upon the inspector and his assistants are not light, as may be seen by reading the memorandum of subjects of which he has jurisdiction that is prefixed to the report. Among the most onerous of them is the examination of buildings with a view to their security. More than twelve thousand such examinations are reported; and detailed reports have been made, it is claimed, on twenty-eight hundred, of which are 36 public halls, 25 public schools, 50 hotels, and 1557 tenement houses. An encouragingly long list is given of alterations that have been made in the various theatres, halls, and churches with a view to the public safety. The report calls attention to one cause which is likely to be a source of some danger in any old and growing city: the fact that, as the business area enlarges, buildings which were first intended for dwellings, and are more or less slightly built, are gradually taken into that area and converted to uses which require greater strength and solidity than those for which they were built, and are therefore liable to become unsafe.

THE project for a ship-canal to divide Cape Cod and shorten the sail from Boston to New York has given Mr. Edmond Redmond, of Rochester, N. Y., an opportunity to bring forward an ingenious project, which we have briefly recorded in one of our late numbers, and whose boldness is startling, even in days so hardened to surprises as ours. He proposes instead of cutting a canal through Cape Cod, or any obstructive strip of land, such as the Isthmus of Panama, to make a portage or carrying-place of it, after the Indian fashion. He would take vessels, of whatever size, out of the water on one side and drag them bodily across the land to launch them on the other again. Since to carry them on a cradle would be difficult and likely to strain the vessels, he proposes to float them in tanks and carry tanks and all by rail. Theoretically, of course a mere film of water would be enough to float a vessel in a receptacle exactly fitted to her shape. Mr. Redmond therefore proposes to adapt his tank as nearly as practicable to the lines of vessels' hulls, so as to float them with a comparatively small additional weight of water. He would make his tank of boiler-iron and run it, mounted on two hundred wheels, over a railroad of several parallel tracks. The track would be carried far enough under water at each end to allow the tank to be submerged like a floating dock, and opened to take in or let out its freight; when the line could not be laid out straight, changes of direction would be made by turn-tables, to avoid the inconvenience of curves. It is hardly safe to say, with the wonders of our day before our eyes, that any mechanical undertaking is impossible, especially when it is merely a question of force and the overcoming of dead weight; but there are some whose difficulty and cost are apparently so out of proportion to their service that we are inclined to quickly dismiss them as impracticable. When we remember the extreme difficulty which Mr. Brunel had a few years ago in

launching the Great Eastern, that is, in moving her empty hull some feet downwards into the water, and then think of Mr. Redmond taking a three thousand ton steamer with all her stores and cargo, or a ship of war and her armament, across Cape Cod, or, as he suggests, the Isthmus, the prospect is not flattering. The only appliance that has yet been found equal to such work is the hydraulic ram; and to drive a vessel up twenty odd miles of steep grade with hydraulic rams is not a task to please the temper of this fast-going generation. We have not seen any estimate of the cost of the tracks and tanks and machinery, nor of the expense of working them. The cost of the Cape Cod Canal, however, has been put down at two million dollars; and one of the United States floating docks, which is a trifle to Mr. Redmond's appliances, has, if we remember rightly, cost a good deal more than this. We fancy, too, that investors who consider how much more expensive it commonly is to transport passengers and freight by rail, even without their ships, than by water, will not be quickly led by hope of profit to embark their capital in a ship-tank railroad.

It is said that the strike of the London stone-masons, which ended a short time ago, after lasting thirty-two weeks, has cost the unions which supported it not less than a hundred and fifty thousand dollars, and has left five hundred of the men out of employment. The cost to the masters of importing and transporting workmen is estimated at fifty thousand dollars. So far as these figures are conclusive, they indicate that the cost of the strike has been three times as great to the men as to the masters; but with them must be included, on the one hand, the difference between what the strikers received from the unions and the wages they would have earned; on the other the loss to the masters by the interruption of their business. When the whole was summed up, if it could be, and personal privation taken into the account, it would undoubtedly be found that the burden was much heavier to the men than to the employers. It has been probably the hardest battle of the kind on record, and has ended in the complete discomfiture of the men, who have gone to work — those that have found work — at the rates against which they struck, ninepence an hour, and with no reduction of hours. The introduction of foreign workmen brought into the struggle a new weapon, against which the men will hardly be able to prevail until they can construct international unions as compact and efficient as the local ones. The density of population in England and the narrow limits of the Island have been points in favor of the men, giving quick communication and the feeling of nearness which goes far to make union easy and effective. Hereafter the success, and possibly even the occurrence, of strikes that are important enough to compel a powerful combination among masters may come to turn on the capability of the men to form secure combinations which shall extend as far as the masters' aims can reach, and that is over the whole civilized world.

THE Committee of the Central Association of Master Builders showed their sense of this aspect of the question in a circular which they issued at the close of the struggle, wherein they urged the importance of retaining and supporting the foreign workmen that had been brought in. They reminded the masters of the boast of the men, that as soon as the strike was over they would oust the new comers. The committee's hope that the result of the war would be to abolish a uniform rate of wages, and promote a perfect freedom of contract between masters and men in the matter of wages, undisturbed by trades-union officers, is perhaps too sanguine; but a great point has been gained, and probably the men will be less aggressive, for a time at least. Nevertheless, it does not appear that the lesson has been greatly taken to heart elsewhere in the kingdom; and we read that the hands in the cotton factories of Lancaster, unmoved by the depression of trade, are preparing a strike on a great scale, in resistance to a reduction of ten per cent. in wages. A meeting of three thousand had been held at Blackburn, at which milder counsels, proposed by their committee, were rejected in favor of an immediate strike. Another meeting on Blakey Moor showed an equally uncompromising temper, and the masters, on their part, were prepared for extreme measures. We read also of a strike in stone quarries at Ballinasloe, in Ireland.

The fact that our Paris correspondent, although writing of the Pavilion of Marsan and the Pavilion of Flora, said nothing

about the central group of the Palace of the Tuileries, caused us to wonder whether anything was doing upon the building in accordance with the report submitted some time ago by the Senate's expert committee, MM. Duc, Viollet-le-Duc, and Reynaud. The gist of this report was a recommendation (see *American Architect* for March 3, 1877) to preserve and restore that portion of the building which is, in spite of the protest of M. Charles Blanc, attributed to Philibert Delorme. A late number of the *Pall Mall Gazette* declared, probably to the regret of a great many interested people, that the proposition to turn the central pavilion into a museum had been rejected, and that the whole building was to be pulled down, throwing the ground on which it stood into the Garden of the Tuileries. We now read in *La Semaine des Constructeurs*, that the Municipal Council of Paris has lately expressed a desire that the whole ruin should be cleared away. This desire may have much or little to do with political sentiment; but it is certain that the Tuileries has always been an obnoxious monument to the radicals of Paris, and it is not unlikely that the mass of republicans, predominating in Paris more than in the rest of France, would look kindly on the destruction of a building which is a perpetual symbol of a cast-off but not forgotten monarchy, and a reminder of an imperialism that still hopes for restoration. With this feeling may concur the irrepressible desire of the Parisians for trimness of aspect, and their preference of a smug newness over the most venerable beauty of an older day. But the proposal to destroy the Tuileries has led the Minister of Public Works to declare his ideas in the matter. They are briefly these: The government has studied the situation, and has decided that it is necessary that a central building should exist between the two flanking pavilions of Flora and Marsan. That as a part of the original palace is standing and in comparatively good order, it will be the most economical course to restore it. As the dimensions of such a building would make it unsuitable for the residence of the President of the Republic or for the bureaux of a minister, therefore the destination of the building is not easy to determine. It has been suggested that it should be used as a library or as an ethnographic museum; and M. Viollet-le-Duc has proposed that it should be converted into a winter-garden. As soon as the government has determined to what use to put it a more definite announcement will be made.

THE QUALIFYING OF ARCHITECTS.¹

THE question of the proper qualifying of architects and of affixing some visible mark to them has come up before the profession and the public several times within a few months past. At the time of the convention of the Institute, last fall, it was brought forward by some of the daily papers as a thing of importance to the public safety. President Walter alluded to it in the Annual Address, and the subject was brought up in the convention and referred to its appropriate committee. At the last meeting of the Boston chapter it was made the special subject of discussion, and a special committee was appointed to consider it; we have ourselves more than once called attention to it. There is every reason why something should be done, and without much longer waiting, to fix in the interest of the public some standard of qualification for architects, and to hold them under a stricter obligation than heretofore to do their work well. The profession is more conspicuous in the United States, and its work more important, than ever before. The great increase of building on a large scale, the development of new methods of construction and of new forms of building to meet new wants, the use of new materials under conditions which require special skill and caution, — all call for greater technical acquirement than used to be necessary. The unhappy failures of many important buildings all over the land have, for the moment, made the public alive to the dangers of trusting their work in unskilled hands; and they ought to be a warning to the general body of architects. These accidents and the feeling which they have called out in the public may give the opportunity for which the more thoughtful part of the profession has long been looking, — of fixing a standard of technical attainment to which whoever will practice as an architect must conform.

Any such attempt may be made with either of two objects, the protection of the profession or the protection of the public. Architects might be protected by forbidding any but architects to do architects' work; the public, by requiring that architects

¹ This article and the one which will follow it are in substance the paper read on the same subject at the last meeting of the Boston Chapter, A. I. A.

should have to do their work well. According as one or the other object predominated, or could be imputed, the movement would wear the aspect of a struggle for privilege, or of an effort for the general welfare. The last aspect would conciliate the support of the public; the other would repel it. The public is jealous of whatever looks like conferring privilege on any class of men, perhaps most of all on any privilege attached to education; so that a measure that looked like the establishment of a monopoly in favor of an educated clique, however useful or reasonable it might be in reality, would be pretty sure of general disfavor.

As a matter of fact it is the interest of the public that is chiefly concerned in making architects what they should be, so far as this can be done; the more, since there will always be quacks and pretenders in every profession, and since even among practitioners of honest intention there is great want of adequate preparation for an architect's work. One fact deserves attention as the peculiar difficulty of our new profession. It is that no standard having ever been fixed in this country for an architect's acquirements the public has no idea of what such a standard should be, and knows no way of determining either whether an architect is what he ought to be, or whether he attempts to be what he ought to be. To do this with certainty by the application of any formula would of course be impracticable. No such criterion as could be established would absolutely meet the difficulty; but if there were a way of fixing a degree of acquirement at which every architect must aim, to be accepted at all, and a preparation which he must at least go through, this would at once rule out the most incapable class, and while the average attainment of the profession was raised, one difficulty of the community would be removed. It is first of all for the general welfare that this is necessary, for it is the money of the community that is wasted and its lives that are endangered, when architects plan bad buildings. It is therefore also important that whatever discrimination can be established should be one that is visible to the public and easy for it to recognize.

Now, in order that an effort to regulate by any formal restrictions the character of our profession should succeed, it needs also the enforcement not of the profession alone, if this could be secured, but of the public. We say if that could be secured, for it is likely that an attempt to establish a distinct qualification for architects would be received quite as coldly by a good many of the profession as by the public: partly because of the indifference of many of them to all concerted action for common interests; partly because there are probably many who, although any restrictions must necessarily be drawn so as to leave undisturbed any who were already in practice, would know by instinct that such restrictions, to have any value, must be a reproach to their own pretensions. These would find it difficult to give a presentable reason for opposing any outside pressure to lift the standard of their profession; but they might feel that in lending their hands to such an attempt on the part of architects they were really writing their own obituaries. It is pretty certain, on the other hand, that unless the people at large saw a reason in their own interest for upholding the restrictions, or at least found them buttressed by the authority of the community rather than by that of the profession, they would simply disregard them, and so make them of no effect. They would employ whomever they pleased, as they do now, without concerning themselves about professional restrictions; the pretenders and the independent practitioners who did not care for professional union would flourish, as they do now, and would snap their fingers at their more orderly brethren. It would probably be altogether ineffective for any body of architects to say, "We will not consider a man an architect, or admit him to our communion, unless he comes prepared within certain requirements." It would require, moreover, a firmness of organization of which, we are sorry to say, we do not believe our profession capable at present.

But if the public can be got to see that it is their own interest — which it is, even more than it is that of the profession — to insist that architects shall not go to work building for them without having learned how, or if this order is enforced upon architects in the name of the public and by the public authority, people will recognize the restriction and be bound by it. To a legal discrimination even quacks must bow, and at least submit to be visibly marked by it, which is all, probably, that we can ask. This is the defence of the other professions, such as are defended, and is the security for itself which the public provides against them. It is the law in most States, we believe, that a

man cannot announce himself as a physician and legally collect a fee unless he has an accredited medical diploma. The practice of the law is guarded by the bar itself; but the bar acts in this through the courts, and the courts are the creation of the public, the authority to which the public itself bows, and which executes the law in the case of the other professions. In other countries where there are any qualifying restrictions upon architects, these are the restrictions of the state, and not of the profession.

All the arguments, then, seem to show that the only authority that can be relied on to maintain any standard of admission to the profession is that of the state; and it is to the authority of the state that the appeal should be made if anything is to be accomplished. But an appeal to state authority can be made only on the ground of the public welfare. In most cases where architects have appealed to the public heretofore it has been in their own behalf, to resist encroachment, or to establish some disputed right, or to acquire prerogative. The American Institute of Architects has done a good deal for the profession in various ways, but has had to do it in the face of the distrust that naturally meets such efforts. Architects have had to stand in the unpopular attitude of persons engaged in a struggle for their own advancement; and what they have accomplished has been at the cost of self-seeking. It is very desirable, then, in so important and conspicuous a matter as this, to do nothing which can repel support by suggesting a spirit of trades-unionism, but to make an effort only on the obvious ground of the general good, and not of professional advantage. For this reason it is necessary to be content with those things which can be clearly shown to be for the advantage of the public, and which the public can appreciate. What the things are which in this view might be reasonably insisted on, and by what tests they could be discriminated, are difficult questions, which would lead us a good way, and of which we must leave the consideration for another article.

PAPERS ON PERSPECTIVE.

VII. — PARALLEL PERSPECTIVE. — CHANGE OF SCALE.

THE last paper discussed the case in which the plane of the picture, and consequently the plane of measures parallel to it, is set at an angle of 45° with the sides of the object, so that the "vanishing point of 45° ," V^x , coincided with C , the centre of the picture, and the principal vanishing points of the right hand and left hand lines, V^u and V^l , and their points of distance, D^u and D^l , are symmetrically disposed on each side of it. The other diagonal, at right angles to X , is in this case of course parallel to the picture, and to the Horizon.

126. Let us now consider the analogous case in which the plane of the picture, and consequently the plane of measures, is taken parallel to one of the principal sets of lines, and at right angles to the other. This is illustrated in Plate VI. When objects are thus represented with one side parallel to the picture and the adjacent sides perpendicular to it, they are said to be drawn in Parallel Perspective.

127. The relation between this case and that discussed in the last paper is shown in the two buildings upon the quay on the left hand side of Fig. 20. The nearest one, whose roof rises just above the rail of the descending steps, stands at 45° with the picture, just as in Plate V, having the vanishing points of its main lines at V^u and V^l ; while one set of its diagonals, X , as seen in the perspective plan, below, converges at $C = V^x$, and the other is parallel to the Horizon: the lines of the hips, P and P' , being directed to V^r and V^s , and the hips Q and Q' being parallel to the traces TRN and TLM (105). The points V^u and V^l are off the picture, but V^r suffices to determine the position of these traces. They are not shown in the picture, to avoid confusion.

128. The larger building beyond, like all the other objects in the picture, is drawn in Parallel Perspective. It is set at an angle of forty-five degrees with the building just mentioned, the sides of one being parallel to the diagonal lines that divide the angles of the other, and *vice versa*. This is rendered more obvious by comparing their perspective plans.

129. These plans, it will be noticed, are drawn wherever it is most convenient to put them, that of the further building being taken so very far below the ground as to come lower down on the paper than that of the nearer building.

130. Now it is to be observed that while the planes of the nearer roofs, as in the previous plates, have for their traces the lines TRN , TLM , etc., and the hips have their vanishing points at V^r , V^s , etc., the roof of the further building, and the tops of the posts in the foreground, which for convenience are given the same slope, present a new case, which we have not hitherto met, the case of inclined planes whose horizontal element is either parallel or perpendicular to the picture.

131. The several flights of steps also, ascend and descend along inclined planes either at right angles to the picture, or, as is the case of those at either end of the platform in the extreme foreground,

parallel with it. Let us take these flights of steps first, and make the rise of each step six inches and the tread nineteen inches. Now as the flights in the fore-ground are parallel to the picture they will be drawn in their true proportions and will give the true slope of the steps; and if we suppose the plane of measures to coincide with the front of the little pavilion, or with the further end of the steps, we can lay off the steps by scale at once, and ascertain their true slope. It proves to be about 20° .

132. To ascertain the point V_1 , which determines the direction of the sloping lines of the flights which ascend at right angles to the picture, we have only to draw a line at $V^x = D^x$, making an angle of 20° with the Horizon. Its point of intersection with $T P P'$, above V^x , will be the point in question, (88). V_1' , the vanishing point of the descending flights, will be at an equal distance below V^x .

133. The traces of the inclined planes in which these steps lie, pass of course through the vanishing points of all the lines that lie in them. V_1 and V_1' are the vanishing points of the steepest lines of the ascending and descending planes, their horizontal elements being parallel to the picture, and having their vanishing points at an infinite distance to the right and left. The traces drawn through V_1 and V_1' are accordingly drawn horizontal, or parallel to the Horizon. The trace of a plane is indeed always parallel to that element of the plane which is parallel to the plane of the picture. For distinction's sake we have lettered these two horizons H_1 and H_1' , just as the Horizon is lettered H .

134. The trace of the inclined planes of the flights of steps that ascend to the right and go down to the left, on the edges of the picture, passes of course through the point C , the vanishing point of their horizontal element, and is parallel to the steepest line of the slope, which is the element parallel to the picture. This trace is not shown.

135. The traces of the inclined planes of the roof of the building on the left and of the little flat pyramids on top of the posts, are determined in the same way. The slope of these planes is about 25° ; they are accordingly steeper than the slope of the steps, and the vanishing points V_2 and V_2' , found by drawing lines from V^x or V^x at an angle of 25° , are further from the Horizon than V_1 and V_1' . H_2 and H_2' are the traces of the front and back planes, while the planes of the right hand and left hand sides pass diagonally across the picture through C at an angle of 25° . They are lettered $T M_2 N_2'$ and $T N_2 M_2'$. The vanishing points of the hips, or angles of the pyramids, are at the intersections of these traces with H_2 and H_2' , at the points marked $M_2 N_2 M_2'$ and N_2' . They are of course in the traces $T L Z$ and $T R Z$, since these hips and angles obviously lie in vertical planes making 45° with the picture.

136. The only other object in the figure, the pavilion or belvedere, a little building just twice as long within as it is wide, is easily drawn. All the lines of the perspective plan are either parallel to the Horizon or converge to C , which is V^x , and are cut off at the length required by setting off the true length by scale, gl , and transferring it to the perspective line by a line drawn to the point of distance $V^x = D^x$. The intermediate points are determined in the same way. The front of the building being in the plane of measures, all its parts are drawn to scale, proportionally to their real dimensions, and the same is true of the further end of the building and of the arched wall in the middle, only that being more distant the scale on which they are drawn is smaller. All the arches are struck from the perspective of their centres, which, being in reality all on a horizontal line perpendicular to the picture, occur in the perspective on a line drawn from the centre of the front arch to C . Their exact position on that line is determined on the perspective plan.

In the same way the rafters in the roof may be laid off exactly, two feet apart, using the point of distance $D^x = X V^x$ or, if their number is known, the space they occupy may be divided into six equal parts by using the method of triangles, described in the fourth of these papers.

137. For the length indicated in the figure, and with the station point so near the picture, there is no practical inconvenience in thus using V^x or V^x as points of distance. But if, as might easily be, the room to be drawn were twice as long as this, the point g would be inconveniently far away, and if the station point were further from the picture — and it is always an object to have the station point as far away as the point from which the picture will generally be regarded — say two feet, the point V^x also would be practically inaccessible.

138. These inconveniences, which are likely to occur in oblique perspective as well as in parallel perspective, may in all cases be got over by substituting another triangle for the isosceles triangle hitherto employed. Instead of using a triangle whose legs are equal we may equally well employ a scalene triangle, provided only the ratio of the two legs is known. Lines drawn parallel to the base will not now indeed divide the adjacent sides into equal parts, but we can just as easily as before cut off any required dimensions.

139. This is illustrated in Fig. 21, *c*. We have here as in Fig. 12 and Fig. 14 the plane of the picture $p p$ in immediate contact with the object, which is here the model of a small room or passage, whose plan, as above, occupies two squares. Let us suppose the spectator to be at S_1 at a distance from the picture of $S_1 C$, the length of the Axis X . V^x then, or D^x , will be at an equal distance

to the right, as shown, on the prolongation of $p p$. This gives the right angled isosceles triangle $S_1 C D^x$, and the length of the room laid off on $p p$ in the other direction may be transferred to the opposite side of the room by lines drawn parallel to $S_1 D^x$. Fig. 21, *b*, shows this done in perspective, determining the point g , as just now in Fig. 20.

140. But this point g will be fixed with equal precision if we take instead of D^x another point D_1 half way from C to D^x and make the base of our triangle $S_1 D_1$. The triangle is no longer isosceles but we know that lines drawn parallel to the base will make the segments of the short side just half as long as those of the long side, and that does just as well. For if we now lay off in the other direction, just as before, half the length desired, a line drawn parallel to $S_1 D_1$ will give g , just as before. And in like manner we might take D_1 , halfway between C and D_1 , and lay off one quarter the required length of the room, etc., with the same result.

141. Applying this now to Fig. 20, by taking D_1 or D_1 , measured off along the Horizon from V^x at half or quarter the distance of the station point from that vanishing point, we can cut off any desired dimensions on the perspective lines that converge at V^x by laying them off upon the ground line, gl , by a scale of equal parts half or quarter as large as those used in the plane of measures, and employed for the horizontal and vertical lines in that plane. Instead of using a half inch scale, and using D^x as the point of distance, we may use a quarter inch scale and transfer the dimensions to X by means of D_1 , or an eighth scale and use D_1 .

142. These results may be summed up as follows: —

Auxiliary points of distance, which may be called points of half-distance, quarter-distance, etc., may be obtained by laying off from the vanishing point of any line, upon any horizon or trace passing through that vanishing point, a half, or a quarter, etc., of the real distance of the station point from that vanishing point; the required dimension must then be laid off in an opposite direction upon a line of half or quarter measures, etc., drawn parallel to that trace through the point where the perspective line in question touches the plane of measures, the scale employed being a scale of equal parts, half, or quarter, as large, etc., as those employed for lines in the plane of measures.

143. It is sometimes convenient also to use a smaller scale for lines parallel to the plane of measures and at some distance behind it, whether vertical, horizontal, or inclined. This is tantamount to establishing another plane of measures, and another ground line, two, three or four times as far off, and diminishing the scale used in the picture accordingly.

144. This use of points of half-distance, third-distance, or quarter-distance, and this employment of an auxiliary plane of measures, and the change of scale involved in both these devices, are obviously just as practicable in other cases as they are in this. But they are most often used in the case of parallel perspective. For in oblique perspective the need of having the vanishing points within convenient distance generally limits the distance of the station point and keeps the points of distance near at hand. Both are always nearer than the remoter vanishing point. But in parallel perspective one of the principal vanishing points is at an infinite distance, and the points of distance, though nearer than that, may yet be quite out of reach. The use of points of half and quarter distance, etc., enables one to set the station point as far away as he pleases. There is absolutely nothing to prevent his taking the point of view most favorable for his purpose, the point of view, namely, that will give the best proportions to his picture.

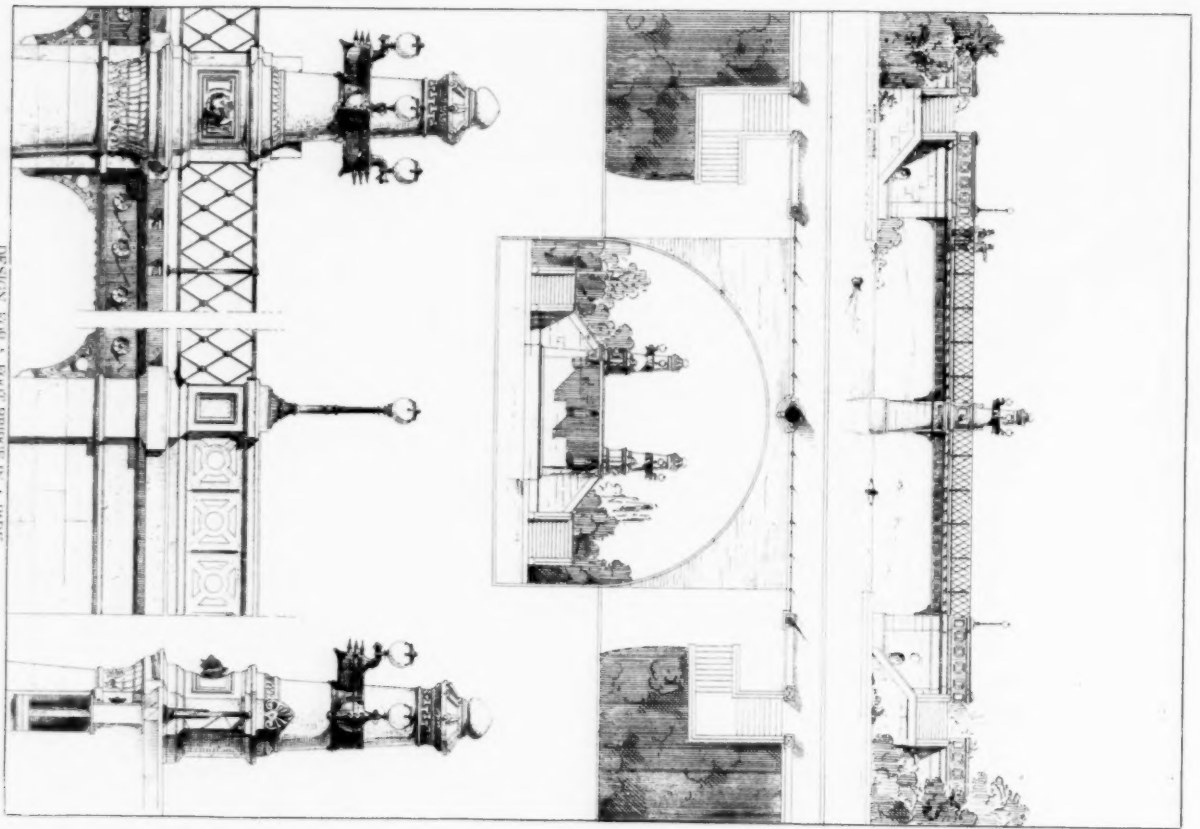
145. In practice it is most convenient to assume the desired proportions at the outset; that is to say, having determined on the scale at which the nearest end of the street or room is to be drawn to make the further end as large, and to set it as far on one side and as far up or down as will look best. Vanishing lines drawn through the corresponding points of the two ends will then determine the centre, C , and the Horizon. This is all that need be determined, since the length of the room or street is supposed to be known of from the near end of the perspective of this length, the real length is laid off upon the ground line, at any convenient scale, and the last point connected with the further end of the perspective line and prolonged until it meets the Horizon, the point thus ascertained will be a point of half, quarter, or third distance, according as the scale chosen is a half, a quarter, or a third of that used in the plane of measures. The corresponding distance of the station point in front of the centre, C , will then be two, three, or four times the distance of the centre from this auxiliary distance point.

The two views of the street in Fig. 22, both of which were drawn in this way, illustrate the importance of carefully proportioning the parts of the picture. The upper shows the street as it would appear quite near at hand, much reduced. The other reduced to the same scale shows how it would look at a greater distance.

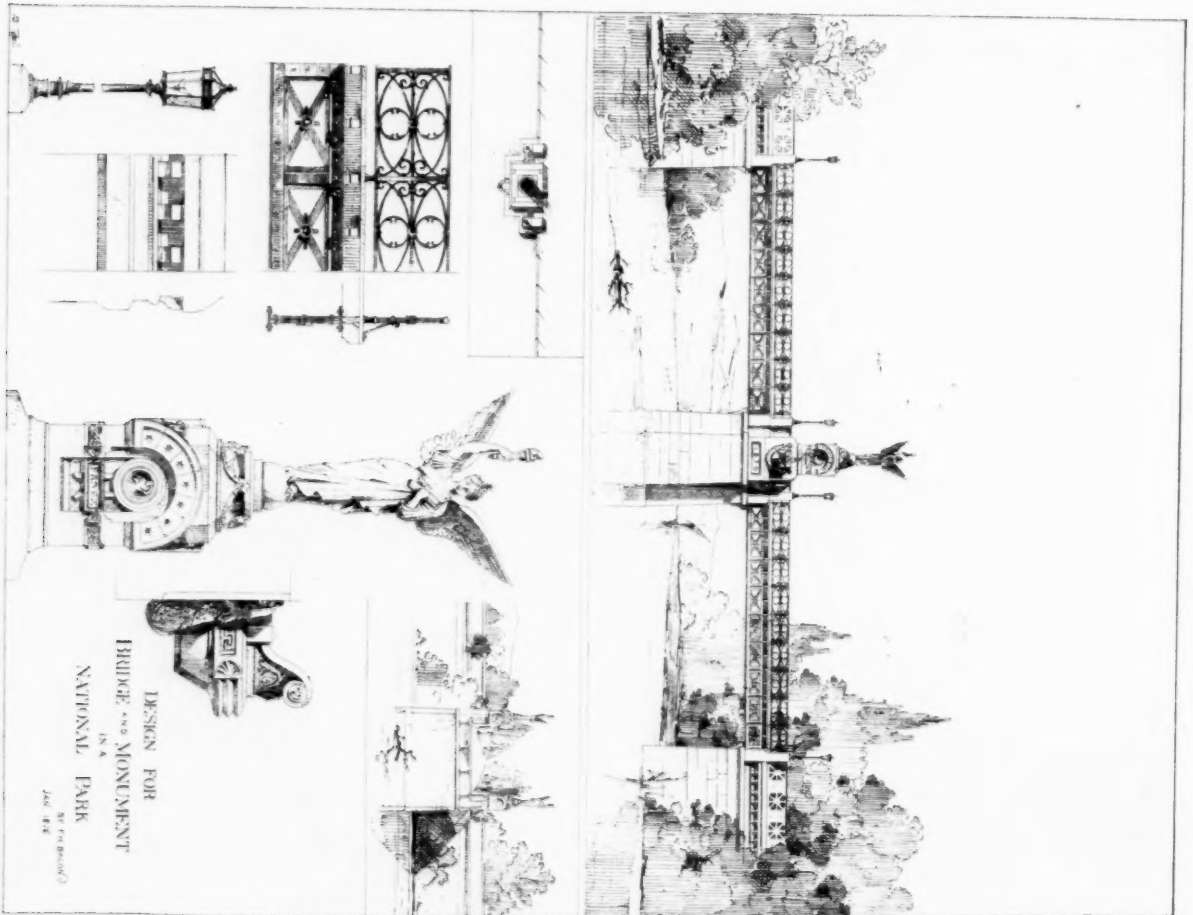
146. Inasmuch as the relative size to be given to the two ends of a room, drawn in parallel perspective, or to the two ends of a street, depends thus entirely on the position of the spectator and not at all on the real length of the side, it follows that a long room seen from one point may be drawn to look just like a short room seen from a nearer point, and that there is no knowing which is which. This is illustrated in Fig. 21, where half the room in the upper figure, a , as seen from S_2 is just the shape of the whole room in the lower



THE ENGRAVING PRINTED BY E. L. DEAN, 100 N. 3RD ST. N.Y.



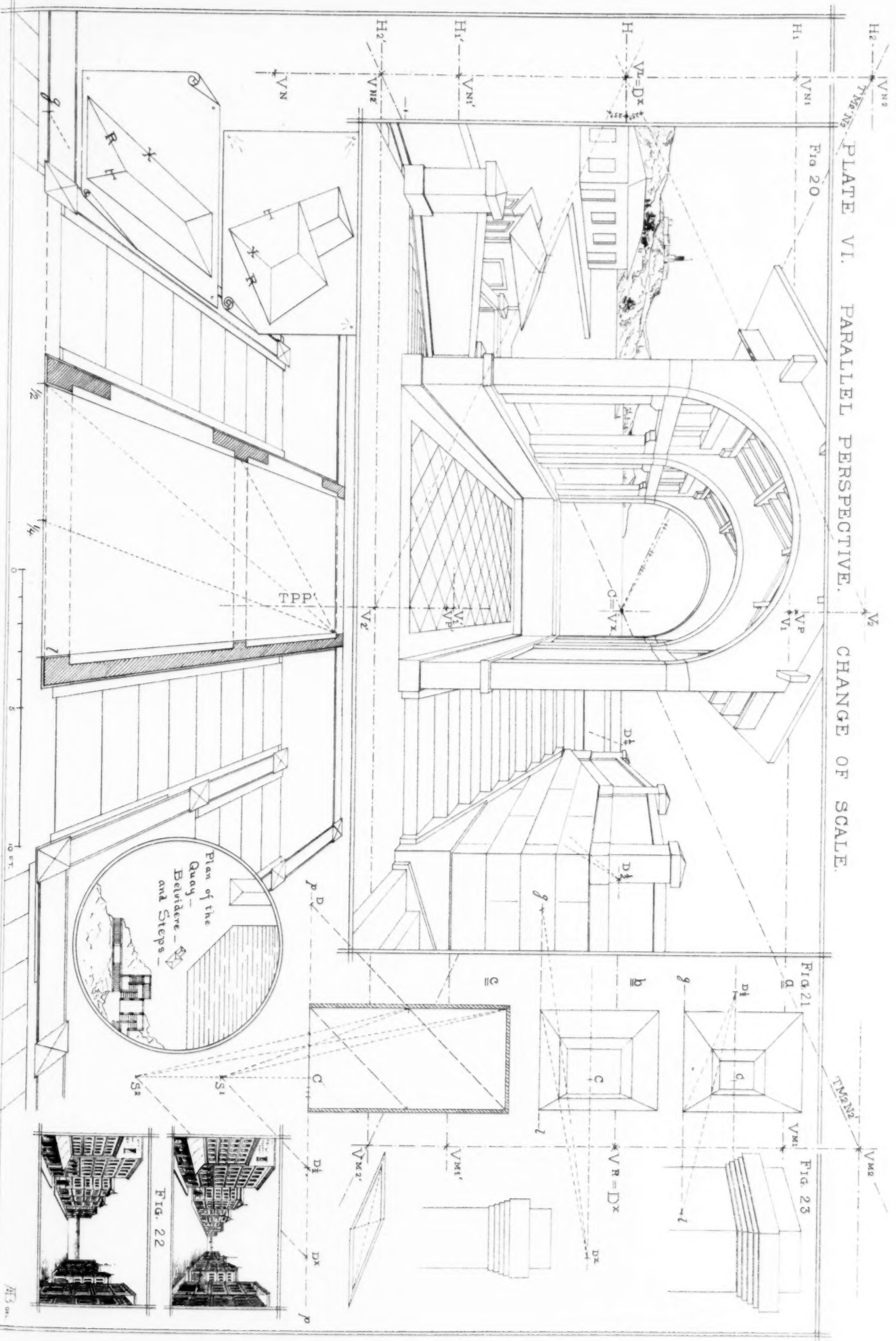
DESIGN FOR A FOOT BRIDGE IN A PARK.
BY HENRI MOORE.

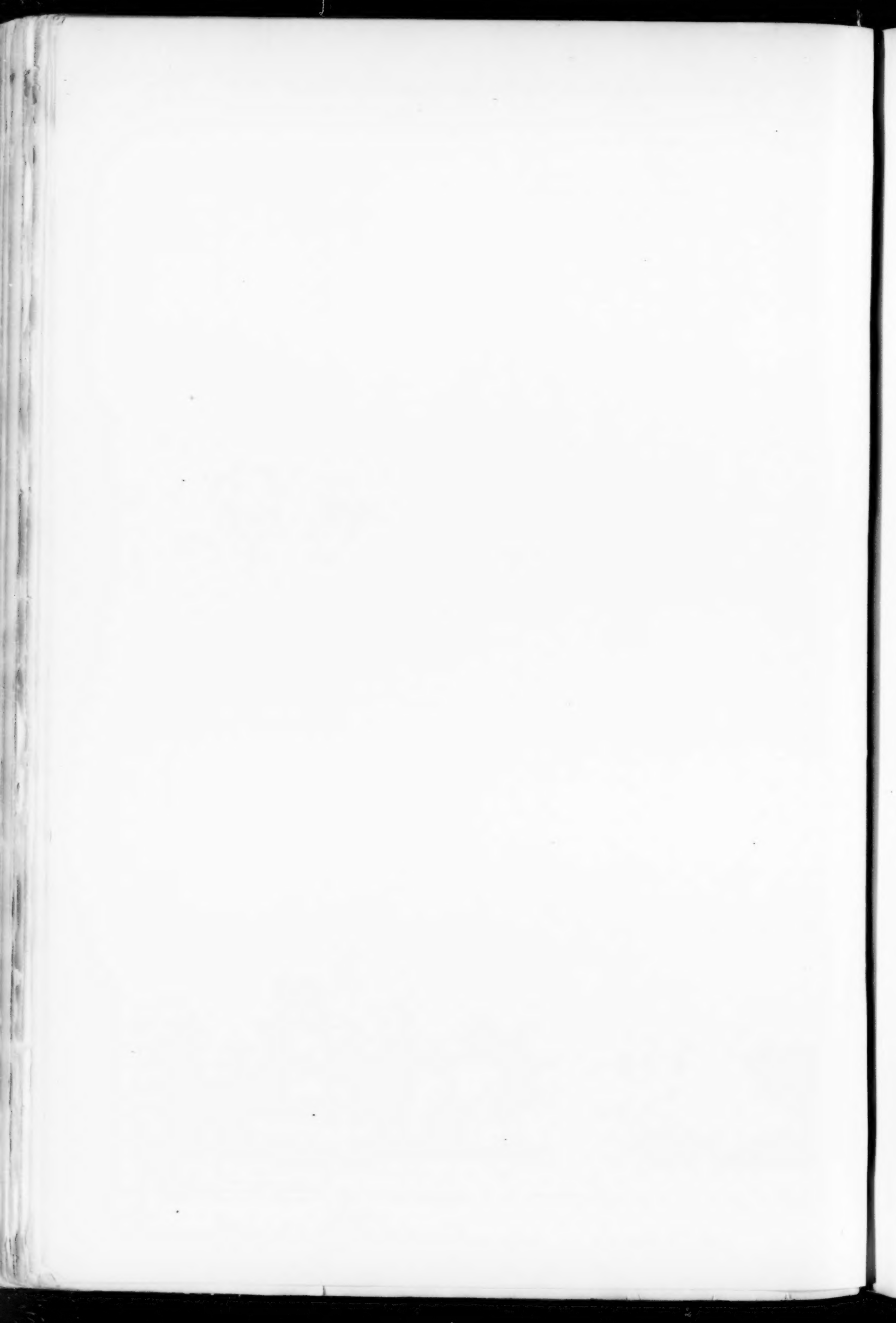


DESIGN FOR
BRIDGE AND MONUMENT
IN A
NATIONAL PARK
BY HENRI MOORE

THE BRIDGE AND MONUMENT IN A NATIONAL PARK.

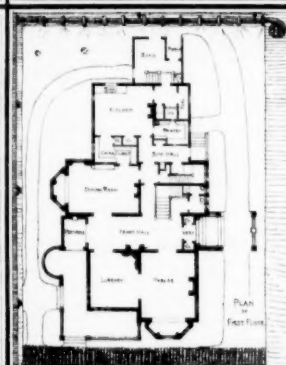
PLATE VI. PARALLEL PERSPECTIVE. CHANGE OF SCALE.







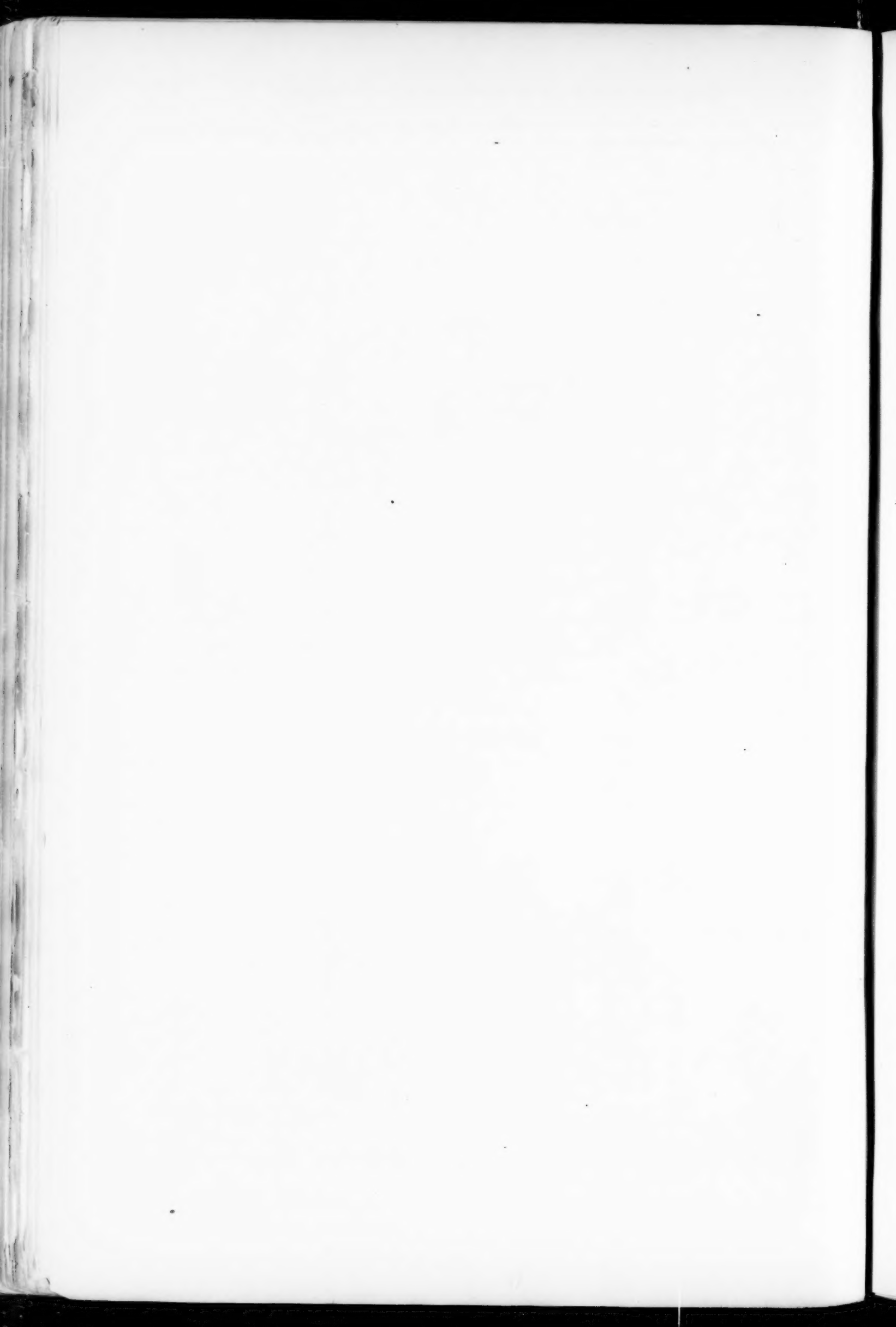
Design for a Country House A.E. Barlow Architect



HARTWELL & TILDEN ARCHITECTS

PROPOSED HOUSE FOR BINGHAMTON N.Y.

*** BOSTON MASS ***



figure, *b*, as seen from *S*. The same drawing also, if regarded from different distances, may give the impression of a long street or room or of a short one.

147. In sketching interiors on the spot the point of view is generally excessively near. Such sketches, being viewed from a greater distance, generally give too great an impression of length, and often have to be redrawn, so as to show the room as it would look from a point which really is outside of it.

148. Parallel perspective is not often used for a single object, inasmuch as in order to show a second side, at right angles to the picture, it is necessary to set it a good way from the centre. Fig. 23 shows the top of a chimney, the end of which is parallel to the picture, while the long side is perpendicular to it. The horizontal lines of the brick-work on this side are directed to *C*, those on the end are parallel to the Horizon, while the vanishing lines of 45° , as seen on the perspective plan below, are directed to V^L and V^R .

149. It is to be noticed that all the surfaces on the end of the chimney are drawn of their true shape and proportion, as if seen in elevation. Still the whole end of the chimney is not drawn in elevation, the relations of the several parts being changed and the symmetry of the whole disturbed, since the nearer surfaces are set further to the right and higher up, and since something is seen of the horizontal surfaces that separate them which in the elevation just below, drawn in orthographic projection, are not seen at all. The chimney certainly looks very ill drawn, and it is not easy even by keeping the eye sedulously at the station point, opposite *C*, to make it look quite right.

150. The use of parallel perspective is accordingly pretty much confined to cases where two objects are to be shown, one on the right and one on the left, as in street views, or interiors. In these cases the eye naturally takes a central position, opposite the middle of the street or the middle of the room represented. It is not necessary of course that the Axis should be exactly in the middle, and it is generally taken near one side, so as to show as much as possible of the other, and thus prevent an absolute symmetry.

THE ILLUSTRATIONS.

THE NASSAU HOUSE, NUREMBERG, DRAWN BY MR. L. S. IPSEN, ARCHITECT.

DESIGNS FOR FOOT BRIDGES. MR. F. H. BACON AND MR. B. VONNEGUT.

These designs were made by students in the architectural class at the Massachusetts Institute of Technology, Boston, in accordance with the following programme:—

A Bridge in a Park. We suppose that the reservoir by which a large city is supplied with water is situated in a public park, and that it is desired to build across it a foot bridge fifty feet in length, which shall at the same time commemorate the completion of these water-works.

Required. A plan and elevation of the bridge, on a scale of one eighth of an inch to a foot, and details to one half inch to the foot.

PROPOSED HOUSE AT BINGHAMTON, N. Y. MESSRS. HARTWELL AND TILDEN, ARCHITECTS.

DESIGN FOR A COUNTRY HOUSE. MR. A. E. BARLOW, ARCHITECT.

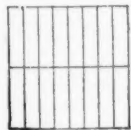
PERSPECTIVE STUDY — PLATE VI.

See the "Paper on Perspective" in this number.

URBAN HOUSING. — II.

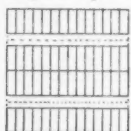
WHAT MAY BE DONE WITH SMALLER LOTS.

As an example of what could be done in the way of avoiding the worst evil of New York tenement houses, let us now consider a single one, or two, of the many plans which would be made possible if we carried out the suggestion, before thrown out, of running through the New York blocks short streets, wide or narrow according to the character of the houses to be placed on them, with a strip of ground on each side of them laid out in small lots.



Let us take a plot of ground of, say, two hundred feet square and lay it out in the usual New York manner. A plot of that size, laid out in 25×100 feet lots, will give sixteen lots. If we put one house on each lot we shall have sixteen houses. Each of these sixteen houses can have a frontage of twenty-five feet, and no more.

Let us now take a plot of ground of the same size, and lay it out in small lots fronting on short streets, say twenty feet wide, running through the plot.



A plot two hundred feet square, if laid out in lots forty feet deep by a little over fourteen feet wide, will give fifty-six such lots, beside two such short streets. If we put one house on each lot we shall have fifty-six houses. Each of these fifty-six houses will have a frontage of a little over fourteen feet, and no more. But there are houses on the Fifth Avenue of New York, in its most fashionable parts, which have a still smaller frontage, adorned with carved stone fronts, and many stories high, which are, within and without, finished in the most costly manner and fitted up with every possible elegance and luxury for the occupancy of the most fashion-

able people. I judge therefore that a very comfortable house can be built on a lot which has a frontage of but little over fourteen feet.

Again as to the depth of the lot. Forty feet is a shallow depth for a lot compared with one hundred feet. But a lot one hundred feet deep is, as has already been stated, so large that none but the wealthy can, if the ground is costly, afford to leave a large part of it vacant, nor afford to build so large a house on it as to cover the greater part of it, nor yet to live in such a large house if built. That a very pleasant and fairly commodious house can be built on a lot less than forty feet deep and less than fourteen feet wide, I know by experience. I have lived for nearly a year in Philadelphia in a house on a lot of less size than forty by fourteen feet. One can scarcely be more comfortable than in such a house. It was small, of course, but amply sufficient for my family. It contained a laundry, a kitchen, a small parlor, connected by folding doors with a dining room, and had four good bed-rooms, beside a pantry, a bath-room, closets, etc. There was also a small yard belonging to the house and a rear gate giving access to a side street. The house was in the middle of a block. It was bright and sunny in every part. There are thousands of such houses, not only in Philadelphia but in London, and indeed in most American and English cities and towns, except where their erection is prevented by well-meant, but ill-judged, restrictions on the size of lots and the subdivision of land. Such houses may be situated on wide and pleasant streets or on narrow ones, but yet be without difficulty, all of them sunny, bright, cheerful, wholesome, and uniting the most important factors of good and pleasant, and even of most attractive housing. Why can we not have such houses in New York? Because there are no such lots to build them on. It would not pay to build such houses on lots a hundred feet deep, and there are no others to be had in New York.

If, in the example just given, which is but one of many, such as almost any intelligent reader can construct for himself, we imagine the depth of the houses restricted, so as to leave a free yard space of ten feet in the rear of each house, there would be, where two yards came together back to back in the usual manner, a clear space of twenty feet in the rear between the houses. Taking all the houses on a block together, we should thus have a strip, twenty feet wide, of open space, of the depth of the block [that is, two hundred feet in the case of New York blocks], and open on the ends, for the rear windows of the houses to face on. There are cottages at summer resorts less favorably placed in these respects. Where picture galleries, libraries, dining-rooms and the like have been run out in the rear of some of the finest New York private houses, and in the case of most New York hotels, there is often no such clear space, equally wide, and open at the ends, in the rear of the buildings. The grasping nature of man will always tempt him, nay, will very properly prompt him to make use of all the land on which he is forced to pay taxes and the yearly rental which the interest on the sum it cost him amounts to. But of course, the width in the front of a house left open as a street, and in the rear left open as a yard or other air space, will vary according to the character of the houses themselves and the class of owners, or tenants, which it is desired to attract to them. When streets or open spaces of twenty feet wide are not wide enough, they may be made considerably wider, and also when divided the houses may be made considerably deeper than in the example just given, and still allow us to have many more houses on a plot of ground of a given size (as for instance on one New York block, if laid out after this method,) than is possible with a system which obliges all the lots to be one hundred feet deep.

The whole subject of the width of streets and size of lots, should be so far allowed to regulate itself, that those who could afford to pay for living on a wide street could do so, and yet live in a wholesome and respectable manner. Now, every one in New York, however small his means, is compelled to live on a wide street. But this compelling, which looks like a beneficence to the poor, and probably was so intended by its authors and promoters, is really a curse to them. As long as the yard spaces in the rear of houses are not kept open by force, in a way which would be neither possible nor desirable, it is for the interest of their owners to make use of them in the only way left to them, namely, to extend the buildings, which must by law front on wide streets, so as to contain as many as possible of the people whom the law compels to live on wide streets. The pressure now put upon landlords and tenants is like the pressure we can put upon an air-cushion. If we put a pressure on one place it must find relief in another. We cannot compel the impossible. We cannot compel people to live in better style than their circumstances make possible. We can compel them to live in a wide street. But if to do so in good style, or even in a fairly wholesome way, is beyond their means, they must do it in a bad style and in a most unwholesome way. Legislation says to the poor man, "You must live on a street at least sixty feet wide, even if, in order to do this, you are compelled to live without windows, light, or air. So legislation, in this case, as in most cases where it attempts to interfere with the laws of trade and the natural adjustments of demand and supply, defeats its own object. The law of the independence of motions teaches us that it is almost impossible to catalogue all the factors which enter into any but the very simplest problems. We see, in the dark, windowless, unventilated chambers, which are the worst feature of the tenement houses, and of too many of the other dwellings of New York, a result of imposing conditions, without perceiv-

ing all the bearings of a problem. We see that, by not taking into account the poverty of some of its citizens, the limited number of frontages of a certain size in the city, and other factors of a like kind, the result of an action founded on the best intentions is most disastrous. It has developed an evil which is without parallel in the world.

Had there been free trade in real estate, and the possibility of purchasing small lots, to put small houses on, much of the now remaining vacant space on the island on which New York is built, which is paying taxes but yielding no income, would have been long since covered with buildings of moderate cost and have yielded incomes to the owners of land. These buildings would in time, by a natural law of the growth of cities, have made way for finer buildings, just as fast as they were needed. Those owners of land who preferred to hold their land vacant, with the idea that they could so better control the character of improvements, could have done so just as well, without compelling the whole city to do likewise and to be competitors with them in such speculations. But, even if this be not so, if some have made fortunes in a few favored localities, by the New York deep-lot system, which could not have been made without that system, and its attendant but not intended evils, at what a price of suffering, in remoter parts of the city, have those fortunes been made! And, after all, the making of fortunes, in that way, does not benefit the great mass of owners of city land. Such cases, at best, are the exceptions. The great mass of those who make fortunes in land in cities, make fortunes by the rise in value of such land owing to the growth of the population. A real estate system which interferes with the natural growth of population by driving away the most numerous class of land buyers, namely, those of moderate means, and forces them to establish their homes outside the limits of the city, is the enemy of the owners of real estate in that city. The New York real estate system not only does this, but it does more. It not only injures those who have land to sell, by driving away their customers; it not only injures the holders of real estate, by tending, not to put up, but to keep down prices; it not only injures those it drives away, by the time and money and force spent on going and coming from a distance; but, further, it injures those who remain, whether rich or poor, in a variety of ways. The poor it jams together into tenement houses which, in regard to what I have called their worst evil, are, as I have said, without parallel in the civilized world. The rich it eats up with taxes, laid upon the real estate of the city, by the votes of the poor, the citizens who do not own any real estate, and who by the very terms of the New York deep-lot system, never can own any real estate. With an ingenuity that would be sublime if it were intentional, it is so contrived as to keep the number of real estate owners as small as possible in proportion to the number of voters, and the number of those who must pay the taxes as small as possible in proportion to those who impose the taxes, to lay the burden imposed by the many on the shoulders of the few; in fact to keep the owners of property, those who have the greatest interest in protecting it, as few in numbers and (under our system of government) as helpless as possible, in proportion to those who, having no property of their own, are inclined to suppose that they have no interest in protecting property, and yet have votes which control the disposition of property.

WORK ON THE CAPITOL AT ALBANY.

On March 19th the Commissioners for the new Capitol at Albany opened the bids offered for the work to be done in the portion of the building known as the North Centre. As the comparison of such bids is always interesting and instructive, we present those submitted for the most important work at full length:—

CARPENTER WORK.		
George Martin, Albany,	\$48,900 00	Thomas Wilson, New York,
Weller, Brown & Messmer, Buffalo,		John Clemishire, Albany,
49,948 87		Herter Bros., New York,
Pottier & Symus, New York,	49,889 00	Bryce, McCann & Co., Albany,
		76,635 85
GAS-FITTING.		
Walworth Manufacturing Co., Boston,	\$975 00	E. H. Cook & Co., Elmira,
Pierce, Butler & Pierce, Syracuse,	1,713 00	Gillies & Geoghegan, New York,
G. H. Kitchen & Co., New York,	2,700 00	Felix Campbell, New York,
Shields Bros., Albany,	4,900 00	G. H. Kitchen & Co., New York,
J. McCann, Albany,	5,030 00	59,000 00
E. H. Cook & Co., Elmira,	5,235 00	
PLUMBING.		
Pierce, Butler & Pierce, Syracuse,	7,974 00	Sinclair & Miller,
Philip O'Brien, Albany,	10,913 00	\$215,500 00
Brannion & Bros., Albany,	11,129 00	
John Hangan, New York,	11,340 00	MEDINA SANDSTONE FOR STAIRS.
M. Delehan & Son, Albany,	12,965 00	Sinclair & Miller,
J. McCann, Albany,	14,900 00	\$43,210 00
E. H. Cook & Co., Elmira,	15,486 22	
Ridgway & Russ, Albany,	16,500 00	IRON WORK.
Henderson & Dacy, New York,	16,475 00	Sullivan & Rice, Albany,
P. McDermott, New York,	19,445 00	\$6,538 00
STEAM HEATING.		
F. Tudor & Co., Boston,	\$29,441 83	For window-frames and sashes
Baker, Mitchell & Co., New York,	29,500 00	(per window),
Walworth Manufacturing Co., Boston,	29,879 00	Henselman, Hoven & Co., New
W. H. Warner, Brooklyn,	29,884 00	York,
		20,750 00
		Mohawk & Hudson Manufactur-
		ing Co., Waterford: Roof part,
		Windows, 2 at \$20 each,
		3 at \$55 each,
		48 at \$70 each,
		7 at \$75 each,
		2 at \$125 each,
		6 at \$140 each,
		Making a total for windows,
		9,759 00

The Board then went into executive session, and on opening the doors announced the following as the awards:—

CARPENTER WORK.		GAS-FITTING.	
Weller, Brown & Messmer, Buffalo,	\$49,948 87	Walworth Manufacturing Co., Boston,	\$1,713 00
PLUMBING.		HEATING.	
Pierce, Butler & Pierce, Syracuse,	\$7,974 00	Frederick Tudor, Boston,	\$29,441 83
		IRON WORK.	
		Sullivan & Rice, Albany,	\$16,746 00

CORRESPONDENCE.

A BOWERY THEATRE. — A NEW OFFICE-BUILDING.

NEW YORK.

MR. HENRY DUDLEY, architect, has prepared the designs for a new variety theatre on the Bowery, near Broome Street, with a frontage of fifty feet and a depth of one hundred. A desire for show and cheapness has led to a great, startling cornice of sheet metal work, while in other respects the front is bald. The theatre being a cheap, East-side affair, a bar-room is a prominent feature, and occupies the main place on the first floor. Back of this is the auditorium, while above, the gallery runs back over the bar-room to the front wall. The building is not very high, so the narrow and broken stairs used for reaching the upper stories are after all not such a great point of complaint. The cost of the building will be about \$20,000.

Two competitions are now closely watched by the architects of this city. The most important is that for the "Boreel Building," to stand on the site of the old City Hotel, 113 to 119 Broadway, facing the great Equitable Building. The property is owned by a lady indirectly connected with the Astor family, Mrs. Boreel, now in Europe. The present office-building on the site is very much out of repair, the walls being far out of plumb. On May 1st, the work of demolition will begin. For the new building plans were invited from Mr. George B. Post, Mr. Charles F. McKim, and Mr. S. W. Hatch. The block, which is about one hundred feet square, is to be covered with a great office-building in brick, fire-proof in material and construction. The drawings were prepared and sent for Mrs. Boreel's inspection to Europe, and this week a telegram was received saying to Mr. Charles E. Butler, the agent: "Prefer Mr. Hatch's plan, but use your own discretion." With the matter still undecided, it would be premature to speak of the merits of the submitted designs. It is a little peculiar that Mr. Post's building, which was designed in masses of Croton or Colaburgh brick, with terra-cotta finish, and is six stories in height, was to cost \$300,000, while the design of Mr. Hatch, in Philadelphia brick, and with an additional story, is fixed at a cost of \$250,000.

In the matter of the Long Island Historical Society building, Mr. Post is uniting in his new design certain features of his old one, with a number of suggestions from the building committee, and in compliance with their demand for a symmetrical structure is losing the spirit of his original design.

TOO PROMINENT.

NEW YORK, April 8, 1878.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Sir, — Permit a layman to offer a few remarks on a sentence in the description, in your last number, of Mr. Upjohn's Trinity Parish School (see under head of "The Illustrations"):

"It is rare, in this country, that we see so prominent examples of the three styles [of Gothic] at one glance, one might say."

My daily approach to New York *via* the North River has led me to observe and to study the effect of the juxtaposition of the tower of the school and the tower of the church. This is sometimes so complete that the two combine in one mass; and on a summer's morning I have seen the slate roof of the school tower so reflect the sun's rays as to create the illusion of a vast hole in the tower of the church. Coming down stream, the former begins to disengage itself, at first appearing as a sort of buttress, then as a pure excrescence, next as a smaller outlying member of the church, and finally as a detached and independent structure, with a value of its own in the irregular sky line of the city.

I speak merely as a lover of the picturesque when I say that the two towers nowhere, to my taste, "compose" well together; and as I am not able to contend that the two styles of Gothic are perfectly inharmonious, I fall back on surer ground and suggest that not only does the school tower fail to impart grandeur to the church tower by contrast (rising, as it does, to the not insignificant height of the base of the spire), but it disturbs that placid horizontal or gently declining line of roofs which extends from the Mons Equitable to the Battery. It is out of this as out of a plain that Trinity Church tower and spire rise with a majesty incontestably heightened by the absence near them of vertical lines of any description, save this same school tower.

In my view, therefore, Mr. Upjohn's later Gothic belittles his earlier and (as a monument to himself) vastly more important work. That this interference ever occurred to him, I doubt, and I suppose there are few architects whose regard for the sky-line extends beyond the particular building they are engaged upon. Respect for the characteristic outline of a city, therefore, would be an unheard-of sentimentality; but I would ask any Bostonian thirty years old whether he would not be glad to hear that a September gale had blown down that Somerset Street spire which has so long spoiled the

climax of the State House, whose dome, from one point of view, it transfixes like William Tell's apple, and, from another, hugs with the air of a sentry's musket.

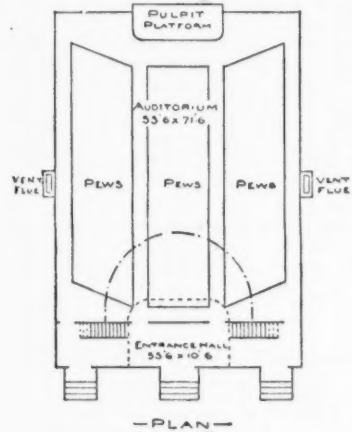
EXSCL.

A PROBLEM IN ACOUSTICS.

ST. CATHARINES, ONT., CANADA, April 3, 1878.

TO THE EDITORS OF THE AMERICAN ARCHITECT:

Dear Sirs, — Some three months ago a church was completed in this city, the acoustics of which require remedying. The voice of the speaker on the pulpit platform is not heard distinctly by those occupying the centre pews from entrance doors, and to a distance of ten feet from same, this not being the case in the side pews immediately adjoining. I herewith send you a sketch and description of the church, hoping you can suggest a remedy; if so, will you kindly inform me, either privately or in the *American Architect*. I noticed somewhere of the acoustics of a hall being made all right by stretching wires. I looked through all my numbers of the *American Architect* from the commencement, thinking I had noticed it



there, but without success. Should you recommend this wire method to be tried, will you kindly state whether to stretch the wires longitudinally or transversely and what distance to place them apart; also the height from the floor.

Any other method you may suggest to meet the difficulty give description of carrying it into effect. I have thought that the method of heating the church has something to do with the defect in hearing. It is heated by steam, having a coil whole length of pew under each seat. The air getting rapidly heated causes a continual upward current, which may interfere with the "sound wave."

The weather being cold the church has never been tried without the steam being on. There are ventilators at floor and ceiling leading into ventilating flues situated about the centre of side walls. There are no side galleries; gallery for choir over two thirds of entrance hall, projecting into church about three feet. The pulpit platform is raised about three feet four inches above floor line; floor gradually rises from platform to entrance twenty-two inches. A reply to above inquiry, suggesting a remedy, will confer a favor on

Your obedient servant,

W. B. A.

[We print our correspondent's letter that he may have the benefit of suggestions from those of our readers who may be ready to offer them. It is, however, difficult to give any confident answer to his inquiry without knowing just what trouble he wishes to overcome, and what parts of his church it affects, as well as the exact shape and treatment of his ceilings and walls.

The common difficulty is either an echo, or a reverberation, which is a confusion of echoes. These are produced by the reflection of sound from the flat resonant surfaces of floors, walls, or ceilings. The usual ways of getting over them are breaking up these surfaces by pilasters, deep ribs, open timbered roofs, galleries, etc., which destroy and confuse the waves of sound so as to prevent their reflection; or by covering with non-resonant material, such as cloth hangings to absorb the sound; or by stretching a series of wires across the rooms, which serve, in a less degree, the same purpose as breaking up the surfaces. The first thing to do in any case is to determine, if possible, by experiment from which of the surfaces the reverberation comes, and apply the remedies to those. If from the ceiling, wires may be stretched horizontally, theoretically the closer the better, practically say six or eight inches apart; if from the walls, the wires would have to be vertically in front of them, and would probably be in the way, so that hangings would be better; if from the floor, carpeting is the natural remedy. — EDS. AM. ARCHITECT.]

THE INDIANA STATE HOUSE.

INDIANAPOLIS, April 7, 1878.

TO THE EDITOR OF THE AMERICAN ARCHITECT:

Dear Sir, — The writ of mandate instituted by A. J. York, one of the State House competitors, against the State House Commissioners to restrain them from consummating their contract with Edwin May, and to call for a reconsideration of the plans, was decided in favor of the defendants. This will, perhaps, stop further proceedings by the dissatisfied architects. The public opinion has not changed in reference to the unwise selection, and the Commissioners will find they will have to work against the judgment of those who are best able to judge of such matters, and a strong current of public opinion. Mr. May has accepted two per cent. as compensation for full services.

MODERN CHURCH ARCHITECTURE.

BOSTON, April 13, 1878.

TO THE EDITOR OF THE ARCHITECT:

Dear Sir, — The communication from Troy, N. Y., printed in today's number, under the heading, "Modern Church Architecture," contains suggestions evidently derived from experience and of consequent value, though given in a sweeping tone of instruction. It is not desirable to open abstract discussions as to whether the American sectarian meeting-house is best planned with transepts, whether organist and choir are to be accommodated in a chancel, or whether the central height of the auditory will be adequate if made equal to its breadth. It is the manner in which the item of "style" is decided to which I would call attention.

"No one can object to the adoption of English Gothic, especially Decorated Gothic, as a basis," writes Mr. Cummings. "It is hardly to be presumed that in the selection of the true style to form a basis for our church architecture many will seriously maintain that we have a choice other than English Gothic," writes Mr. Littell, in an earlier number quoted.

We might the builders of those truthful monuments of the fourteenth century have inscribed upon their walls: *Architecture is finished, henceforth be content to copy.* Every true style has been developed according to the exactions of climate and customs of the land which produced it; in every true building we note the development of plan from the requirements which it was to fulfill, according to the builder's manner of thought; its façades are exponents of the interior, and its details are expressive of their functions. The requirements of our various Protestant sects are definite; they differ slightly from one another, but in almost no respect do they resemble the needs felt by the English Catholics of the fourteenth, or indeed of any other century. That American architecture is obliged to masquerade in dress of forms, outworn in past ages, during civilizations in every other respect now superseded, is deplorable. But unnecessary publication of the fact should be disparaged. It will hardly tend to raise the opinions now held of our profession by the more thoughtful public.

Most truly yours, J. T. C.

THE TRINITY COLLEGE CONTRACTS.

HARTFORD, CONN., April 8, 1878.

TO THE EDITORS OF AMERICAN ARCHITECT AND BUILDING NEWS:

Gentlemen, — In reply to the statements of Mr. Brabazon in your issue of March 30th, if you will be kind enough to allow me a small space, I will say that his assertion that I ordered or requested him to prepare bills of quantities of all the stone work of the new buildings for Trinity College, or any portion thereof, is incorrect. I am much better able to do that myself, and therefore should not feel compelled to ask, request, or hire the services of a man who was obliged to procure the assistance of a carpenter to prepare his final bid for the work. I did not use Mr. Brabazon's valuable time — for it was precious as after events proved — at all, beyond inquiring certain rates and prices for particular portions of the work, as is the universal custom. At the same time I procured prices from other stone contractors, for fear of error in judgment on Mr. Brabazon's part. Each of these men, and many others besides, were kind enough to volunteer their services to prepare estimates, of which I availed myself in a few instances around home, Mr. Brabazon among the number. Your correspondent a short time since gave a correct report of the whole case. I do not wish to prolong a discussion of no possible interest to the profession or public. If Mr. Brabazon was employed to do a certain piece of work, he would have been paid at the time, but, curiously enough, his claim was not presented until after the contract was awarded to another party, some three or four months afterward. Professional building surveyors usually present their bills or secure one payment at least before the expiration of that length of time.

To sum up the whole matter, if Mr. Brabazon had been employed, I would have certified to his account as soon as the work was done, and it would have been paid promptly. He was not, and therefore I refused to do it. The decision of the judge was as great a surprise to the local contractors as to myself.

Respectfully,

FRANCIS H. KIMBALL.

COMPETITIONS IN INTERIOR DECORATION.

THE committee on the last competition have awarded the prizes as follows: the first prize to the design marked "Midnight Oil," the second to "A Rough Sketch," and honorable mentions to "H" in a circle, and "Ars longa, vita brevis." A detailed report will be given in our next number.

COMPETITION NO. 3. — THE DECORATION OF A WALL.

THE subject of the third competition will be a portion of a dining-room wall between two windows which are twelve feet on centres, the room being fourteen feet in the clear. As the problem is essentially a problem of surface decoration the dado and frieze, if employed, should in treatment be properly subordinated to the wall. The drawings should be received at the office of the *American Architect and Building News* on or before May 11. Required: an elevation and details to a larger scale. For conditions and regulations see *American Architect and Building News* for January 26 and March 2.

NOTES AND CLIPPINGS.

PENNSYLVANIA'S HEROES. — Robert Fulton and General Peter Muhlenberg have been chosen as the two men who have reflected the most glory on the State of Pennsylvania, and are therefore the most suitable subjects for the two statues which that State is allowed to place in the Hall of Heroes at Washington. Fulton's merits are well known to all, and are beyond dispute. General Muhlenberg was a clergyman in the Church of England, who, after a stirring sermon on the duties of patriotism, threw aside his gown, appearing in a soldier's uniform, with the words: "There is time for all things, — a time to preach and a time to fight, and now is the time to fight." He served with merit and rose to the rank of major-general. It was generally believed that General Anthony Wayne would be one of the heroes selected to represent the State. The sculptors who are to execute the statues have not yet been determined on.

BUILDING ACCIDENT. — The key-stone of the door-way arch of a school-house at Canton, Ohio, fell the other day upon a school-girl who was entering the building. The stone weighed about a hundred weight, and by its fall crushed the girl's foot so that amputation was necessary. The accident caused a panic amongst the other scholars, who imagined that the whole building was about to fall.

THE POUGHKEEPSIE BRIDGE. — The details of the construction of the bridge over the Hudson at Poughkeepsie, are not without much interest. This bridge, which is to connect the coal regions of Pennsylvania with New York City and the Eastern factories more directly than they are connected at present, is to consist of five spans of five hundred and twenty-five feet each, which are one hundred and thirty feet above the level of the river at high tide. The force of the river's current and the depth of the river at this point render the sinking and securing of the caissons which are to form the foundation of the bridge piers, matters of no little difficulty. The caissons are made of heavy squared timber, framed together so as to leave forty compartments extending throughout the height of the caisson. Twenty-eight of these "pockets," as they are called, have tight bottoms and receive the concrete which is needed to sink the structure to its position. When the bottom of the river is reached dredging is resorted to; the "clam-shell" dredges working in the twelve bottomless pockets, which are eleven feet square. When the dredges have finished all that can be done by them, divers descend and finish the work by thoroughly cleaning the river's bed and removing all sediment. Concrete is then filled in to these twelve pockets till it reaches the top of the caisson, which rests twenty-five feet below the surface of the water, and the foundation is ready to receive the stone-work of the piers. The caissons are fifty by one hundred feet in area, and their lower ends are solid for a distance of sixteen feet and are wedge-shaped, so that they may more easily sink to position. The distance that the second caisson had to be sunk was one hundred and twelve feet below high water level. The cost of the bridge will be between three and one half and four million dollars.

A BRIDGE ACCIDENT. — We have often wondered how much heed was ever paid by teamsters to the placards which are posted at the entrance to bridges forbidding the transport of loads weighing more than a certain amount. Many a bridge doubtless gets a fatal strain by being subjected to an excessive weight, but holds up long enough to receive and fall under an apparently safe load. Hence the censure of the coroner on builder and engineer. One of the most singular uses to which a bridge can ever be put was instanced at Poland, Ohio, where an iron bridge less than a year old was subjected to a load which the designer and builder could never have imagined it necessary to provide for, — a house. It is hardly necessary to say that although the house had almost finished the passage, the bridge fell, and killed two men.

THE UNITED STATES AT PARIS. — The façade of the United States section in the main exhibition building is said to be in a very forward condition, thanks to Mr. Petit's energy.

A NEW BRIDGE OVER THE THAMES. — A bridge of such proportions as the world has never yet seen is proposed by Sir Joseph Bazalgette, for the purpose of connecting the two banks of the Thames in the vicinity of the Tower, and the plan has received the approval of the Metropolitan Board. The operation contemplated by the Board consists in building up a structure of steel crossing the Thames in one tremendous span, clearing the water at such an altitude that three fourths of the masted ships which require to do so will be able to pass under the elevated roadway without any hindrance, while the remaining fourth will merely have to lower their topmasts, which they may very well afford to do, as topsails are not needed in the Thames above Gravesend. The case now before us affords a striking instance of the great practical results which are apt to follow from improved processes in the arts. Steel, when perfect in its composition, is capable of bearing a much more severe strain than iron, but the difficulty has been to insure uniformity of quality in the superior metal. Sir J. Bazalgette observes that until a recent date the costliness of steel and the uncertainty as to its quality have prevented its use in large structural works. But the improvements which have been effected by Dr. Siemens and others in the manufacture of this metal have rendered it more thoroughly trustworthy, and have enabled it to be produced at a moderate cost, with nearly double the strength of iron. Hence it is now possible to construct such a bridge as would have been practically out of the question a few years ago. One bold span of eight hundred and fifty feet will carry the proposed highway across the river from the Irongate stairs to Horseleydown. Of course the approaches extend farther inland. The bridge is designed in the form of an immense span, and is composed of two parallel girders, the arch springing from the foot of that which appears to be a flanking tower on each side of the river. The roadway passes almost in a level line very near the top of these towers, and intersects the arch at a short distance from the shore, the greater part of the roadway being suspended from the parallel girders between which it passes. The design is, in fact, a simple one, and if it does not strike the eye at once as possessing any degree of elegance, it cannot be called altogether ugly. — *London Standard.*

DEFECTIVE SEWERAGE. — In consequence of the bursting of a sewer, a considerable section of South London is flooded to the depth of two or three feet. Much damage has been done on Brixton, Loughborough, Kennington, Clapham, and Camberwell New Roads.

THE OBSERVATORY AT ARMAGH. — The astronomers at the observatory at Armagh, Ireland, were for a long time troubled by unaccountable variations in their fixed instruments. Detecting the fact that the variations were caused in some way by wet weather, they investigated the foundations, and found that a stratum of clay passed under the building and swelled or contracted according as there was more or less moisture in it. It would be interesting to know what means were adopted to counteract this apparently uncontrollable phenomenon.

AN IMMENSE MODEL TENEMENT. — The *London Daily News* states that Lady Burdett Coutts is negotiating for land in Osnaburgh Street, on which she intends to erect lodgings for the poor, capable of accommodating 10,000 persons, at a maximum charge of four shillings sixpence weekly per domicile. We hope that this philanthropic lady will not follow the example of the banker, Mr. Hankey, and undertake to house this small army of tenants by carrying the building twelve stories into the air. We cannot but think that there must be an error of a cipher or two in the number of tenants mentioned by the *News*.

UNSAFE DAMS. — The heavy spring rains have caused much uneasiness to people who live in the water-ways below any suspected dams. As yet, none have given way; but the dam at Ashburnham, Mass., which gave way in 1850 with such disastrous results, is now watched with much anxiety, as it is reported leaking. The dam, which is some two hundred feet long, is said to hold back one hundred acres of water.

THE PAINTINGS AT THE LUXEMBOURG. — It has been determined, most foolishly, to remove from the Luxembourg Palace the paintings of modern artists which are usually exhibited there, and hang them, during the exhibition, in the French section of the gallery of the fine arts. If this is really done, it will not only occupy a large part of the already too limited space, but it will lessen materially the attractions of one of the most frequented resorts of the traveller and the amateur. The committee who have charge of the department of sculpture have adopted a wiser course. All statues and pieces of sculpture worthy of mention are to be entered in the catalogue, with full information as to their position and the means of seeing them, but are to remain in the places they now occupy, be it in a public square, a church, a public building, the Louvre or the Luxembourg. It may not be known that the galleries of the Luxembourg are, as it were, a kind of artistic purgatory, in which are placed the works of modern artists which the government sees fit to buy; here they remain during the lifetime and until ten years after the death of their authors. Then they are transferred to the galleries of the Louvre.

Later information has reached us to the effect that the Minister of Public Instruction has authorized sculptors to exhibit at the Exhibition the original statues on condition that they substitute for them in the public squares plaster casts which are to remain until the originals are replaced.

IMPORTANT TO PAINTERS AND SCULPTORS. — It has been decided that painters and sculptors who send their works to the Paris Exhibition may add to the name of the work exhibited the names of any other works of theirs that may have been executed either on or in public monuments.

ART BY THE YARD. — The other day the cyclorama of "Paris by Night," which was exhibited at Philadelphia during the Centennial, and since, was sold at auction for \$250, which was probably less than the 40,000 square feet of canvas were worth. The original cost is said to have been \$75,000.

THE BRASS FONT AT LIÈGE. — The *Academy* says that the South Kensington Museum has lately received a cast of the brass font in the church of St. Bartholomew at Liège. This font is attributed to the Flemish sculptor Lambert Patras, and thought to have been made in 1112. Around the font are represented in bold *alto rilievo* the baptisms of the apostles, with that of Christ in front, around whose figure the water ascends like a garment, while two angels stand by with offered towels. The apostles are immersed for half their lengths in small tubs, and are very droll to look upon. Below these figures is a series of twelve bulls, also in high relief, remarkably well individualized in expression and action.

AN UMBER BED. — Mr. B. J. Newell has discovered in Dalton, Mass., a bed of umber of considerable size, which analysis shows to be equal in quality to the best Turkish umber. Almost all the umber used in this country comes from Turkey and the Isle of Wight. It is found only in two other places in the United States, — in Oswego County, N. Y. (in such small quantity that it is not worked), and in the mountains of North Carolina, so far from a railroad that it is not dug.

SPONTANEOUS COMBUSTION. — A writer in the *Mechanics' Magazine*, London, in giving an account of his experiments with spontaneous combustion, states that he took a handful of cotton waste, soaked it in the oil to be experimented upon, wrung out the excess of oil, and then put it into a box with some dry cotton. The box with its contents was then heated to 175° Fah., and in 75 minutes the cotton saturated with boiled linseed oil was found to be on fire. Boiled linseed oil and seal oil were found to be the most combustible; next in order came lard oil, which took four hours; raw linseed oil took four to five hours; rape oil and Gallipoli olive oil took a little longer than the last. All the oils thus named are ethers of glycerine. Castor oil, which is not an ether of glycerine, took two days to ignite spontaneously; sperm oil, too, does not ignite; and the petroleum actually stop the spontaneous combustion of the oils above mentioned.

THE VERSAILLES GALLERY. — Several rooms at Versailles, hitherto closed to the public, are to be opened from May 1st. They contain as many as 1,000 historic portraits, dating from the foundation of the monarchy to 1790.