Publications, 1865, 1899, 1900, 1909

The architects, and others, to whom this pamphlet is sent, will accordingly do a great kindness to the writer, and through him to the School, if they will favor him with the opinions they may form in regard to the scheme of instruction here suggested, or in regard to any of its details. Approbation and disapprobation are equally necessary, and will be equally welcome.

Setting aside then, for the present, any question of Fine Art, it will not be denied, that, regarded merely as one of the useful arts, the position of the art of building in this community renders it peculiarly open to the good offices of the Institute. Here, if anywhere, is there need of having the simplest, cheapest, and most enduring ways of doing things found out, and when proved made public, and of having workmen trained to skill in those methods. The best ways of using the common materials of building, of discriminating among them and estimating their quantity and cost; still more, the best ways of distinguishing and employing the materials that are not so common,- are matters on which every builder and every architect needs full and accurate information. And all need the same; namely, the best that can be had. And not only in matters of construction, but in the whole detail of building affairs, those who are the most experienced in them are the most ready to complain of the want of system, of recognized forms of procedure, of well-digested and approved methods.

Every one engaged in these affairs has, of course, ways of his own that answer his purpose well enough; and almost every one has some clever devices of his own, particulars which he has for some reason worked out for himself, on

which he specially prides himself, and knows he cannot be surpassed. One man has a brief and neat way of getting out his quantities; another, for jumping at his sum-total; another has an admirable system in his specifications; another, a convenient trick in perspective, or in making working drawings. But, in most particulars, every one knows that there is room for improvement; and he would gladly go about and exchange ideas with his fellows, if time and opportunity offered. But time and opportunity do not offer. Architects are not, as we have seen, brought together in their work; and men sufficiently engaged in affairs to make their experience worth exchanging, have no leisure to give to societies of mutual improvement, and to the reduction to a system of their fragmentary wisdom. If their young men can pick up anything new outside, well and good; so much the better for all concerned: but it must lie with them. They would gladly see things improve, but cannot undertake to do anything about it themselves. This is, I venture to say, the attitude of every architect, every builder, every mechanic in the city, who has any claim to character and intelligence. They agree in deploring the want of superior methods, established by a general conformity; and I am greatly mistaken if capitalists and men of business do not often find cause to share in their regret.

This is just the state of things for this Institute. The trouble is technological; there is a want of system and method, and of means for a general collection, and a general diffusion of their results. It seems possible to find in this School the means both of collecting and of disseminating this knowledge. Without going into detail, or pretending, indeed, that the details of the scheme are yet worked out, which they are not, it is enough to say, that the School may perhaps be availed of, not only to give to draughtsmen and students a sort of training they cannot easily find elsewhere, but it may act through them as a sort of professional exchange for builders and architects. All the School need do is to separate and classify the topics that occur in the practice of the art, and give them out, to the classes, as subjects of study and investigation. Such are the principles and processes of the various mechanical arts employed in building, the estimating and surveying of work, and the organization and superintendence of workmen, the keeping of accounts and regulation of payments, the drawing-up of specifications and contracts, and the customs which regulate the intercourse of architects with their clients and with the mechanics they employ, and the laws upon which these customs ultimately rest. The more strictly scientific subjects of lighting, heating, ventilation,

and acoustics would, of course, be included. On many of these subjects it would be desirable, and it would probably be found perfectly feasible, to have special lectures given in the School by experts in them. The regular pupils within its walls would proceed to collect, under the guidance of its officers, the best information that can be obtained from the accredited sources; while the pupils attached to the offices in the town would lay them under contribution for the fund of special study and personal experience peculiar to each. All would use every opportunity to increase their resources by observing work actually in progress, and by conversing with mechanics. Upon a comparison of results, the particular subject in hand would probably prove to be pretty well exhausted, at any rate, all the questions that were not answered would be very distinctly asked, and their discussion would point the way for a really advanced research. A method of study more edifying for the students, it would be difficult to name; while for the profession it would establish at once a sort of architectural exchange, or clearing-house for the interchange of knowledge and skill; only, instead of a striking of balances and a payment of trifling differences, some of gain and some of loss, each would

carry away what all had brought, while the whole would remain behind. The sum of available knowledge would be increased a hundred-fold. The offices would be enriched by the returning streams, and the School would accumulate, from year to year, a priceless treasure of traditional lore.

Such studies and researches would make the student more conversant with every variety of the practical and business affairs with which he is expected to be familiar, than he could probably otherwise become, except by a personal experience in each. But life is too short, and the range of studies too extensive, for so slow a schoolmaster. A certain amount of experience is of course necessary, at last, to transform the student into the man of business: this he must obtain while serving as an assistant or draughtsman in an architect's or builder's office; and the more complete his previous theoretical knowledge of his subject, the more rapid will be his progress in this practical schooling. Enough experimental acquaintance with it to make these studies and researches intelligible and really instructive can be gained from the systematic study of buildings actually in progress, from laboratory manipulations, which should be made to embrace as great a variety of work as possible, and especially from the collections of illustrative drawings and models

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Thus far with the useful art; thus far we have had to do with Building proper, and with the instruction we propose to give in its methods. But we have to take up the subject also in its relations to fine art; the School cannot, if it would, avoid the consideration of Architecture proper, into which building naturally grows as it assumes the beauty, first of fitness, then of expression, then of grace.

Architecture is indeed very much like literature, not only because it has the same curiously ambiguous character as language, being partly a matter of history, partly of natural history; half a natural product, half a product of human will; both being founded in the immemorial past, and exhibiting in their development the same subtle influences of race and climate, similar laws of tradition and derivation, a constant resolution and recombination of elements, all controlled by aesthetic laws, which spring partly from the nature of things, partly from custom or caprice, - but also because, in an essential characteristic, architectural work is like literary work. Both writing and building range all the way from mere work of necessity, the satisfaction of every-day requirements, up to the pure expression of abstract sentiment, where the form, not the function, is all in all. Upon this lofty level, this Parnassian height,

the home of genius, literature and architecture become poetical; they are transfigured, and mingle on equal terms with painting, sculpture, and music. But they differ from the other fine arts, and they differ from the merely useful arts, in this, that there is in each an intermediate region, above the reign of mere utility, though still mainly utilitarian; and below the realm of poetry, though still thoroughly artictic. This middle ground is in literature the field of liberal education, and in architecture the field that we propose to occupy. It is the region of good sense and good taste, of knowledge and skill, of intelligence and refinement, and of talent, perhaps, rather than genius. The fruit of its cultivation is in literature a prose style, clear, graceful, and intellectual; and a style in building, simple, elegant, and rational, suited to the best requirements of every-day life.

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It is in establishing a high critical standard of performance in work of this sort, that, as I have said, educational institutions find their proper vocation. And it is as true here, when we are treating of style, as it was just now when we were speaking of the mere utilities, that, in the nature of things, an organized institution has, in this work, altogether the advantage of private enterprise. This thought has been recently developed, in its literary relations, with so much brilliancy and candor, by a critic whose name is identified,

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"An institution like the French Academy - an institution owing its existence to a national bent towards the things of the mind, towards culture, towards clearness, correctness, and propriety in thinking and speaking, and in its turn promoting this bent - sets standards in a number of directions, and creates, in all these directions, a force of educated opinion, checking and rebuking those who fall below those standards, or who set at nought ... It is not that there do not exist in England, as well as in France, a number of people perfectly well able to discern what is good in these matters from what is bad, and preferring what is good: but they are isolated; they form no powerful body of opinion; they are not strong enough to set a standard, up to which even the journeyman-work of literature must be brought, if it is to be vendible. Ignorance and charlatanism,

in work of this kind, are always trying to pass off their wares as excellent, and to cry down criticism as the voice of an insignificant, over-fastidious minority; they easily persuade the multitude that this is so when the minority is scattered about as it is here; not so easily when it is banded together, as in the French Academy."

It remains, then, for us to consider how we had best take up this instruction in Architecture proper, so as to inculcate sound and serviceable ideas in regard to architectural composition and design. There may be good building without it; but there can be no good architecture unless it is taught, and taught well. The question is twofold: what shall be taught, and how shall the instruction be given?

By addressing itself to that which I have ventured to call the prose aspect of Architecture, that aspect which it presents when regarded neither as a fine art altogether, nor yet as mere building, and in which it appears rather as one of what are called now-a-days the Industrial Arts, or arts of design, the School hopes to avoid certain difficulties, both of theory and practice, which perplex the path of those who take in hand the highest artistic training. The highest attainments in the fine arts can be reached only by men of genius; and it is a question not easy to answer for those, the success of whose undertakings depends upon an unlimited supply of this rare and delicate staple, how men of real genius are to be found, and, when found, how they are to be treated so as not to diminish or quench the heavenly spark. By directing our methods to meet the wants rather of talent and intelligence, of the common mind, not of the exceptional mind, we give prominence to what must always be the main work of a school, and, as I have said, steer clear of these perplexities. At the same time it is undoubtedly the office of a first-class school, as has been well said of late, not only to "give all its students as high a culture as they can receive, and thus steadily raise the tone of the community by sending in

a constant influx of cultivated minds, but also to develop to the highest point minds of the first class." Now, the most efficient agency for bringing out all the powers of first-rate men has been found, both in literature and in architecture, to be that of competitive examinations of great difficulty, in the preparation of which every facility is offered, but all possible freedom allowed; and for which the prize shall be not only honorable in the highest degree, but shall have, if possible, a real value. This last provision is not necessary at any given moment to get the maximum of work out of the competitors; the honor suffices for that; but it is of great use in bringing into the school the best talent from the largest community.

I believe, then, that it is as necessary, in order to find men of unusual parts, as it is in order to develop them when they are found, and that it is the most efficient way of doing either, to establish very difficult examinations, backed up by a very small number of very large prizes. The system is indeed very liable to abuse, and has undoubtedly, when injudiciously administered, led to evils which it must be our care to avoid, taking warning, as well as example, from the experience of others, but some such system seems to be as indispensable to the regular production of highly accomplished first-rate men, as is a course of daily discipline to making the most of average men. Happily, in the study of architecture at least, both may be done at once. The same appliances that serve to start the man of talent upon a successful career, set the man of genius on his way to the stars.

There can be no more mistaken or mischievous notion, it seems to me, than that there is a natural conflict between men of natural force and genius and men of education, unless, indeed, it is the notion, that, when they are brought into conflict, it is the self-trained man of genius who holds his own, and the man of education that goes to the wall. Our public life, indeed, sometimes

exhibits its chief successes in the persons of men born and bred in the woods and wilds. But the art of administering government is with us, as yet, still in its infancy. Our political system is still primitive and crude; only its main principles have as yet been struck out; and only the simplest methods of availing of the natural forces at our disposal, so to speak, have as yet come into use. Our domestic relations, at least, are still in that state of development in which, in all the arts, a vigorous common sense and singleness of purpose are most efficient.

We have in this country the most intelligent population in the world; I mean not only that more persons have reached that stage of intellectual development at which an advanced culture becomes possible, but that a certain quickness of intellectual sympathy, a readiness to understand things as they really are, and to act accordingly, is a characteristic of those persons. Now, Architecture, of all the arts, most distinctly requires this sort of intelligence. It is founded on necessity, and is amenable to reason. We are making great strides in material prosperity and in public and private magnificence; and Architecture, of all the arts, most directly ministers to a proper pride. There is every reason, then, to hope for an abundant reward for our labors in the near future. There can be no want of good seed; the moral temperature promises to be favorable; we have only to prepare the ground.

It is said of the ancient Jews, that, while all the nations of the Gentiles cherished glorious traditions of a fabulous past, they alone, though not without a history, set their golden age in the future. The people of the United States, in like manner, equally conscious of being a chosen people, set apart to preserve the sacred ark of Liberty, and transmit the true faith to the nations, habitually dwell in imagination, not on the glorious past,

but upon the still more glorious time to come. In the career which that time has in store, no one would deny that the development of the arts is an essential element; and, of all the arts, Architecture has most immediately to do with the greatness of the commonwealth. It is by the aspect of its buildings that a great country asserts its greatness. The buildings of any people cannot fail, indeed, like their personal conduct, to be in a certain sense individual and characteristic; but it is of grave importance that our public buildings, as well as our natural manners, shall be also excellent in themselves, and that they shall express our best characteristics. It is the aim of this School to do what it can, in its day and generation, to insure that the Architecture of the future shall be worthy of the future.

See Technology Review

April 1940

p. 237

The Teaching of Architecture
by
William R. Ware

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We have in this country the most intelligent population in the world; I mean not only that more persons have reached that stage of intellectual development at which an advanced culture becomes possible, but that a certain quickness of intellectual sympathy, a readiness to understand things as they really are, and to act accordingly, is a characteristic of those persons. Now, Architecture, of all the arts, most distinctly requires this sort of intelligence. It is founded on necessity, and is amenable to reason. We are making great strides in material prosperity and in public and private magnificence; and Architecture, of all the arts, most directly ministers to a proper pride. There is every reason, then, to hope for an abundant reward for our labors in the near future. There can be no want of good seed; the moral temperature promises to be favorable; we have only to prepare the ground.

It is said of the ancient Jews, that, while all the nations of the Gentiles cherished glorious traditions of a fabulous past, they alone, though not without a history, set their golden age in the future. The people of the United States, in like manner, equally conscious of being a chosen people, set apart to preserve the sacred ark of Liberty, and transmit the true faith to the nations, habitually dwell in imagination, not on the glorious past,

but upon the still more glorious time to come. In the career which that time has in store, no one would deny that the development of the arts is an essential element; and, of all the arts, Architecture has most immediately to do with the greatness of the commonwealth. It is by the aspect of its buildings that a great country asserts its greatness. The buildings of any people cannot fail, indeed, like their personal conduct, to be in a certain sense individual and characteristic; but it is of grave importance that our public buildings, as well as our natural manners, shall be also excellent in themselves, and that they shall express our best characteristics. It is the aim of this School to do what it can, in its day and generation, to insure that the Architecture of the future shall be worthy of the future.

COMPETITIONS

BY

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Competitions.

IT is generally agreed that whenever it is practicable to appoint the architect of any building, public or private, outright, it is best to do so. For this is not practicable unless there is a consensus of opinion on the part of the owners or their representatives upon some one practitioner, and such unanimity affords fair presumptive evidence of the fitness of the appointment. Direct appointment, moreover, ensures an intelligent understanding between architects and their clients from the very beginning of the work, the time when such relations are most important. In competitions a great gulf is fixed between an architect and his client, such understandings are impossible, and misunderstandings are likely to occur. Even the most elaborate programme must leave many questions unanswered, and the most carefully prepared instructions will admit of more than one interpretation. Moreover they necessarily leave the prejudices and preferences of the owners unexplained. The competitor must proceed in ignorance of the determining conditions of success, and work blindly and at haphazard. What is still more distasteful is this, that it must be his chief care, as a matter of business, to present not so much the best solution of the problem in hand as the one that will best meet the predilections of his clients or of a jury, or what he fancies to be such, his immediate object being not to do the best thing, but to secure the work, not to do what he thinks best but what he thinks other people will think best. This puts him into false and uncomfortable relations both to the work and to his clients, and he hates it. Add to this the knowledge that his work will probably all be thrown away and the job be given to somebody else, more skilful or more fortunate than himself, and we need not wonder that men go into competitions in a half-hearted way, and are disposed to put into

them only half their mind. It naturally happens accordingly that the problem often fails to engage the eager attention and serious study needed for its successful solution, and that the work is turned over to draughtsmen to make out of it what they can. Under these circumstances, a false start is likely to be made through failure really to understand and grasp the problem, and a poor result is apt to ensue through indifference or preoccupation of mind.

Competitions also in their very nature involve a great waste of time and money, since the labor of all the competitors but one is without practical results. The waste is the same whether, as in paid competitions, the loss falls upon the owners, or, as in an unpaid competition, upon the profession. Every competition, if at all extensive, costs the profession hundreds and thousands of dollars, most of which falls upon men who can ill afford the loss. It is cruel and heart-breaking, when fifty or a hundred sets of drawings are submitted for judgment, to consider that in all but one the laborers have labored in vain, and that out of all the schemes only half a dozen can possibly receive any serious consideration. Even in paid competitions, in the absence of anything to keep the expenses within the limit of the payment, the waste is sometimes equally appalling. Thus the profession groans and travails night and day, year in and year out, under the strain of sacrifices it can ill afford to make. No wonder that the system has come to be regarded as a sort of nightmare, as an incubus or vampire, stifling the breath of professional life, and draining its blood. No wonder that architects extol the system of direct appointment, under which they can set to work promptly, without spending time and money in ill-advised endeavors, and can address themselves at once, intelligently and sincerely, to the real task to be performed.

But the conditions which make a direct appointment possible cannot always be fulfilled. They are indeed seldom to be met with, except in purely private undertakings. A single owner may presumably have a distinct personal preference for a particular practitioner, an arbitrary and unintelligent preference perhaps, but still a preference. But among half a dozen proprietors there is very little chance of all having the same. The probability is that they will not be able to agree whom to employ. In the case of public work also it may be considered impolitic or improper, as having a color of favoritism, to appoint an architect outright. A competition of some sort is then inevitable, and it must be accepted with all its disadvantages.

Much may be done, however, to diminish the gravity of these disadvantages. The work done in drawing up the instructions for a competition, involving, as it must, a tentative study of the problem in

hand, will often largely take the place of the preliminary consultations between the architect of a building and its owners. Limiting the number of competitors and paying them properly, even handsomely, for their work, will encourage them to do their best. The enormous waste of money and time and labor that competitions often involve can in a large measure be avoided by excluding splendor of draughtsmanship and limiting the size and number of the drawings asked for. It is not necessary for the purpose in hand that these drawings should make a complete exposition of the several schemes submitted. It suffices if they indicate the distinctive points in each, so that an intelligent choice may be made among them.

Since, then, competitions cannot be entirely got rid of, it is worth while to point out not only that the evils attending them may thus be greatly alleviated, as experience has shown, but that the method of getting the building one wants by comparison and selection among a number of possibilities is not without positive advantages. Choice and selection are habitually employed in the sale and purchase of all other works of taste and skill, whether in the decorative or in the fine arts, and they may well be equally serviceable in architecture, both to the community and the profession.

In the first place, competitions naturally tend to reduce to a minimum the evils which are inherent in the other system. For the custom of appointing the architect of a building outright is not without its own disadvantages, as may be witnessed in the undesirable structures which architects constantly erect in the freedom of private practice, unchecked by the wholesome hindrances that a competition imposes. It must not be supposed that the owner is always to blame for the unhappy things that not infrequently meet the eye in town and country. Sometimes, indeed, owners distinctly prefer ugly things. But quite as often they are helpless victims, and patiently submit to the caprices of their professional adviser, under the impression that he doubtless knows his business and is conducting it in accordance with the rules of his art. This would seem to betray an unexpected and almost scriptural meekness in the men who inherit the earth.

It is sometimes indeed assumed that all that is needed to secure a good building is the employment of a reputable practitioner. But this is not so. Even the best and the best esteemed of men are likely to do most ill-advised things. Such is the intrinsic difficulty of the architect's task, and so impossible is it for even the best trained and the best endowed men to be always at the height of their powers, that there is no telling what they will not do when entrusted with an open commission. When one wants to have a landscape by

a painter of note, he generally waits until it is done before he buys it. If he is so rash as to order it in advance, he takes the risk of having to put up with what the dealers call an inferior work of the master. But he is not obliged to hang his picture. The owners of real estate have no such resource. They have to order their building beforehand, and when it is done it cannot be hid. The only choice a client has lies among the various suggestions of his chosen adviser, and these he is not generally in a position materially to influence. He does not find out what he really wants until it is too late to say. This consideration may well make him cautious, and dispose him to assume all the trouble and expense of a competition, rather than enter blindly upon a course which he can neither direct at the beginning nor control at the end. A competition will at least give him some choice of advisers, and prevent his committing himself to any of them until he knows what they are proposing to give him. It may then happen, and sometimes does, that the happy inspiration of a young or little-known architect will be more to his purpose, and be really better than the suggestions of older and even abler men. A competition enables him to secure the good and escape the bad.

In theory, of course, it is the duty of an architect, and his delight, to discover all the practicable solutions of his problem, and if there is more than one of real promise, to let his client choose among them. But, in fact, no man can command the time for this, even if he has the energy and personal resources. Days are not long enough to do business in this fashion. What generally happens is that, among the two or three solutions that first occur to him, the architect selects the one that best suits his own turn of mind and imposes it upon his client. The only way his client can really get a choice between different schemes is by employing different men to get them up. At any rate, this is the only way of making sure that they shall be really different, not merely variations of one theme, or different airs pitched to the same key, as the varying suggestions of the same mind can hardly fail to be.

From these risks and uncertainties competitions are a great protection. There is, of course, an element of precariousness in all enterprises, but there is no undertaking in which the results of a mistake is more serious, or in general more irremediable, than in building, or in which they involve a greater misappropriation of capital. There is nowhere greater need of using every known precaution.

The discussions and comparisons which a competition involves would also seem to offer the only chance of efficient and serviceable

criticism that the design for a building can obtain. For they come at the moment when the scheme is substantially completed and before it is put in execution. After a building is up, discussion of its merits and defects, however edifying, is of but little practical service. It is only indirectly and remotely applicable to any future work, so much do conditions differ, and for the service of the work in hand, pointing out radical errors in a design is merely obstructive unless there are alternative designs to which to turn. These, a competition provides, and it subjects all the designs to an examination that is both seasonable and effective. The successful one is tested by the most exacting and pertinent of tests, a comparison with other designs of exactly its own kind. The unsuccessful designs suffer no reproach, or suffer it in good company, even though many of them are consigned to a not undeserved oblivion. It has often been said that in every Department of Public Works there might well be a sort of Censor, or Aedile, or a Committee, to pass upon the designs of buildings proposed for erection, and in fact the Department of Public Works in New York has sometimes taken this course, inviting experts to pass upon the designs made for city buildings. Buildings erected from designs submitted in competition hardly require such an *imprimatur*.

Architects generally dislike competitions and deprecate the system. For the pangs of disappointed expectation are more poignant and are longer remembered than the satisfactions of success, and they seem more uncalled for. Indeed success always appears to the winner to come quite in the order of nature. That the general voice of the profession should be raised against them is indeed inevitable, by the mere doctrine of chances. Just as, after an election, there are always more people gratified than disappointed, so after a competition there are necessarily many more people disappointed than gratified. Only the winner is satisfied with the way the system works, and even he is not eager to risk it again. This is part of the situation, and of course, except for the joy of contention, which does not count for much, one would always rather have work given into his hands outright, in recognition of his deserts, than to have to prove his claims every time. It seems a more satisfactory system. All this is natural enough. The fact that nobody likes competitions may accordingly be discounted. It signifies nothing. It is no proof that they are not a good thing for the client, for the community, and even for architects themselves.

But the reasons given for this antipathy will not always bear examination. It is sometimes said, for instance, that men work better

in the calm and serenity of a sure thing than under the anxiety and restraint of these contentions. But this is not always so. They certainly work more comfortably, for, as was said at the beginning, nothing is so uncomfortable as to work in the dark, as in competition work one is in great part obliged to do. But it is to be noticed that this is only a temporary evil, and so to speak, a superfluous one. It only defers more satisfactory relations; it does not replace them. When the competition is over, the way is clear to establish more intimate and more personal intercourse. The competition has done no harm. It is at most only a disagreeable episode. Many men, moreover, are so constituted that competition acts upon them as a stimulant, and many architects' best work is accordingly to be seen in buildings that have come to them in this way. This would, indeed, follow naturally from the fact that in their private practice there is, as has been said, hardly anything to prevent their giving a permanent form to any chance creation of their fancy, while in a competition their less happy inspirations never see the light. Thus even if competition does not always spur a man to do his best work, it at any rate effectually prevents him from doing his worst. No one can have much to do with competitions without being impressed by the fact that it would have been a public calamity if many of the rejected designs, even those sent in under notable names, had been carried into execution. But he also perceives that if the friend or patron who obtained for its author a place among the competitors had chanced to be a person of sufficient influence to secure his appointment outright, any one of them might have been selected and erected. Hence, an impartial and competent judge, or jury, is as important for the interests of the owners and of the public as for those of the competitors.

The objection that competitions interrupt the regular course of business, and that they involve a great expenditure of time and money, for which there is very little chance of receiving any equivalent, is better founded, in fact and in reason. But if, as can be done and has been done, the work asked for is restricted to sketches, these evils will, as has been said, for the most part, disappear. Less time is taken up and less money is spent; so little that the owners can afford to make ample requital. Whether they institute an open, closed, or mixed competition, the owners should always spend enough money upon it fully to compensate the competitors, or the chief part of them, for their actual pecuniary outlay.

These objections are also offset by the personal advantage which an architect gains by extending in this way the range of his business

acquaintance and professional experience. Even a large practice is apt to run in a narrow channel. Every architect would like to expatiate into untried fields, and thus not only to keep himself in training, but to prepare in advance for other kinds of work, should they ever come to him. But to make studies for a theatre, let us say, or for a large library, would take all his leisure for a twelve-month if he undertook it alone, and would cost more than he might care to spend if he employed his draughtsman upon it. A competition for such a building, however, will give him just what he is wanting, and at other people's expense, with the added advantage of having a real, instead of merely an academic, problem to practise his wits upon. More than one architect has owed his success in important work to the skill and courage acquired in such rehearsals.

The lessons that one draws from his own practical experience are indeed of more value than any such studies can be, since they teach what nothing else will. But practical experience keeps not only a dear school, as Poor Richard has said, but a slow one. Life is too short to learn everything in that way. Even in schools the "Laboratory Method" has but a limited application. It takes too much time. Most learning must needs be book-learning. So in architecture most things must be learned not by work, but by study. I think that an architect may well regard competitions in this light, as a sort of post-graduate schooling for the furthering and perfecting of his academic training, and that he need not be too anxious either to win the prize or to be paid for his labor.

The habit of taking part even in public and unpaid competitions is accordingly as helpful a one as a young architect can form, if he can afford to indulge it. It gives him an opportunity not only of enlarging his professional experience, but of keeping up and extending his studies. This consideration alone is a sufficient reason for encouraging the institution of open competitions for the classes of buildings to which they are adapted, for it is in the interests of the community that the younger men in any profession should have every opportunity of improving their professional status. In them lies the hope of the future. Everything should be done to make public competitions attractive to them, and this is an additional and a conclusive reason for requiring in such competitions only a moderate expenditure of time and money.

But though most architects dream of a time when there shall be a steady demand for all the work they can supply, so that they shall not be obliged to contend in this way for the chance of employment, it is to be noticed that even with many of the best patronized and busiest among them, their aversion to competitions is rather speculative

than actual, and that they willingly take part in them when the importance and the engaging character of the proposed work and proper rules for the conduct of the competition itself combine to attract them, and the pressure of other business does not hinder. It all simply comes to this, that architects very properly prefer to have business seek them instead of their having to seek it, and the uncertainties and disappointments that necessarily accompany competitions serve to intensify this preference. When a piece of work dawns upon his horizon an architect naturally hopes that it will come his way, and feels disappointed and somewhat aggrieved if he finds that his neighbors also are being consulted. Still he would rather take his chance with them than lose the opportunity altogether. It has thus sometimes happened that men who had been most conspicuous in decrying competitions in general have been the first to complain when important public work has been given out without their having a chance to take a hand and show how they would treat it. As soon as a new candle is lighted they flutter about it and forget that the longest wings are apt to get most badly singed.

Indeed, so uncertain and capricious is public favor, even towards the favorites of the public, that even the best-established houses cannot afford to neglect any legitimate occasion for enlarging their business connection, however much they might prefer to have things come to them unsought. Still less can the less fortunate and less known afford to neglect the opportunity which competitions offer to make a name or to advance their fortunes. It happens accordingly that in spite of all disclaimers there is always a sufficient number of desirable and trustworthy candidates for every competition that promises to be honestly and intelligently conducted. Indeed, plenty of men are always to be found fairly equipped with ability and character who do not wait for any assurances, either of intelligence or of honesty. Under these circumstances it would seem to be more seasonable and more reasonable for architects to recognize the advantages of the system and attempt to mitigate its evils, rather than to decry it altogether, in the vain hope altogether to do away with it.

Of the advantages to the profession which competitions offer, the opportunity which they thus afford for extending the range of an architect's personal experience, and for giving capable but little-known men the chance to show what they can do, is the most conspicuous. It is illustrated in the whole history and biography of the profession. This is also, of course, of equal advantage to the community. It widens the range of practicable and justifiable choice. Committees will gladly, as the result of a competition, employ practitioners whom it would have been unreasonable or improper for them

to take under their patronage in advance. The validity of this argument is attested by many notable examples. But it is naturally made light of by men who have already attained eminence, and a disposition to destroy the ladder by which one has himself climbed is too common and too natural a weakness to be made a matter of serious animadversion. People very properly wish to enjoy the fruits of their success without being disturbed at the repast.

Yet young men do not thus leap into fortune so often as is sometimes supposed, or as might perhaps be expected. At any rate, it seldom happens that the prize goes to incompetent hands. The fears sometimes expressed, that competitions will ruin the rising generation, whose heads will be turned by easily won successes, have little warrant in experience.

Competitions also tend to serve the profession by alleviating another disadvantage of the system of direct appointment; that is to say, of the system of personal patronage. Under this system, the architect must always be looking out for a patron, some one who will do him the favor to employ him, for this is the kind of work that naturally goes by favor. He is always haunted with the question how to secure his next job, a question which is a more serious one for the architect than for most men. For it is to be observed that an architect's emoluments always come in large parcels. His money comes, when it comes at all, not by fives and tens, as is largely the case with even the most prosperous lawyers and doctors, but by hundreds and thousands. To get or lose a single piece of work may make the difference between ease and penury for a year to come. In this strait the temptation to curry favor, to intrigue for patronage, to underbid the market, to regard every case as an exceptional one — and no two cases are exactly alike — so that slightly unprofessional conduct seems quite justifiable, is constantly before him. If, then, he has no special gifts for securing business, as is often the case with men admirably equipped for doing it, and if he has neither friends nor family to procure it for him, that is to say, if he has neither *push* nor *pull*, he may well find satisfaction in the system of competitions. It is a system which invites him into the open market, where he and his wares shall be judged upon their merits, and where, whether he disposes of them for a price or finds them left on his hands, he has nobody to thank or to complain of but himself.

It is often said that competitions are merely a device to bring matters to a practical issue, and that selecting the best design is only a roundabout way of selecting the best architect, or at any rate the

one who is the best for the purpose in hand. After that, it is said, matters should go on just as if he had been appointed in the first place without making any drawings at all, for that the real object at this stage of proceedings is not to secure a practicable design, which a competition is ill-calculated to furnish, but to secure a capable and trustworthy adviser, who should then by good rights begin *de novo*, under these more favorable circumstances for doing his best, and should be implicitly trusted.

But this is not really so. The successful design is not only a guarantee of its author's strength, but as has been said, it is a safeguard against his weaknesses. This might be illustrated by conspicuous examples where a change of site or some other alteration in the conditions has caused a premiated design to be set aside and an entirely new one to be made, with lamentable results. The first success is no guarantee of a second. Besides, a successful competitor is tempted to rest on his laurels. He is hardly likely to take up the problem a second time and give it a radically different treatment, when the first solution has once proved acceptable. The most that can be expected of him, except under compulsion, is that he will modify the details.

In attempting thus to hold the balance between the *pros* and *cons*, one is somewhat surprised to find the most weighty arguments all piling themselves up in the same scale. Competitions seem to be desirable for almost everybody. Besides the expense and delay, the main objections to them on the part of the owners seem to be that they restrict freedom of intercourse between the client and his architect in the early stages of the work, and that they tend to bring into his service, on merely technical grounds, a stranger whom he would not otherwise think of employing. These evils are real, but they can be greatly lightened. Experience has shown that they are largely offset by the better understanding of the work in hand, which a well-considered competition secures, and the greater range of choice in the selection both of an architect and of a design. To the community at large, competitions are an almost unmixed good, for they tend to bring into use all the talents that are at hand, and thus to improve the world in which the community has to live, while they bring to bear the only efficient restraint that seems to be practicable upon the vagaries and infelicities of architectural enterprise. It would be well if some equally efficient agency were at hand to prevent works of civil engineering from defacing and disfiguring both town and country.

To architects themselves they are seen to offer a legitimate opportunity for extending their business connections, increasing their

professional experience, continuing their disciplinary studies, and bringing their names into favorable notice, while they tend to release them from dependence upon personal patronage and from the temptation to intrigue for the chance of employment. The chief objection to them, from the architect's point of view, is that they expose men who are already successful to an unwelcome rivalry, thus, in a measure, depriving them of their legitimate reward, and that they necessarily involve a large amount of disappointment and vexation to the defeated competitors; that they disturb the ordinary course of business, and that the gambling element which often infects them, lowers the tone of the profession and involves a serious loss of time and money. But so far as these damages are not purely sentimental, they can be greatly diminished, if not entirely removed, by judicious forms of procedure, as has of late years been abundantly demonstrated.

It is customary, indeed, in the profession, to speak of competitions as a necessary evil, the only other opinion that finds frequent expression being that they are an unnecessary one. Yet a procedure that has survived for two or three thousand years must have some real adaptation to its environment, some great fitness to account for its survival. Without going so far as to say that "whatever is is right," one may still believe that no institution could have maintained itself so long unless it had a sufficient *raison d'être*, some valid justification, and met a real want. This consideration may be held to be a sufficient answer to the question which is sometimes somewhat querulously asked, why architects have to compete for employment any more than other professional men, lawyers, doctors, clergymen, or even civil engineers. It is really sufficient to reply that the very prevalence of the distinction shows that there must be some solid reason for it, since there is no effect without a sufficient cause.

What the reason is is another question. But it is a question that admits of an easy answer. Lawyers and doctors are not asked to show beforehand how they propose to treat the cases submitted to them, simply because it is, unfortunately for their clients and patients, impracticable to do so. If it were practicable for a lawyer to prepare his brief and try it on the judge and jury beforehand, so that his client would know whether the point he makes is a good one, and the precedents he quotes are really pertinent, there would be in every important trial a competition of lawyers to see who should be selected to conduct it. If in sickness or accident, it were practicable to try by experiment which medicine or which surgical treatment would work the best, the result would determine which

doctor should undertake the case, and all the High Priests of Æsculapius would be found contending for the honor and the fee. Among the clergy, indeed, this sort of trial is more possible. Men preach as candidates to see whether their style of sermon and their pattern of theology suit the tastes or prejudices of a congregation, and the congregation institute a sort of limited competition, inviting certain men of whom they have heard a good report to take turns in the pulpit. The ministers hate it, but there seems to be no other way, at least in the independent and democratic churches. Any sensible man will use every possible means of ascertaining and testing the quality of anything before he puts his money into it, and of securing to himself a choice among alternatives, if it is practicable to do so. The reason why doctors and lawyers are not chosen by competition is simply that it is not practicable, and the reason why architects are, is that it is, perfectly so.

In civil and mechanical engineering, also, competitions are not infrequently resorted to. Whenever it is a question of engineering design, and not, as in the general practice of that profession, merely a question of applying recognized methods to particular cases, the man is chosen who presents the best scheme.

Stephenson was thus preferred to Ericsson to build the first locomotive, a horizontal cylinder being judged better than a vertical one. In the appointment of civil engineers, it is becoming every day more usual to employ competition, especially in the case of bridges. The engineer of the Washington Bridge over the Harlem River, in New York, was chosen in this way, and the engineer of the new East River Bridge and the President of the Society of Civil Engineers did not consider it beneath their dignity to compete for the Connecticut Avenue Bridge in Washington. At this moment four eminent men of science are preparing designs in competition for the so-called Soldiers' Memorial Bridge over the Potomac. If it is said that bridges belong to architecture quite as much as to engineering, so that this proves nothing, one may answer that at least it shows this, that even engineers find competition necessary as soon as architecture begins to enter into their work.

It is also sometimes said that to ask architects to compete for employment is to put them on the same footing as the contractors. But this is palpably not the case. One contractor is preferred to another, after a comparison of their figures, purely as a matter of business. It is a mercantile transaction — a mere question of buying and selling. It is a Dutch auction, at which the lowest price carries the day. Now it is true that, in the practice of his many-sided calling, an architect needs many of the qualifications of a man of business,

as other professional men, and indeed most men, do. But it is not as a man of business that he is asked to compete. On the contrary, it is because he is also an artist. It is because their work is analagous to that of sculptors, not to that of stone-masons, that architects, like sculptors, have, in all ages and countries, been asked to show who could do the best work, before they were allowed to begin, and have not been permitted to waste their own time and other people's money, when, by a comparison of their ideas, the waste could so easily be prevented.

But even though one may believe that competitions have their legitimate place, it does not follow that he will wish to take part in them himself, any more than it follows, because one man does not care to take part in them, that other people should not. A physician may believe in vaccination and a lawyer may have proper respect for the criminal law, without caring in their own persons either to vaccinate children or to be counsel for thieves. It seems desirable that in laying down rules for the conduct of competitions, there should be more discrimination than is always shown between what men are ready to relinquish for themselves and what they shall forbid to others.

Granting then, what cannot well be denied, that competitions are sometimes desirable and are often unavoidable, it remains to consider by what methods they had best be conducted. There is some difference of opinion among architects on this point.

There is indeed a general agreement that Committees should employ professional assistance, since they need it at every step. They need this assistance first in examining the conditions of their problem and ascertaining its capabilities and its limitations, so that they may not ask for what is impossible and may get everything that the circumstances permit. These examinations will also clear their minds, enabling them to see just what they want, and to distinguish between what is necessary and what is only desirable. Secondly, they need assistance in the statement of these requirements, so that there shall be no ambiguity of language and no omissions. Complications also are likely to occur which do not readily suggest themselves to persons inexperienced in these matters and which may be the source of much embarrassment, if not provided for in advance. The programme should provide for every contingency. Finally, professional aid is needed in examining and choosing among the designs, not only because Committees often do not understand drawings very well, and need somebody to explain them, but because, though they may know whether their own taste and convenience are suited, they cannot in

general be competent judges of artistic and technical merit, and the interests of the work and of the public require that they should be well advised in these particulars. In these matters of taste also there is likely to be a difference of opinion among members of the Committee, and it is desirable that the men of sound opinions should be backed up. Moreover, competitors are naturally unwilling to submit such questions to the decision of an incompetent tribunal, and should not be asked to do so.

So far, there is little difference of opinion. But there is a considerable variety, both of opinion and of practice in details. How many the jury should consist of, whether it should be named by the Committee or by the competitors, and whether its decision shall be mandatory or only advisory, are questions which may well have different answers in different cases. Important public work may properly be managed somewhat differently from more private undertakings. In regard to the last point especially, the binding authority of an expert judgment, though the decision of a professional jury may in the case of a public building very well be final and conclusive, it is obviously proper that in more private enterprises the personal tastes and preferences of the proprietors should have freer play, and that the report of their professional advisers, while definitively rejecting the unworthy designs, should allow the owners to choose for themselves among the best. People naturally think that they should have some say as to what they will buy with their own money. Experience has shown that this rejection of the least good is a sufficient and effective bar to those evils of patronage, or at least of an unworthy patronage, to which such competitions are particularly exposed, while it protects the owners from a professional dictation which is especially unwelcome in private undertakings. Moreover, although there is a well-authenticated opinion that, in any problem, there is always one good solution, and that all the rest are of no account in comparison with it, in point of fact, it is not so. The difference in excellence among the three or four best designs is often so slight that the personal, and indeed arbitrary, preferences of the owners may properly turn the scales, even when practical considerations of convenience, of which the owners are often better judges than their advisers, do not afford still more legitimate grounds for a final choice. If, on the other hand, any design really has preëminence, it is easy for the jury to say so, thus exercising a moral compulsion which is equally effective and much more acceptable. It may be added that this procedure, in binding the owners to make their choice from a selected list, binds them not only to ask advice, but to take it, as the competitors have the right to require. If Committees proclaim that

they are going to ask professional advice, they are bound to give it due consideration. That is part of their contract with the competitors. But just how much should they be governed by it? It is generally a sufficient answer to this difficult question, if they agree to make their choice among those designs that have received a professional approval.

Besides, it is to be remembered that even a jury of architects is not infallible. A limited power of revision may well be reserved to their employers. It is an open question also whether Committees, as responsible agents, have a right to delegate the final choice to an irresponsible adviser. It is said that, as in the civil service, the most they can do is to obtain from him a certified list from which to choose. Indeed the Courts have held that in some cases even this is *ultra vires*.

A provision of this sort is of value not only to the competitors, as preventing favoritism among the Committee. It is of equal value to the Committee in relieving them of the suspicion of favoritism. Nothing can do this effectually except a provision which renders favoritism impossible.

The employment of professional advice at the beginning will afford reasonable security that in the instructions issued to the competitors the requirements will be clearly stated and that they shall be capable of performance. So far as possible, also, a distinction should be made, as has been said, between the things that are desired and recommended, but which a competitor may disregard if he thinks best and is willing to take the risk, and which the jury may waive, and those provisions which are absolutely essential, the neglect of which will cause the rejection of a design. The list of these more important items should be made as brief as possible, for it is in the interests of the work that the competitors should have as much freedom as circumstances shall permit. But it should include everything upon which the owners have really made up their minds or upon which they have invincible prejudices, lest the competitors should be led astray.

In any case the competitors should have the full benefit of all the preliminary study which the owners or their advisers have given to the problem, even to the extent of furnishing for their use any tentative plans that this study may have evolved.

To the list of requirements, the paper of instructions adds a list of the drawings to be furnished, giving their number and the scale and the style of draughtsmanship to be employed. Here again there is naturally and properly a variety of opinion and practice.

In an open competition, to which all who choose to come are invited, there is every reason, as has been said, for having the drawings

as few and simple as possible, for it is the interest of all parties that such a competition should cost as little as possible in time and money. Such a competition appeals primarily to the large class of young or little-known practitioners, and it relies for success upon bringing a large number of them into its service. But if they all, or a chief part of them, are to be paid for their work, this involves great expense, unless the sum given to each of them is small, and the work done must in that case be small in proportion. If they are not to be paid, no large number of competitors will present themselves unless the amount of work required is very small indeed, so that in either case, whether paid for or not, the work asked for in a general competition should be a minimum. How little will suffice, some recent experiments have shown, pencil-drawings on tracing-paper having been found to answer every purpose of comparison and selection. Indeed, the smaller the drawings the easier it is for the jury and for the committee to handle them and to understand them, and to bring together those that need to be brought into comparison.

But it is difficult to keep expenses down unless a very small scale is employed, each competitor being tempted to put in all the work the scale admits of lest the rest should do so. The recent example of the United States Government in asking for drawings at a sixteenth scale even for important buildings cannot be too highly commended for imitation. Limiting the scale of the drawings is all the more important in that it is not always practicable to limit their number. But no more should be asked for than are needed fairly to present the distinctive requirements of the programme. The choice always turns, and ought to turn in the first instance, on these points. For purposes of comparison, full sets of drawings are unnecessary, for the treatment of minor matters has, and ought to have, no influence on the decision. But drawings that are not to influence the decision are, at this stage of proceedings, superfluous, and should not be asked for.

But though such sketches suffice for the major part of a jury's task, which is a work of rejection, so that it is not difficult for them to narrow the choice to a few of the best, it may sometimes happen that they may not present these schemes with sufficient fulness to warrant a final choice among them. With this in view it is well to reserve the privilege of returning these drawings to their authors for further elaboration. If, then, new conditions have meanwhile arisen, or the proprietors have, as the result of the competition itself, obtained a better understanding of what they really want, so that they desire to modify the conditions, a second competition may sometimes be advantageously instituted among the authors of the most successful of the designs.

Such a procedure completely meets the objection often urged against a competition of sketches, that it compels the Committee to make a final choice without knowing what they are really going to get. This second competition may be conducted on a more ample scale without great expense. But though there are notable examples to the contrary, a double competition of this sort seems undesirable, unless the first trial is one of mere sketches. If the first drawings are elaborate, a second set made under substantially the same conditions will be likely to be virtually a mere repetition of the first, and not worth the trouble and delay they involve. But such more highly-finished drawings are needed only for the designs among which choice really lies, and there is a great economy in not requiring them from all the competitors at the outset.

The same considerations apply to the case of Mixed Competitions, as they are called, in which, in order to make sure of a sufficiency of trustworthy competitors, a certain number are specially invited and receive compensation, a general invitation to serve without pay being issued to the rest of the profession. Here also the work demanded should be a minimum, if any real advantage is to be had from this extension.

But in the case of a Closed Competition, among specially invited competitors, there would seem to be no reason why any amount of work should not be asked for which the nature of the problem may suggest and which the owners are willing to pay for. Yet even here it is well to avoid undue interruption of business and unnecessary disturbance of mind by keeping the work within moderate limits. In any case, however, it seems better to have all the competitors paid alike, rather than to have prizes of different values, and one of the advantages of diminishing the requirements to the utmost is that it may then be practicable to offer a considerable number of prizes which though small are large enough to meet the expense involved, so that even in an Open Competition all the best work, at least, may be properly paid for. Architects go into these contests not to make money out of prizes, but in the hope of getting the work to do, and ask neither for a reward of merit nor for a personal compliment, but only for a reimbursement of their expenses. These are presumably the same for all. Moreover, equal compensation puts all the defeated competitors upon the same footing, and nobody has to add to his disappointment the mortification of getting the lowest prize, sometimes a most unenviable distinction. Indeed, even a second prize seems sometimes only to signalize defeat.

Whether many or few, the drawings should be precisely enumerated and no extra or illustrative drawings should be admitted; otherwise

the award is likely to go not to the man who has done the best, but to the one who has made the most imposing show, and the longest or most reckless purse will win. Alternatives showing variations in the treatment of details should, I think, not be permitted at this stage of proceedings, unless asked for to illustrate alternative conditions. But competitors should be allowed, if they please, to present different designs embodying different ideas. It is the main object of the competition to obtain a number of schemes to choose from. Here again, if only sketches are asked for, the competitor may well afford to make more than one set. As to the style of rendering, it is more important that it should be the same in all the designs, so that no one of them may have any advantage by reason of draughtsmanship, than that it should be particularly good, or should do full justice to the author's idea. Exquisite draughtsmanship is a snare, deceiving both the architect and the jury. The best way to secure uniformity of style in the draughtsmanship is to furnish a print of some building illustrating the kind of drawing required.

Besides the necessary plans, elevations and sections, drawings in perspective, all made from the same point-of-view, are an invaluable auxiliary. The objection so often made, that such drawings are deceptive, and are calculated to beguile committees with fictitious effects of color and shadow, is obviated by making them in black-and-white, or merely in outline. They will still answer the principal service which a perspective can perform, and which nothing else will, that of showing the sky-line and the relations of the principal masses as they will really appear. As to unreal and factitious effects, nothing can well be more obnoxious to this objection than a drawing made in geometrical elevation, since it presents the building in an impossible aspect as seen from an inaccessible point, and its parts in factitious relations. Nothing could be more open to the reproach of misrepresentation than the conventional colors and exaggerated light and shade which carefully rendered elevations habitually present.

The other objection, that perspectives seldom honestly correspond to the elevations, but are usually "faked" so as to look right, refutes itself. It implies that an honest perspective showing the design as it would really appear, would look wrong; that is to say, that there are mistakes in the design which had escaped notice until the perspective revealed them. One of the chief advantages of putting buildings into perspective lies in the suggestions which thus arise for the improvement of the design. But of course this advantage is obtained only when the perspective is made under the architect's own eye.

The liberties taken by the professional aquarellist are likely to escape notice, and the improvements he makes are not detected.

The Paper of Instructions should, finally, be perfectly explicit in regard to business matters. In the first place, it should be made clear whether the promoters are acting in their own behalf or as agents, and in either case whether they have authority to proceed to build, and the language used should be such as to constitute a valid contract between them and the competitors. Assurance should also be given that the successful competitor shall be paid according to the schedule of charges approved by the American Institute of Architects. This is necessary not only to prevent any possible trading or underbidding on the part of other competitors, if such things can be, but to protect the successful competitor from haggling and beating down on the part of the owner. If any other scheme of payment is in contemplation, the fact should be explicitly stated in advance.

Assurance should also be given, wherever possible, that the successful competitor shall do the work. But this is not always practicable or reasonable. Even in Limited Competitions among invited competitors, it may happen that the Committee find themselves constrained to invite men in whom they have not perfect confidence and whom they do not wish to employ. This is of course a most undesirable state of affairs. But it sometimes exists, and when it does it should be frankly met by reserving to the owners the right to associate with the successful competitor some person acceptable to himself, with whom he shall divide the labor and the profits. This might seem to be so offensive a proposition as to deter men from taking a hand. But it does not prove so. The more experienced men feel quite sure that it does not point to them, and the men whom it does mean either withdraw, which does no harm, or are glad to take their chance under almost any conditions.

In an Open Competition, of course, such a provision is essential in order to protect the owners. Otherwise there is nothing to prevent any irresponsible person from hiring an equally irresponsible designer and a sufficient number of capable draughtsmen and carrying off the prize. But even in this case if the design is really the best one, it is for the interest of the work that the owners should be able to use it, under such provisions as safety may require, the author having his proper share of the credit and of the profit.

So, also, if there is anything in any of the rejected designs that would contribute to the perfecting of the contemplated work, it is proper both that the owner should have the benefit of the suggestion and that its author should have proper recognition. Here again there

is some difference of opinion and of usage. Committees are apt to think that designs for which they have paid something ought to belong to them to use as they will, and that this forms part of their bargain with the competitor. They do not understand that what they pay for is not the right to use it but the right to choose it. If they use it, or any part of it, they must pay in addition accordingly. But when the fee is large, it is sometimes provided that all the designs shall belong to the owner or proprietors to do as they please with, and of course nobody who accepts such conditions can complain if they are carried out. But most people will refuse to accept them unless the pay is very large indeed, and though a provision of this sort seems favorable to the owner, in fact it is not so. For the money spent in the large fees which alone make such a scheme practicable is for the most part thrown away. It seldom happens that different schemes can be incorporated into one. But minor details are sometimes adaptable, and it is customary to make provision for this contingency by a clause in the programme saying that "nothing in any of the rejected designs which is original as to this competition shall be used in the building without the consent of its author, and proper compensation being made to him." This seems perfectly fair, and it is of course an efficient safeguard against the fraudulent trick, said sometimes to be practised, by which a Committee adopts a design out of favoritism, and then fortifies it by adapting or adopting the best points of its rivals. But on the other hand, it puts it in the power of a disappointed and unscrupulous competitor to revenge himself for his disappointment by refusing the permission asked. This would bring on difficult and delicate questions of originality in authorship which however answered would be most embarrassing. I am disposed to think that the programme should stipulate in behalf of the owner for the right to employ any such features on making proper compensation; that is to say, the right not only to use the whole of one design, taking its author for his architect, but to use any part of any other. The owner institutes the competition in order to solve the various problems which the case presents, and it seems reasonable that he should profit by the solutions given to any of them, on making proper payment. If, as is generally the case, it is stipulated that the rejected designs shall not be shown to the successful competitor, this provision is hardly liable to abuse.

There is one case, however, in which uniting two designs in one is sometimes perfectly practicable. One of the many ill-considered dogmas which cloud the minds of architects, maxims lightly given out and lightly accepted, but without real basis in fact or in reason, is the saying that in the nature of things a good plan and a good elevation

must always go together, that a good arrangement of rooms suggests a good façade, and that an exterior composition is not a good one unless it suggests and corresponds to a good distribution within. Nothing could be further from the facts. It constantly happens, as everybody who has had to examine a series of competition drawings will testify, that these two kinds of merit may exist, and constantly do, in entire independence one of the other. It constantly happens that an admirable plan is accompanied by an intolerable elevation. It might have had a good one, but it doesn't. A noble exterior may be set up from a wretched plan. In this case the obvious thing to do, in the interest of all parties, is to roll the two into one, to couple the good plan with the good elevation, and then to arrange if possible that the two architects shall form a temporary partnership, *ad hoc*, and carry them both into execution. Personal antipathies and susceptibilities, of course, stand in the way of such a consummation, but from an architectural point of view, it is often perfectly feasible and reasonable.

When this case presents itself, that is to say, when such a combination will really effect the best solution of the problem, and yet the two architects in question cannot agree to work together, it ought to be practicable to have one of them act as architect of the building, and to have the other dispose of the right to use his ideas for a price. Which should do which would depend upon who was who. But in general, one may suppose that in spite of all that is said, and so justly said, of the paramount importance of the plan, the author of the elevation would be the architect. This would almost necessarily happen, for he would presumably be nearly as competent to execute the plan as its author, and if he could not do it himself, he could find assistants who would, while as to the elevation, the author of the plan would presumably be as incompetent to carry it out as he was unable to conceive it in the first place. In fact, of course, nobody except its author could carry it out successfully in detail.

Another open question is whether competition drawings should be signed or not. Here also there is some difference of opinion and practice. The question is, whether the merits of the designs and the merits of the designers shall be considered separately or together. I cannot help thinking that reason and experience are both in favor of considering these two things separately. They are totally different questions, and are best taken up one at a time. Whether men may safely be entrusted with the proposed work is a question which may often be considered in advance and the competition restricted to trustworthy persons. If this for any reason cannot be

done, then this question may well be left to the last, when personal considerations of age and experience may properly come in to turn a scale evenly balanced between two nearly equal schemes. This, moreover, restricts these somewhat awkward questions as to personal responsibility to two or three of the competitors.

It is sometimes considered advantageous that, before the decision is reached, the competitors should meet the committee to answer questions and make explanations. This can be secured, as it often is, by a phrase in the programme saying that the committee, if they find occasion to do so, will "open the envelopes containing the names of the competitors before they make a final decision, so that personal and business considerations may have due weight." In Open Competitions, a provision of this sort is, as has been said, absolutely necessary for the protection of the owners. But it is obviously in the interests of truth and justice, and equally to the advantage of the committee and of the competitors, and for the convenience of the jury, that in the first instance the study of the designs should be made without prejudice, and the task of investigation and selection be guided by their merits alone. This is also the only way in which the jury can themselves hope to render an unbiased and impartial verdict, or to be thought to have done so. Indeed, when juries have to deal with signed drawings, it is very much the custom with them, in order to protect themselves from cavil, and for the sake of their own peace of mind, to have the names covered up before their examination of the drawings begins.

It is true that competitors sometimes unite in asking permission to sign their drawings. But it may be surmised that this suggestion comes from the better known men, who naturally think that they ought to reap a legitimate advantage from their professional standing and reputation, and that the rest of the competitors acquiesce, with such grace as they can command, in what they feel to be prejudicial, but do not see their way to oppose. Something of the same sort may be said in regard to appearing personally before the committee. If they can do that, it is all that some men need want.

What the programme should say about the cost of a proposed building is another vexed question. My own impression is that it should say without reservation how much money the owners intend to spend, and should ask for approximate estimates on the basis of the designs submitted. These estimates had better be itemized, — so much for the building itself, so much for the foundations, so much for sculpture, decoration, heating, etc. If it is added that the owners "will not reject any design on account of its apparent cost,

without first giving its author an opportunity of justifying or modifying his figures," it seems to me that all interests are guarded, and the question of cost answered as nearly as it is practicable to answer it at this stage of the proceedings. Moreover, it is to be said that if the cost of the more variable items is thus subtracted, the cost of the structure alone will presumably be about the same per cubic foot for the different designs. It ought to be. At any rate, this figure is entirely within the control of the owner. He can build for fifteen cents a cubic foot, or for fifty, accordsng to the materials and style of construction and decoration that he prefers to adopt, and with the assistance of an experienced contractor, and of his professional advisers, he can satisfy himself as to the relative cost of the designs among which his choice is found to lie with as much precision as he cares for. The cost will indeed thus resolve itself into a question of the relative dimensions in cubic feet of the designs submitted, and the design which wastes least space will cost the least.

It is worth while to add that it is perfectly practicable in many cases to reduce the cost of a building, simply by applying a larger scale to the drawings. A shrinkage in lineal dimensions of one-eighth will reduce the cubic contents of a building nearly one-half, and the square feet, that is to say, the surface of the floors, roofs, walls and partitions, nearly a quarter. Rooms forty feet long will be reduced to thirty-five, and doors four feet wide to three and a half. Many designs, especially for the more monumental buildings, will suffer this reduction without palpable loss. This device has more than once been applied to competitive drawings with excellent results. Even a reduction in linear dimensions by one-sixteenth, which would hardly be noticed, setting, say, thirty feet in place of thirty-two, and three feet nine inches for four feet, will reduce the cubic contents by nearly twenty per cent and the square measures by nearly ten per cent.

These considerations do not, of course, touch upon the objections to competitions which are based upon the bad faith and unbusiness-like methods of building committees. But though it is not easy to overstate this evil in many cases, I think these cases are less common than is supposed and I am sure that it is an evil which can be greatly abated. I have generally found that when things were explained to them, committees were as punctilious as one could desire. In the twenty-five or thirty cases that have come under my own hand there have been only four in which the committees at all misbehaved themselves, and in each case some of the competitors were equally to blame, or even more so.

For the history of competitions shows that the unbusinesslike and discreditable performances with which this history is disfigured are by no means confined to building committees. The efforts on the part of competitors to obtain unfair advantages by means of superior and captivating draughtsmanship, by superfluous drawings, or by bringing personal influences to bear upon committee-men before the decision is made, and attempts to discredit the award afterwards by disputing the fairness or the competence of the committee, or of the jury whose verdict they have agreed to accept, in the hope of securing a more satisfactory finish by making a fresh start, are equally to be deplored. Still more so are the personal recriminations which occasionally come to one's ears, though happily they seldom come before the public, competitors roundly accusing each other, sometimes apparently not without reason, of unprofessional and dishonorable behavior.

But all these things belong to the domain of personal and professional morality, an important field, but a field which lies quite outside the ground covered by this paper. They relate to the standards of conduct in these matters which obtain in the community and in the profession, standards which are much lower than they might be. Business-men, when put upon Building Committees, sometimes seem to find it difficult, or to consider it unnecessary, to employ the business methods and the maxims of honorable dealing which in their private affairs they would never dream of disregarding. Architects are, as I have said, under unusual temptation to step over the narrow limits of scrupulous procedure. It is one of the main objects of this Institute to raise the tone of both. But it is not the object of this paper to offer any suggestions to this end. Its aim is, on the contrary, taking things as they are, to show that the evils resulting from such misconduct, misconduct which competitions have often seemed to invite, may be greatly discouraged by methods which shall afford little inducement and little occasion, on any one's part, for discreditable practices.

For a well-devised procedure will, in the hands of independent and competent persons, offer little opportunity for unfairness, either in committees or competitors, and keeping the number, size and style of execution down to a minimum will not only prevent waste of labor and money, but by limiting the amount of time and thought that can be put into the work, prevent the exalted hopes and cruel disappointments that are the chief bane of the system and which chiefly prompt men to intrigue.

What is here of prime importance is that measures should be taken to keep the expenses, whether large or small, strictly within the sums

paid to the competitors, thus shielding them from the temptation to spend more than they are to get, in the hope of capturing the prize. "But," it may be said, "if architects are foolish enough to throw away their time and money on a mere possibility, why is it any of other people's business to prevent them?" The answer is easy. Because it is gambling. The State makes laws to shield its citizens from this temptation and danger, and the constituted authorities of any profession may well take measures of like nature to secure a similar end. Competitions do not indeed, like cards and dice, enrich one man to another's loss, nor do they, like speculating in stocks, tempt men to ruin themselves by incurring obligations they cannot fulfil. But they tempt architects to expend upon them more than they can afford to lose, both of time and money, and they are disturbing and demoralizing just in proportion to the amount of anxiety they awaken.

These disadvantages cannot be entirely got rid of, since it is in the very nature of competitions to excite the imagination and to introduce into a business which is at best somewhat precarious an added measure of uncertainty. But to place one's dependence on uncertainties is as unbusinesslike as it is dangerous, for it is good business to count only upon what one is reasonably sure of, allowing such margins of safety that ill-luck can do no harm. An architect who allows competitions to play an engrossing part in his affairs is relying not on certainties, nor even on probabilities, but on possibilities, and on only one of them. The only real probability is failure, and the more time and thought and money he puts into them the greater the loss and chagrin he has to expect. If he is to avoid the ruinous risks and the unwholesome excitements and depressions of the gambler he must put into such work only a moderate amount of labor, and must learn to regard the result with an even mind, or, better, disregard it altogether. If then he has time on his hands, and there is either no pecuniary loss, or it is so small that he can bear it without a pang, he may well regard competitions as coming within the range of legitimate business enterprise. No harm can come of them. Even the hells of Homburg and Monte Carlo would lose their name if their votaries satisfied themselves with penny points. But in competitions this temperance is almost impossible if the requirements are at all exacting; that is to say, if anything more than sketches is asked for.

In whatever aspects, then, we regard competitions we come to the same conclusion. We find that their advantages are enhanced and their evils diminished if they are conducted modestly, the issues

presented made as simple as possible, the questions to be answered limited in range, and the work required to answer the questions reduced to a minimum. For the only issue a competition is well calculated to determine is that of the *parti*, the kind of thing it is best to do, the sort of building best suited to the case in hand. Questions of cost, material and construction, and personal questions as to the skill, experience and character of the competitors, cannot be answered by this procedure. They must be separately considered, as has been said, either before the competition is set on foot, or after it is concluded. But the main elements of the design, in plan and elevation, can be perfectly well settled in this way, and often more satisfactorily than in any other way. These questions, however, can be answered by sketches, any sketches, however small and simple, that will suffice to indicate the main elements of the scheme. How slight these may be has already been shown. Indeed, it is notorious. One constantly hears, after a decision has been reached by means of large and elaborate drawings, the result of endless labor and of expenditures which are never revealed, that the first sketch, made months before, exhibited all the qualities that finally won the triumph, that the original germ, so to speak, exhibited all the "promise and potency" of the final flower and fruit.

In thus passing in review the advantages and disadvantages of the system of competitions to the public, to clients and to the profession, it seems plain that the advantages are sufficiently real and important to account for and justify its continued existence. Since, then, we cannot reasonably expect to do away with competitions, and on the whole should not desire to, it is gratifying to find that with a little care and pains it is practicable materially to enhance their advantages and almost entirely to get rid of their most objectionable features. Experience has repeatedly shown that if in the first place the requirements of the problem in hand are carefully considered in advance, and clearly presented, and the final decision guided and in great part controlled by a competent and independent tribunal, and if in the second place the time and money to be spent upon them is no more than what is needed for an intelligent choice among the schemes presented, and this service is properly paid for, a procedure may be instituted to which no serious objection can be made, which can be undertaken without too much disturbing the ordinary course of business, and without too much disturbance of mind either before the award is made or after, and which ensures some notable advantages both to the public and to the profession which the system of personal patronage fails to secure.

Columbia University in the City of New York

SCHOOL OF ARCHITECTURE

THE SCHOOL OF ARCHITECTURE

ITS RESOURCES AND METHODS

Reprinted from the COLUMBIA UNIVERSITY QUARTERLY, June, 1900

THE INSTRUCTION IN PRACTICE

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THE SCHOOL OF ARCHITECTURE: ITS RESOURCES AND METHODS

WHILE in England and in France the schools of architecture are generally attached to schools of painting and sculpture, those in this country have generally been grafts upon schools of science. The necessary instruction in physics and chemistry, mathematics, mechanics and engineering being already provided, all that seemed necessary to equip a school of architecture was instruction in drawing and design. These branches were, in the school established at Cornell University in 1871 and that of the University of Illinois, founded in 1873, for many years somewhat under the sway of English traditions. But the little class which Mr. Richard Hunt started in the Studio Building in Tenth Street, when he returned from Paris in 1857, eager to hand on to others the lamps he had there lighted, he of course conducted after the manner of a Paris *atelier*. This class was the immediate parent of the school at the Institute of Technology, founded in 1865, and hence of our own, which dates from 1881. Both there and here, and wherever else schools of architecture have since arisen, the methods of the Paris school have been more or less precisely followed, and the actual instruction has been chiefly in the hands of its pupils or its pupils' pupils. To this instruction in science and in art the different schools have added the teaching of history, the modern languages, æsthetics, the auxiliary arts and the writing of English, in various proportions, with more or less of practical construction and office work, in anticipation of experience in actual affairs.*

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* Papers relating to this School have been printed from time to time as follows:

In the *School of Mines Quarterly*:—"The Instruction in Architecture in the School of Mines," Nov., 1888; "The Study of Architectural History," Nov., 1895; "The Study of Architectural Drawing," April and

But though the American schools of architecture are so far all very much alike, they differ considerably in the degree of importance they assign to these different subjects, in their methods of instruction, and perhaps still more in their equipment and in the more or less favorable circumstances of their environment.

The surroundings of our own school are obviously most fortunate. The most conspicuous feature among them is the city itself—a great museum of architecture, with full-sized models of almost every species of building, many of them of great excellence, and a very large number of them carefully based upon the best examples, in their details if not in their entirety. Those which are still in process of construction offer unprecedented opportunities for the study of the best modern practice. The Metropolitan Museum, just across the park, contains, besides its collections of painting and sculpture, innumerable examples of the applied and decorative arts auxiliary to architecture, while the Willard collection of architectural casts and models is, if not the largest, probably the best selected and the best arranged series in the world. The shops are full of the best modern paintings and of every species of artistic manufacture, displayed in their windows so that he who walks by may study them, and the annual exhibitions of the Architectural League illustrate the present condition of architectural design and the best practice in architectural drawing. Even within our own doors we have an invaluable equipment of drawings, photographs, books and prints that count by thousands, lantern-slides by the hundred, plaster-casts that cannot be duplicated, and a

July, 1896; "Professional Draughtsmen as Special Students," July, 1897; "The School of Architecture in its New Quarters," April, 1898.

In *Architecture and Building*, "The New Course in Architectural Engineering," August, 1897; and in the *American Architect*, "Perspective and Descriptive Geometry," April, 1898, and "An Address before the Architectural League," August, 1898.

Most of these papers have been printed for distribution and may be obtained at the School.

growing collection of building materials and appliances. Indeed, the buildings of the University themselves are not without their lessons.

It is something, too, to spend four years in a town where so many good architects are doing so much good work. Personally, they are hardly in evidence. But their near presence is not forgotten, and it gives dignity and importance to our undertakings. It is seen to be no light matter to be in training for such a career as theirs. Moreover, they are always glad to have our graduates in their service, and not only is this of ultimate advantage to our men, but the expectation of it is, meanwhile, a powerful incentive to self-improvement.

It is true that at present we are able but scantily to profit by this wealth of material lying just at our doors. Our time and our students' time is mainly taken up with the A B C of the art. We seldom, in point of fact, have to do with anything outside of our own walls. Given a few thousand dollars' worth of books, drawings and photographs, and what we do we could do just about as well any where else as at 116th Street. But the possibilities are boundless; and when the schools in less favored localities have succeeded in doing what we are now doing, we may hope to leave this work to them and advance to the enjoyment of our priceless inheritance. What we are now doing is no measure of what we are ready to undertake.

But already we are in the full fruition of one of our most valuable possessions. The Architectural Library, established by the munificence of Mr. and Mrs. S. P. Avery, in memory of their son, a young architect of most excellent promise, is one of the largest and best collections of such books anywhere to be found. Moreover, it is administered with a liberality and a consideration for the needs of students which more than double its value. In one respect it is believed to be unique among public libraries, in that it has attached to it a well equipped draught-

ing room, where students and visitors can work under conditions unprecedentedly favorable. Of this we and our students already make the utmost use, and find it of the greatest service.

What brings our men so much to the Avery Library is the unusual prominence we give to historical studies, and one reason why we give to these studies more time and attention than they receive in some other schools of architecture is that our men may make the acquaintance of books and acquire the habit of using them. But the chief reason is that it enables our students to enlarge their professional resources, as if by travel, and thus to escape the limitation of thought which so often shows itself in schools by an academic monotony and in the practice of the profession by poverty of ideas and a premature exhaustion of the imagination. To this end we not only give from three to five hours a week each year to stated lectures upon architectural history and ornament, taking up ancient history in the first year and mediæval and modern in the second and third, but we go so far as to interrupt the studies in design, which are our main concern, and for six or eight weeks in the spring substitute for them exercises in historical research, ransacking the library and the collections of prints and photographs, and making sketches and tracings, on a carefully prepared system, of plans, sections, elevations and details. By thus turning to the works of the masters, we hope to avoid the growth of a school style and that habit of copying one's own work which is a vice natural to schools of art. Wholesome traditions we hope to establish; but the process of breeding in and in, so to speak, by which each generation of students imitates the successes of its immediate predecessors, is a sure road to barrenness of invention and to the caprice and eccentricity which come in as the inevitable consequence of it. We find that the time thus taken from the practice of design is twice blessed. The work in design is itself promoted by the interruption.

A feature which distinguishes our methods from those of most institutions of learning, and is perhaps not elsewhere to be found, still further brings the Avery Library into the field of our activities. We have managed to concentrate almost all our stated instruction into the first three years of the course, leaving the fourth year almost entirely free from recitations and lectures. As there are, accordingly, few lessons to study or notes to write up, the evenings of the whole fourth year are left free for reading and writing, and the Avery Library is largely put in requisition for this work. Every student in the summer preceding his fourth year prepares a paper of five or six thousand words, by way of practice for what is to be a chief occupation of the winter. Then the eight months of winter evenings that follow are devoted to what we call our Advanced Architectural History, similar papers, longer or shorter, being prepared every month or six weeks until spring. These papers, beginning with the summer essays, are read before the class on Friday mornings throughout the year. They have proved to be, in general, entertaining and instructive; they open up fields for investigation that the stated courses of study necessarily leave on one side; and they afford excellent practice in collecting and arranging material and in putting the results into shape. For this literary work the weekly essays written during the two previous years, including those which accompany the work of historical research and the more elementary themes written during the first year, afford some preparation.

The whole of the daytime in the fourth year is thus set free for the practice of drawing and design, exercises which are so much interrupted in the previous years by other studies that hardly more than the bare elements can be mastered. But in the fourth year the whole day is given to work in the draughting-room, time which is of the greater value for being consecutive and free from interruption. Large and small problems alternate through the year; and at the end, in April and May, works of

considerable pretension are undertaken under the name of graduating theses. These are hung around the walls of the draughting-room through the following year, to be replaced in turn by the work of their successors. The variety of character exhibited in these drawings, the ultimate fruit of our endeavors, and the marked individuality of treatment which they not infrequently present, testify to the value of the historical studies upon which they are based. They often seem more like work from so many different offices than like the work of a single school, controlled and directed by the same personal influences.

Another feature which distinguishes our work from that of some of our neighbors is the special advantages that we offer to professional draughtsmen. But these have already been sufficiently set forth in another place.

In respect to the methods by which these ends are reached, we find ourselves, as we learn the lessons of our own experience, departing more and more in matters of detail from Paris traditions. This is what was to be expected—and, indeed, hoped for. The *École des Beaux-Arts* is indeed, our *fons et origo*, but the conditions are too different, there and here, for close imitation to be safe. In Paris the *nouveau* is thrown into the deep waters of the *atelier* to flounder as he may, with a dozen *anciens*, of greater or less degree of maturity, to teach him his strokes and to see that he does not hopelessly go under. By hook or by crook, he picks up a knowledge of what he needs to know, finding always somebody at hand who, in requital for such services as he can render, will answer all his questions as they arise. It is an admirable system, prompt and efficient, but it requires *anciens* to work it; and *anciens*—that is to say, skillful and experienced men—would not stay in school after they had become experienced, if they had not the *Grand Prix de Rome* to look forward to. But they would not even go to Rome, and there spend three or four of

the best years of their lives in further academic study, if they had not the promise of government patronage to look forward to on their return home. It is upon this government patronage that the whole Paris system rests. The *camaraderie* and mutual help that make the system of *atelier* instruction so delightfully efficient would be of little value without it, for the *anciens* would not stay long enough to get really old.

The Paris schools possess the further advantage that the best architects in France find leisure to take an active part in them, supplementing and completing the work of the *anciens*. This advantage cannot be had in this country. In a school like our own, all the instruction has to be given by two or three men—two or three teachers to eighty or a hundred students. The work must needs be done in classes, not man by man, and we must make up for this disadvantage by improving and perfecting our methods. For the purposes of class instruction the work has to be analyzed and systematized into a series of carefully graded exercises. In this we have made good progress and have already achieved excellent results. The more elementary work is done quite as well as it is done in Paris, and more promptly and surely. Even the more advanced work seems to be quite up to the Paris standard for work of the same grade, and considerably more uniform in excellence, as would naturally happen from the greater uniformity of the teaching. All this leads us to hope that, if the time ever comes when we can keep our men as long as the *ateliers* keep theirs,—or, which comes to the same thing, can begin our work with students already advanced,—it may equal also the more advanced work of the *École*. Meanwhile, the best thing our men can do, if they want to carry their schooling further, is to go to Paris; and that they do in large numbers, making for themselves there an excellent name.

But it is in the internal administration of the school that there is the greatest departure from the Paris tradi-

tions. For the last hundred years, at least,—that is to say, ever since Napoleon proclaimed the *carrière ouverte aux talents*,—the system of competition for place has pervaded French institutions. The *École des Beaux-Arts* is an admirable and efficient organism of tests and examinations, mentions, medals and all sorts of honors, calculated to stimulate its students to their utmost endeavor and to add the spur of emulation and personal distinction. For all this machinery the promise of government support to the man who wins in the race furnishes the motive power. The whole is so complete in every part, so smooth and effective in its workings, and the result so sure, that one is disposed to think that like effects can be produced only by like causes, and that the best anyone could do would be to profit by so brilliant an example and follow it point by point. But in this country such a course is impossible. The mainspring of government patronage is wanting; and, though one might fancy that, even so, the forces of rivalry and personal ambition would suffice to accomplish the same ends, it is doubtful whether even in Paris, where all the habits and traditions of society are in harmony with the system, the medals and mentions, even the *Prix de Rome* itself, would prove to have any lasting validity without it. It is not the piston or the driving-wheel that moves the train, not even the boiler behind them, but the coal hidden under the boiler. In this country, where the whole system of examinations and competitions and prizes is unfamiliar, uncongenial to our habits and in general distasteful, there would seem to be little chance of making it effectual, even if what experience of it we have had did not discourage the expectation. And, in fact, the present tendency seems to be the other way. The prizes for scholarship established by a previous generation have not worked as was expected; and the establishment of new prizes for school work is, in this locality at least, officially discouraged. The traditions and habits, as well as the underlying forces, that render this system so successful

abroad seem to be lacking here. Even in a *jardin d'acclimatation* it is not the exotics but the native varieties, sprung from the soil, that best flourish and grow. Different peoples have different ways, and in this country the ultimate energies that make the world go round reside not in the government but in private persons, and we rely upon personal interest to carry to an end what personal initiative has begun.

Moreover, the conditions which in Paris reduce to a minimum the disadvantages of the system are also lacking in this country and are not likely to be supplied. Gossip and scandal, charges of partisanship and undue influence among the judges, and of intrigue and bad faith among the competitors are, indeed, not unknown even in Paris. But these things need not be taken too seriously, for they are inseparable from the system. But the more offensive and obnoxious elements of personal jealousy and hostility are there largely eliminated by the fact that the rivalry and emulation in the School of Fine Arts is not between persons, so much as between different *ateliers*. This raises the whole tone. For private quarrel is substituted, as it were, a state of public war, with the dignity and responsibility and the freedom from personal feeling that common sacrifices in a common cause naturally involve. Between members of the same class in the same school there is no such protection from the baser passions.

Besides, after all, we must believe that even in France —in France, indeed, more than anywhere—the real motive power in all their splendid achievements is to be found, not in any external conditions or inducements whatever, neither in the hope of government employment nor in academic honors. The somewhat second-rate men who throng the government schools, in the hope of escaping military service, may very likely need these pricks and goads to keep them up to their work. But with the best of the Frenchmen, as with the large and brilliant company of American students who join their ranks, the motive

forces, as we must believe, are to be found within. It is the importance and interest of the subject and their own enthusiasm for it that animate the men at the top of the school and crown its work. So in England. The English may be a nation of shop-keepers, as Sam Adams called them, and the extraordinary prevalence of money prizes for every species of scholastic endeavor may seem to give evidence of a most mercenary spirit. But this is a mere national habit, a curious tradition; and one must believe that English culture and scholarship would be the same, if all the exhibitions and foundations were abolished, the English people being what they are. It is not these that achieve the result, but intellectual character and elevation of mind.

For our own part, at any rate, these are the lofty foundations on which we prefer to build; and so far we have found little occasion for serious misgivings and little inducement to change our policy. So long as the standard of performance seems to be steadily advancing, as it does year by year, we feel that there is no telling what degree of excellence may not be attained under these wholesome and elevating conditions in a stimulating and generous atmosphere. These are the influences that an architect must rely upon to carry him happily through the vexations and labors of a most exacting profession. These must be his permanent motives of conduct; and the sooner he is habituated to them the better. If his love and devotion are not of this fine quality, he had better do something else. If they are sufficient for these encounters, they will certainly suffice for the work of a school. Indeed, as William Morris has said, "The true incentive to useful and happy labor is and must be pleasure in the work itself;" and, whatever may be said against architecture as a practical calling and mode of earning one's living, as a study it is, for those qualified to pursue it at all, the most delightful in the world.

It is true that we thus lose the excitements and the picturesqueness of the arena, that the spectacle is less entertaining to lookers-on, that life is somewhat less amusing to ourselves, and that sometimes we have men—occasionally we have a whole class—who lapse into sloth and seem to need some artificial stimulant. But in many cases they presently recover their tone, and then we are rewarded for our faith in the *vis medicatrix naturæ*. Even where this fails—and we have to admit that our system is not without its victims—we are comforted by two considerations. The first is, that prizes and personal distinctions benefit at best only the men at the head of the class, and are likely to discourage those who from lack of early training, from immaturity or from some peculiarity of temper are beyond their reach. In any body of young men between the ages of eighteen and twenty-two there are many such; and hardly a year passes in which the slow development and final success of an unpromising student do not show us what injustice may be done by rating men, prematurely, according to their actual achievements. It is not the physical advantages of a steady hand, or even of a quick eye, that tell in the long run, but the mental qualities of good sense and good taste and a creative imagination. These are qualities that may presently develop themselves in a man whose fingers are all thumbs. It does not do to discourage such men at the start, by gazetting them at the foot of the list.

All this does not mean, however, that the difference between good and bad work is not recognized, or that the achievements of the dull or lazy are confounded with those of the more capable or more diligent. If the men are not weighed, their work is. The designs are not, indeed, marked as first or second in total merit; but they are analyzed and criticised before the class, so as to expose their strong points and their weak points, in planning, composition, detail and rendering. This seems more intelligent, as well as more just, than to say that one scheme is on the whole the best, in spite of its faults, and another

unworthy of mention, in spite of the skill and pains bestowed upon it. It is certainly more discriminating, more consonant with the purposes of a school and more helpful to the scholars. In these judgments we often avail ourselves of the friendly services which the architects in the town are always ready to offer.

Nor does it mean that our men are without the spur of personal ambition and of the emulation which is kindled by admiration of their betters. But an eager desire to do as well as the best is one thing; wanting to win a momentary fame by beating them on the mark-list is quite another. Nor are they without the stimulus and encouragement that come from the hearty recognition and appreciation of success. But they escape the depressing influence of formal comparisons and official depreciation. As one of them was heard to say to a visitor, some years ago, "The best thing about this school is that one man is as good as another." Moreover, they escape also the duplicity of purpose which tends so greatly to impair the sincerity of work done with two ends in view. As another of our men, and one of the best of them, once said, in speaking of the graduating theses, "The most satisfactory thing about them was that we knew they weren't going to be judged. We felt perfectly free to do what we really thought was best, without having to consider what the jury would probably think."

The other reason for keeping on as long as we can in our present way is that we are thus exempted from the personal jealousies and antagonisms which, as may be seen even in the army and navy, a system of rank and promotion can hardly escape. As it is, our society seems eminently free from these disturbing influences, and we are naturally slow to accept a policy that might bring a cloud or storm into the serenity of our skies.

In all this we are glad to feel that we have the loyal and cordial support of our own graduates, and that those among them who are most earnest in urging us to keep to our own ways, and not to budge, are those who have had

most experience of the *École des Beaux-Arts* and are most grateful for the service it has done them.

But these considerations apply only while the men are in school. When once they are out and on their own feet, it is a wholesome exercise, during the next six or eight years, for them to test their strength and prowess against each other. For this the travelling fellowships, endowed by Mr. McKim and by Mr. Perkins, and established by the Trustees themselves in recognition of Mr. Schermerhorn's liberality, afford an excellent field. We refused these endowments for the men still under pupilage, saying that we did not believe in prizes for school work and that our men had no time while in school to spend upon prize work. But for our graduates they are an unmixed good. The men who win obtain a great benefit, and the men who lose have an opportunity for graduate study, on the lines of their school work, which they highly prize.

This result of these endowments is perhaps quite as beneficial as the other. They are open to all graduates of the school under thirty years of age; and every year ten or fifteen men, sometimes more, occupy the leisure of two or three months in the study and execution of the required drawings. Among them are always some who are pursuing their studies in the *École des Beaux-Arts;* and it is gratifying to find that neither in the arrangement of the plans, in the composition of the elevations, nor in the execution of the drawings, do these designs show any obvious superiority over those made in this country. This encourages us to believe that, if we were able to maintain a graduate course or—which comes to the same thing, as has been said—to advance by a year or two our requirements for admission, so as to make the most of our environment, we should be able to do work of a more advanced character as efficiently as we now do what we now undertake.

The work done by the holders of these travelling fellowships while abroad is adjusted rather to further each

man's personal needs than to achieve notable results. When it comes home, it exhibits every variety of performance, from notes and sketches of travel to measured drawings, or *projets* made in the *École des Beaux-Arts* or some of its preparatory schools. This freedom is characteristic of our policy, even within the lines of our school work. While the tasks we prescribe, whether in drawing or in design, in historical research or in the writing of essays, are defined by strict limitations, within that range we encourage the greatest possible variety. In this way we not only foster independence and individuality, but manage to keep men of very different calibre at work in the same field, without over-taxing the weak or holding back the swift-footed.

The year always ends with the exhibition of the total work of the school, and the work done abroad by the holders of the fellowships serves as a most attractive side-show. We put up all the work, that of the worst performers as well as that of the best. This we do, not only because it is quite in harmony with our general policy of avoiding personal distinctions, but because we are really quite as proud of the poor work as of the good. Any class may be trusted to have a few exceptionally bright men who will do us and themselves great credit. But this credit belongs mainly to them. The most that we can pretend is that the honors are even. The successes achieved at the other end of the class, however, we feel to be mainly our own; and when it happens, as it sometimes does, that it is not easy at first glance to tell the good work from the poor—when visitors ask us, as they sometimes do, what sort of work the incapables do, and we answer that it is before them, then we feel very much gratified. It bears testimony to the efficiency of our discipline. But this happens only in the earlier years, the years of training. Before these are through with, the best men are well ahead.

These are the favorable conditions under which our work is done, and these are the ideas and ideals by which

it is inspired. We are enrolled among the Schools of Applied Science; but this is rather a tradition from an earlier age than a just expression of present conditions; for, though we avail ourselves of their neighborly offices to gain for our students in architectural engineering advantages not elsewhere to be had we are almost as independent of them as is the College. We are, indeed, in spirit really more akin to the College than to them, in spite of our claim to be a professional school and not an undergraduate school, and of our refusal to look upon our students in the light of sophomores and freshmen. Architecture is, in its many-sidedness and in the generosity of its aims, much of the nature of a liberal study, and we are disposed, so far as may be, to have it altogether such. It is this attitude and temper on our part which most makes our men value the time they spend with us, and it is this, perhaps, which most differentiates this school from those in which, as in the *École des Beaux-Arts*, men are regarded chiefly as designers, and resembles it to those which regard their students as, first of all, men.

The annual exhibition opens with an annual *Banquet*, a modest repast to which the graduates of the School flock in large numbers, and at which the graduating class are always present as guests, so that they may take their place in the company of their predecessors. These gatherings notably accentuate the personal and friendly relations, the establishment and furtherance of which is one of the best results that such schools can attain.

WILLIAM R. WARE

THE COURSE IN ARCHITECTURAL PRACTICE.

It is an open question how prominent a part the practical side of the profession should occupy in the curriculum of a professional school. That it is easier to acquire theoretical knowledge within the walls of a schoolroom and practical knowledge outside, is not a sufficient reason for neglecting practice altogether. Almost all schools recognize this and include more or less of practice in their courses. Thus engineering schools have summer classes in surveying, mining and shop work; law schools have their mock trials and medical schools their clinics and laboratories. In schools of Architecture, also, though it is their first duty to teach what cannot be learned elsewhere, giving themselves mainly to History and Design and to Scientific Construction and leaving Practical Construction to be learned in offices, it is well not to neglect office work entirely. The simultaneous study of Architectural Practice gives to the work in Architectural Engineering much seasonable illustration. It is well also for a student to make a survey of the whole field of office work before taking it up in detail, and such a survey is more practicable in a school than in an office. It is of the nature of school work. Some schools include in such instruction the arts of the carpenter, mason and plumber, but shop-work takes more time than we can ourselves spare from more profitable things, and our own course in Architectural practice is confined to lectures, with illustrative exercises. Our students find that this suffices to save them six months' time when they come to study these things in the office themselves.

The practice of Architecture comprises the preparation of the working drawings and the superintendence of the various operations and processes by which these are carried into execution. The preparation of the drawings and specifications demands familiarity with the prevailing forms of construction and with the nomenclature and character of the multitudinous objects of carpentry, masonry, plumbing, painting, glazing, hardware, etc. The superintendence of a building in process of erection requires, furthermore, acquaintance with the names and properties of all sorts of building materials and apparatus, and with the methods for testing

them: a kind of knowledge which, while covering the same ground with that of the specifications, is quite distinct in character. We have accordingly two distinct courses of lectures: one on Specifications and the other on Building Materials and Superintendence.

It is the object of the course in Specifications to familiarize the students with the ordinary forms of contracts and specifications, with various details of construction, and with general office management. A model specification has been prepared which embraces all of the particulars likely to occur in different kinds of buildings. It has been compiled from the best attainable specifications of private dwellings, churches, hospitals, warehouses, public buildings, etc., the architects of which have kindly put their specifications at our disposal for the purpose. It thus embodies the experience of many years in active professional work. This specification is read and explained to the class and the details of construction which it calls for are illustrated by diagrams and by copies of working drawings. The diagrams, like the specification, cover the whole field of building operations. They are nearly two hundred in number, and illustrate not merely details of construction, but various building operations such as shoring, underpinning and pile driving. This specification has been printed and it is distributed to the class, a page or two at a time, before each lecture. The students are required to copy it in a special book, to take notes of the explanations and to make sketches of the diagrams, the alternate pages of the Specification Book being left blank for future additions. The more important diagrams have been reduced to convenient size and are also printed and distributed. A page of the model specification and reproductions of some of the diagrams are given at the end of this paper.

The lectures on Specifications treat, first, of the general law of contracts and the various forms of contracts in use; the different ways of preparing plans and specifications for estimates; and the instructions to bidders, the rules to be observed in writing specifications and the proper form for the general clauses; secondly, of the specific clauses illustrating the various details of construction. These clauses are grouped under the heads of Carpentry, Masonry,

Structural Steel and Iron Work and the Plumbing and Drainage of Buildings.

I. Under the head of Carpentry are explained the ordinary methods of framing and the advantages and disadvantages of each, the preparation of framing plans and elevations and the details of all of the joints and connections. These lectures are further illustrated by diagrams, working drawings and models. A model of a regular mortise and tenon frame, one-eighth full size, but complete to such small details as hard wood pins, joints and bridle irons, is built up before the class so that they see not merely the completed frame, but the process of putting it together. Full-size models are shown of all the principal joints and connections. The framing of roofs is then taken up in the same way. After this the minor details of carpentry, sheathing, flooring, outside and inside finish, and the construction of doors, windows and frames are specified and explained.

The subject of slow burning or mill construction follows and is illustrated by lantern slides showing factory buildings at different stages in the development of the system, and also by diagrams, working drawings and models. The models are all one-eighth full size and show the general lay-out of factories and mills and the details of their construction. One of them was made under the direction of the president of the Boston Manufacturers Mutual Fire Insurance Company and illustrates the methods recommended by that company. The application of the principles of slow burning construction to domestic architecture is also explained. The last lectures given under the head of Carpentry are devoted to the various kinds of roofing employed, shingles, slates, tiles, tin, etc.

In order to make the present methods of building more fully understood, the history of each operation is gone over whenever possible. The mediæval methods of framing, for instance, are first explained and their influence upon the earlier colonial frames is traced. Then the evolution of mortise and tenon framing is shown and finally of balloon framing. A comparison between the methods in vogue in different countries and in different sections of this country is made whenever practicable.

II. Under the head of Masonry are included, first, the preliminary operations of surveying, excavating and draining, sheet

piling, shoring and underpinning; secondly, foundations: stone, brick and concrete footings, inverted arches, I beam grillage, piles and pneumatic caissons, in illustration of which there has been made a large collection of plans of the foundations of notable buildings, such as the St. Paul, Havemeyer, New York Life, American Tract Society and others; thirdly, the superstructure: rubble stone, brick and cut stone walls and piers, chimneys, etc. Cut stone masonry is illustrated by specimens of stone showing all of the facings in use and also the implements for making them. Finally, plastering, fireproofing and the use of terra cotta complete the list of building operations taken up under this head.

III. The specification for Structural Iron and Steel Work includes the entire subject of modern steel skeleton construction. This subject is so modern a one that most of the information in regard to it is to be found only in the technical journals and the methods are so continually changing that since this course was first given it has already had to be twice rewritten in order to keep up with the times.

This specification begins with the preliminary mill operations of punching, drilling, reaming, assembling, bolting and riveting. Then come the details of construction, such as the various forms of bases, cast iron and built-up columns, column connections, beams, girders and lintels, framing, connections and wind bracing. The advantages and disadvantages of each form of column and connection are explained, and full size sections of built-up columns and models of connections are shown.

IV. The final lectures are devoted to the Plumbing and Drainage of Buildings and to the different methods of disposing of household refuse. The requirements of the New York City Board of Health are taken as the basis of this specification and it is illustrated by a model showing the plumbing of an ordinary city house. Next winter additional lectures will be given on the ventilation of various kinds of buildings, private houses, schools, theatres, hospitals and public buildings, and also upon heating by the hot air, hot water and steam systems.

Besides the lectures on Specifications, every other Thursday throughout both terms of the third year is occupied in working

out a practical problem in construction and making the ordinary detail drawings for wood, stone, brick and iron work and the plans and elevations of a system of plumbing. These drawings are made just as they would be in practice, and the experience the students gain from them is such that upon entering an office they are able to make without much difficulty any ordinary detail. They are, therefore, able to begin as draughtsmen and not as students or office boys.

This course in Specifications sufficed to show how the various materials used in building are employed. It remained to organize a course upon the materials themselves. To be sure, lectures in hygiene, sanitary engineering, chemistry, physics, botany, and geology, had in earlier years supplied some of this information but it was not taken up from an architect's standpoint. For the last three years accordingly these lectures have been replaced by a course in Building Materials, and those on hygiene and sanitary engineering by the lectures on plumbing, heating and ventilating already mentioned.

The lectures in Building Materials treat of the history, geology, botany, chemistry, physics, methods of manufacture, tests and uses of the materials mentioned in the specification, and they are illustrated by samples of lime, iron, clay, etc., in various stages of manufacture and also by models and diagrams of furnaces, kilns, etc.

These lectures like those in Specifications, are now given twice a week during the third year. They also are grouped under the head of Carpentry, Masonry, and Iron and Steel Work, and are so arranged that they accompany those in Specifications, subject by subject. When for example brickwork is taken up in the course in Specifications, the manufacture of bricks and the tests to be applied to them are explained in the lectures on Building Materials.

I. Under the head of Carpentry the various kinds of woods are treated; their botanical character, growth, preservation, decay, method of cutting and seasoning, the classification, grading and testing of lumber, and the manner of specifying the different grades. The structure of wood, the phenomena of shrinkage, the recognized defects in different kinds of timber and their various economic uses are also taken up. Finally a "key" is explained

by which it is possible to identify with exactness the various species of wood. This key, which is one of the publications of the United States Department of Agriculture, is based upon the invariable differences in the structure of the different woods. The usual botanical distinctions are useless for architects and engineers as they seldom see anything but the dressed lumber, stripped of its leaves, blossoms and bark. They need therefore to learn to recognize lumber from its structure as shown in the different sections. To illustrate this, lantern slides of the cross sections highly magnified are thrown upon a screen and a set of Hough's Wood Sections of the Native American Woods, and samples brought from the lumber yards, are shown to the class. At the end of the lectures each student is provided with a sample of every kind of wood shown and is required to identify it, just as if it were a mineralogical specimen. This has now been tried long enough to show that the results are very satisfactory.

II. Under the head of Masonry come the soils, their bearing power, methods of determining it, etc.; then the building sands and limes, cements, mortars and concrete. In addition to the physics, chemistry and methods of manufacture, tests of the quality of limes and cements are performed before the class. The tests of cement are made in the laboratory of the Department of Mechanical Engineering. They are those recommended by the American Society of Civil Engineers and include tests for tensile strength, time of setting, hardness, soundness and fineness of grinding. After this follow the various kinds of building stones, bricks and terra cotta, and the soft-mud and stiff-mud methods of manufacturing bricks, and the tests to be applied, are also explained. Plaster and asphaltum complete the list of building materials mentioned in the masonry specification.

III. The materials treated under the head of Steel and Iron Work are cast iron, wrought iron and steel. The different ores used for their production, and the operation of a blast furnace are explained Especial attention is given to the tests of the materials, the different methods of manufacture and the influence of these methods upon the character and quality of the product. The lectures furthermore include the operation of making castings, the contingencies which may arise in their manufacture and the tests to which all

castings should be subjected; also the operation of rolling out the various wrought-iron and steel sections.

Saturday mornings are from time to time employed in the inspection of buildings in process of erection and of various shops, such as rolling mills, brickyards, foundries, etc.

A museum of building materials, appliances and models has already grown to considerable size. It contains a large number of models of wooden and steel construction, samples of bricks, terra cotta, stones, hardware and of nearly every other material mentioned in the specification. The specimens of terra cotta arches and fireproofing formed part of an exhibit at the Chicago World's Fair and were presented to the school by the exhibitors. The collection of native American woods is especially complete, including all the common species used in building and many of the rarer ones. A part of this equipment has been obtained by purchase, but the greater portion has been contributed by the generosity of manufacturers and dealers in this city.

The course in Architectural Practice is complementary to the course in Architectural Engineering and the two are so arranged that the same subjects are treated at the same time. Thus lectures in Architectural Engineering on the strength of rivets and the supporting power of columns, occur at the same time as the lectures in Architectural Practice on punching and drilling, the different methods of riveting and the variou forms of built up columns. The practical work in both courses is also complementary; one Thursday for example, the problem will be the calculation for a riveted girder, and on the following Thursday the problem will be the making of a working drawing for the same girder. All this practical work is moreover complementary to the Third Year problems in design. If, for example, the problem in design is a country house, a city house or a library, the practical problems are, a framing plan and elevation of the country house, ¼ inch scale working drawings of the city house or the calculations for some of the arches, trusses or girders in the library.

These courses in Practice and Engineering cover the entire field of Architectural construction and may be taken independently of the other work in the School. Although they are intended primarily for students of architecture, parts of them at least might be taken with advantage by draughtsmen and superintendents in architects' offices, by builders, or indeed by anyone interested in building. Those who are qualified to pursue them may enter the School as special students and select for study whatever subjects they care to. An article on "Professional Draughtsmen as Special Students in the School of Architecture," published originally in the QUARTERLY for July, 1897, has been reprinted for the School of Architecture, and copies of it may be obtained upon application to the Bursar.

CHARLES P. WARREN.

Specimen page of Model Specification.

Expressions in italics may be changed. Expressions in parentheses ( ) may be omitted and those in brackets [ ] substituted instead, preference always being given to the first.
Numbers on margin refer to construction plates.
All sizes and dimensions are approximate and absolute.
*, †, ‡ are explained at bottom of page.

MASON 1.

NOTE. All of the general conditions prefacing this specification, except (§) apply to the execution of all works described under this heading.

PLATFORM AND BRIDGE PLATES 1 AND 2 M. *Before any work on the present site is begun,* the Contractor must erect *along the street front* a *yellow pine* platform and bridge, *ten* feet wide and *fourteen* feet high.

PLATFORM.
1
2 The uprights are to be 12″ x 12″, set *eight* feet on centres; the plates 12″ x 14″, and the sills (12″ x 12″) [6″ x 12″ securely bolted to both sides of uprights]; all are to be well bolted together and braced at all angles by 2″ x 6″ planks securely spiked.

The floor of the platform is to be made of 4″ x 12″ planks laid flatwise and well spiked to 10″ x 12″ cross timbers set *four* feet apart and well spiked to the plates.

BRIDGE.
2
1 The bridge * (under the platform) is to be made of 3″ x 12″ planks laid flatwise and well spiked to (6″ x 12″ sills) [to 6″ x 8″ cross timbers set *four* feet apart and spiked to sills] † (and provided with necessary supports properly braced); construct suitable steps at each end, and a strong handrail along the outside of steps and bridge, all to be well braced, bolted and fastened.

Over the bridge provide and put up a roof of 2″ x 9″ planks laid double with a 12″ pitch, and well nailed to necessary supports * (spiked to uprights) † (properly braced.)

* Insert when bridge is built under platform as shown in Plates 1 and 2.
† " " " " " without a platform.

PLATE 15,I.

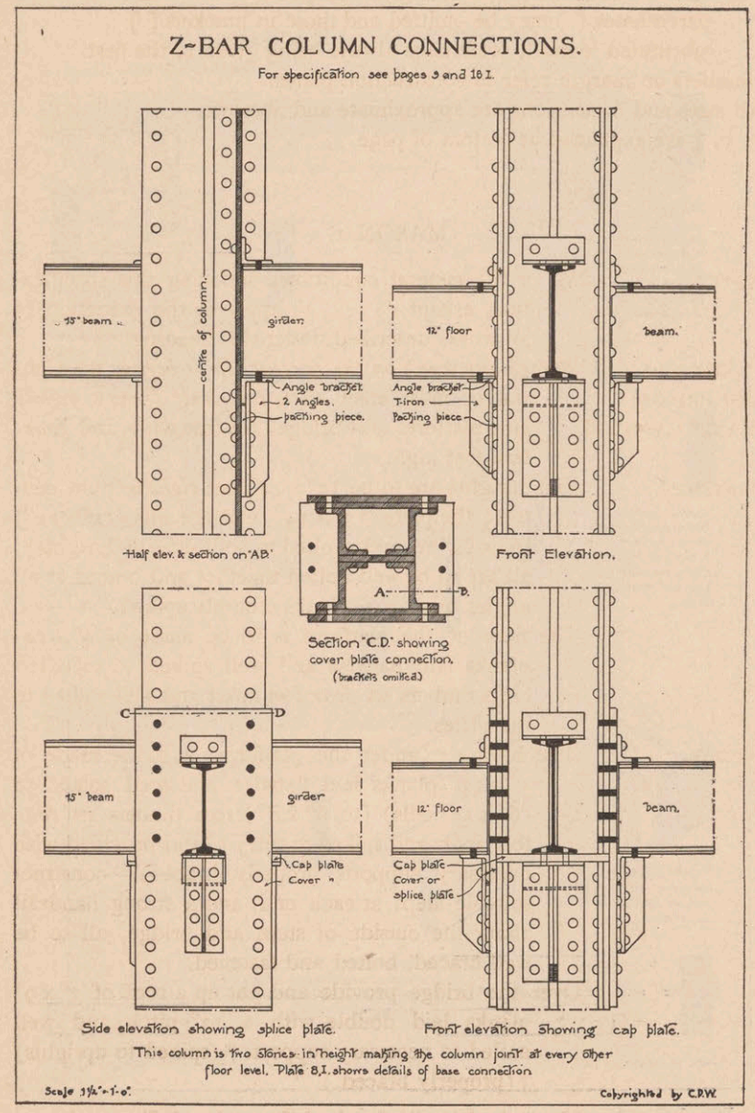


PLATE 14 C.

DETAILS OF FRAMING

Specified on pages 7 and 8 of the Carpenters Specification.

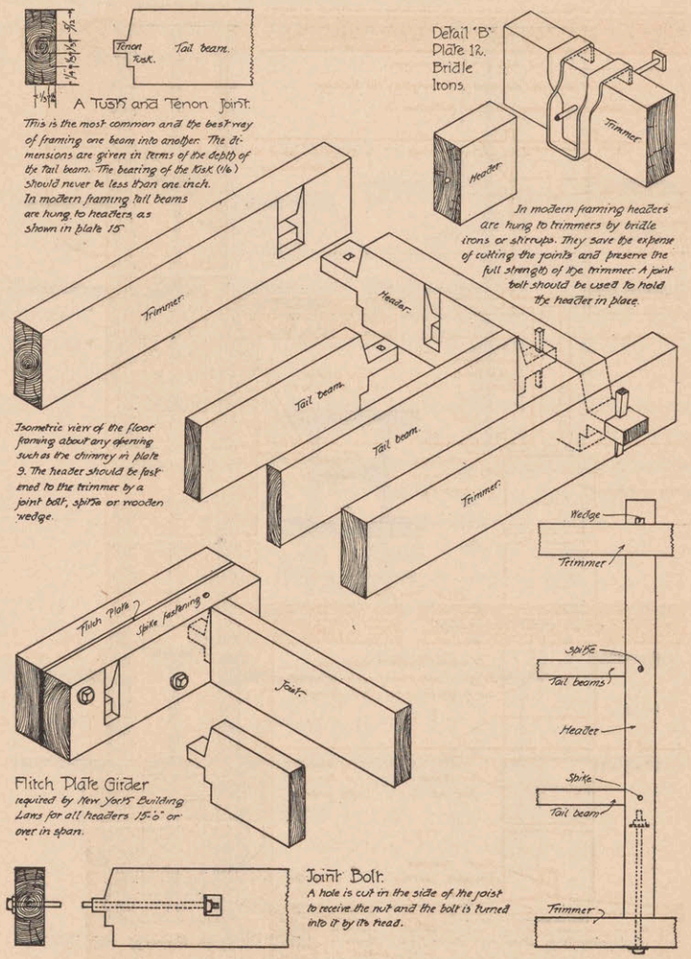


PLATE 3 S.

ANCHORS, CAPS, HANGERS, ETC.,

characteristic of "slow burning" construction. They are specified on pages 11-3 of the structural iron specification.

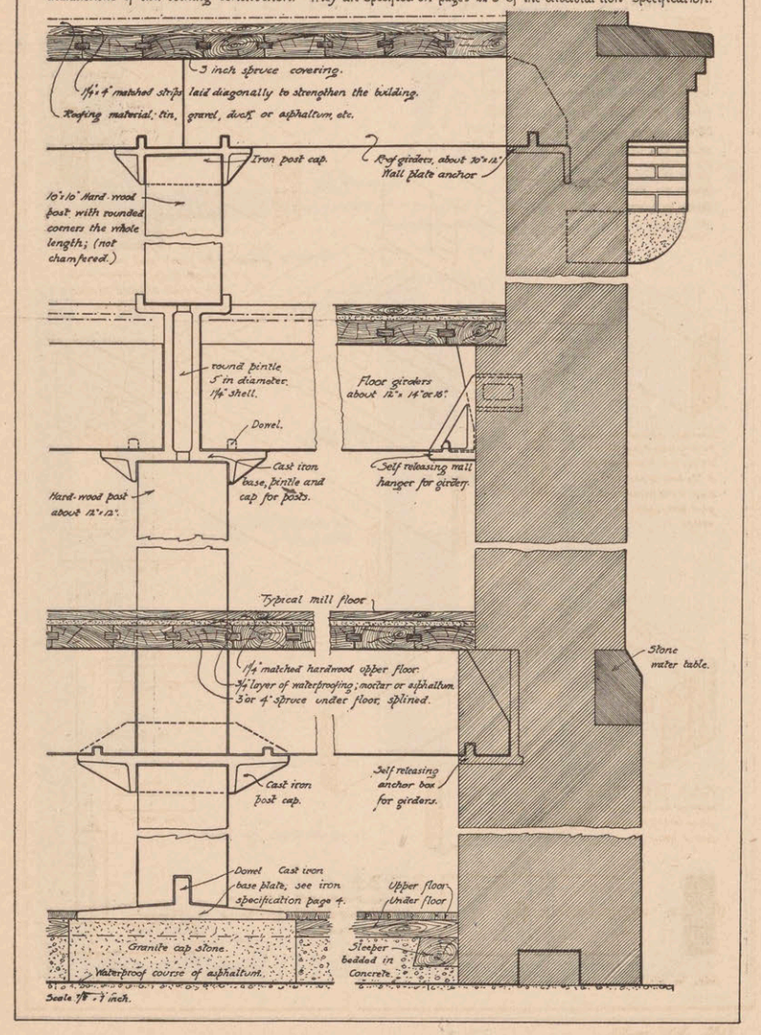
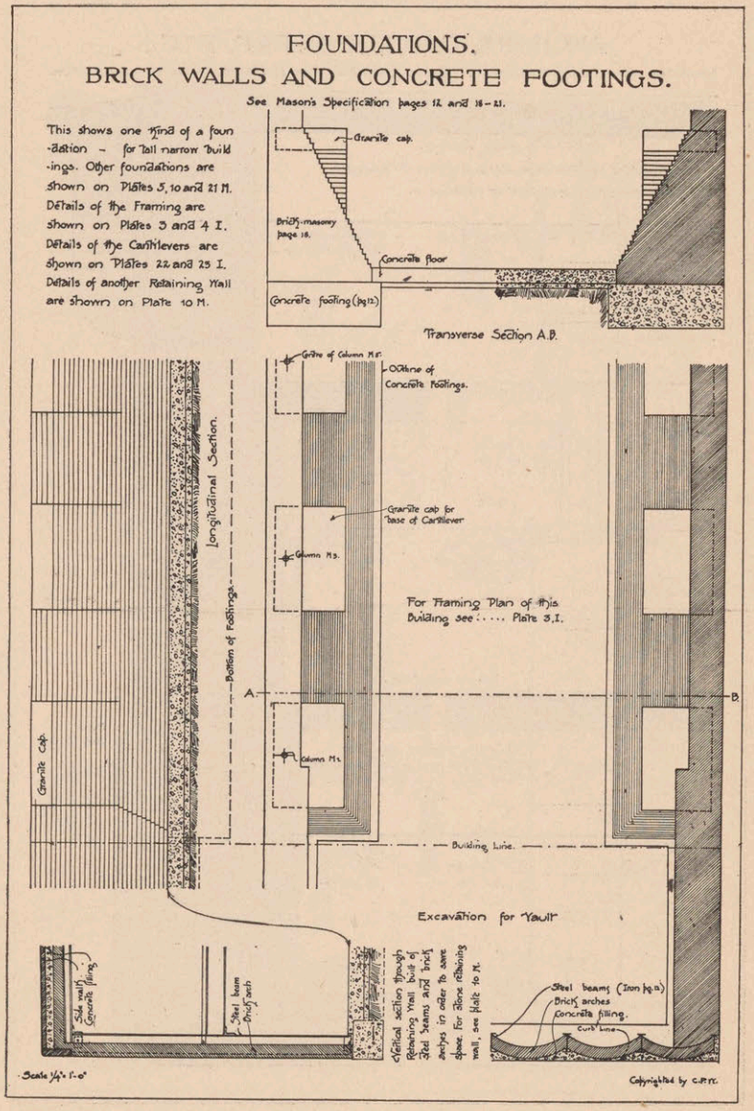


PLATE 11M.

FOUNDATIONS.
BRICK WALLS AND CONCRETE FOOTINGS.



DRAWING, DESIGNING AND THINKING

WILLIAM R. WARE

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Act of Congress of March 3, 1879.

Drawing, Designing, and Thinking.

It is the purpose of a course in design, in a school of architecture, or elsewhere, to make its students acquainted with the means by which, when they come to the practice of their profession, they may produce buildings marked both by good sense and by good taste. The means at command are, first, acquaintance with the forms which experience has approved, both those derived from materials and methods of construction, and those suggested either by geometry or by other arts and manufactures, or occurring in nature; secondly, familiarity with the ways of combining these forms which reason and experience have found to be most effective; thirdly, exercises in draughtsmanship, by which, as in a laboratory, building operations may be simulated on a small scale, and a profitable experience gained. This covers practice, theory and history—all three.

The advantages of such methods are plain, and are so conspicuous that one is apt to overlook the dangers which necessarily accompany them, whether they are pursued in schools or in offices where, in the practice of design, the methods of the schools are more or less closely followed.

First, as to draughtsmanship.

This is the art of representing the appearances of things, their forms and their colors. It is the art of the painter. It is an independent branch of the fine arts and ranks with sculpture and architecture in dignity. The picture that results, and which it is the aim of this art to produce, is an end in itself, and has an intrinsic value and importance. The chief danger to which the architect or the student of architecture is exposed, when he employs this art as a help in designing and building, is obvious. He is likely to regard it not as a means, but as the object in view, and in doing so he is likely to lose interest in the art of building, and in the structures which are to be the remote and intangible results of his pains, and to become fascinated and engrossed by the art which is present and is occupying his immediate interest and attention. He is tempted to make a draughtsman of himself, and never to qualify himself to become a builder at all.

Under these circumstances some, who are "born painters," as has often happened, give up architecture altogether. Others, less fully endowed with the painter's special gifts, but with an ample equipment of good sense and good taste, and of that appreciation of mass and solid form which is an architect's distinctive endowment, escape these temptations altogether. There have indeed been notable architects who are not known ever to have made any drawings at all. But others, and these the major part, have possessed and have cultivated the painter's gifts.

It is they who are most exposed to the dangers inherent in the special kind of draughtsmanship now most in vogue, that, namely, which has been cultivated with such splendid results in Paris, and which has become customary both in our schools and in public competitions. But drawings which are rendered in this way are far from presenting the real aspect of the buildings they depict. All elevations of buildings, indeed, avowedly exhibit them in an impossible aspect, showing them as they would appear if viewed from an infinite distance through a telescope of infinite magnifying power. The colors given to walls and roofs are also habitually false, being exaggerated for the sake of pictorial effect. The shadows are also often shown as blue or purple, and it has sometimes been the fashion even to make them yellow. They are also conventional in form, being cast so that they may indicate the third dimension, that is to say, the varying distances of the surfaces indicated, thus in a measure making up for the necessary deficiencies of a drawing made in two dimensions. This is effected partly by the shapes and sizes given to the shadows, partly by variations in their intensity, an exaggerated

aerial perspective being employed to suggest what linear perspective would show more completely and more intelligibly. Moreover, although orthographic elevations do give the real relative dimensions of the surfaces shown, and are thus exactly fitted to give information to mechanics, the relative sizes and the relative position in which they would actually appear, as seen from any attainable position, are greatly falsified. Thus the value of all this laboratory work, so far as it is intended to enable the designer to judge of the real quality of his design, is considerably reduced, and the habit of too confidently relying upon it for guidance is a danger which the designer is very liable to fall into.

The forms thus given to the shadows are, of course, transient forms, and however carefully outlined are such as would be seen only at a particular hour of the day. To regard them as an important element in the architectural composition is misleading and pernicious. It leads the designer to seek for picturesque efforts of *chiaroscuro* and brilliant arrangements of sunlight and shadow. These are proper to the painter, since, in his picture, they are as permanent as anything else. But the permanent elements in an architectural composition are the solids and the voids, and their relations to one another in space, and it is these things, not the lights and shadows, which the designer and builder should bear in mind. His building should be designed for all weathers, and these merits are best brought out, because most clearly seen, under a cloudy sky. What special beauties it may exhibit in bright sunlight are none of his concern. He may leave for painters and poets "Orvieto at Sunset," or "Melrose Abbey by Moonlight." Such effects are accidental and fortuitous. They are a kind of "by-product," not his proper concern.

It would be of interest if some school of architecture, bearing these things in mind, should try the experiment of establishing within its own borders a different style of draughtsmanship, adopting a scale of color more in accordance with reality, or, if a conventional spectrum, so to speak, were found necessary, using sober tints and substituting for shadows cast in sunshine such flat tints as might obtain under the diffused light of a cloudy day. A variety of such shades would still afford some indication of differences of distance. Hints for such a mode of treatment might be found in Japanese drawings, which are generally destitute of shadows, and in the work of M. Jules Guerin, which has of late become so popular in the treatment of architectural subjects.

All this, of course, is exactly opposed to what Mr. Ruskin has laid down. "I do not believe," he says, in a famous paragraph in the *Seven Lamps of Architecture,* "that any building was ever truly great, unless it had mighty masses, vigorous and deep, of shadow mingled with its surface. And among the first habits that a young architect should learn is that of thinking in shadow, not looking at a design in its miserable, liny skeleton; but conceiving it as it will be when the dawn lights it and the dusk leaves it; when its stones will be hot and its crannies cool; when the lizards will bask in the one and the birds build in the other. Let him design with the sense of cold and heat upon him; let him cut out the shadows, as men dig wells in watered plains, and lead along the lights, as a founder does his hot metal; let him keep the full command of both, and see that he knows how they fall, and where they fade. His paper-lines and proportions are of no value; all that he can do must be done by spaces of light and darkness; and his business is to see that the one is broad and bold enough not to be swallowed up by twilight, and the other deep enough not to be dried like a shallow pool by a noonday sun."

The idea of regarding a flat architectural drawing as a delectable thing in itself, rather than as a help toward a work of art in the solid, to be realized by and by, is carried to a deplorable extreme when, as is sometimes done, even the plan is made to exhibit a picturesque arrangement of thick walls and thin ones, large rooms and small, so as to present an agreeable pattern in black

and white, dispositions which, however decorative in the drawing, could not possibly be detected in the finished structure. Yet this is said to have been sometimes enjoined upon students, and to have served as a criterion of excellence in judging their work.

Such things as these happen almost inevitably wherever effective draughtsmanship is given the chief consideration. For these merits are conspicuous and unmistakable. They catch the eye at once. But in order to judge from the drawings of a building, whether plans or elevations, what its real appearance will be, how, on the outside, the masses will compose against the sky, or what impression, inside, will be made in passing from one story to another, from corridor to corridor, or from room to room, one must perceive something that no drawing can show, and which can be seen only by a serious effort of the representative imagination, the imagination which has been well defined as the "capacity for seeing in anything all the excellencies that the thing itself suggests."

"Rendered" drawings thus furnish an unsatisfactory test either of the merits or of the defects of the building that they represent, both because they fail to show how it will really look and because they often make promises which the completed building must fail to fulfil. This comes not only from the conventional forms and colors they employ, as has been said, but from their diminutive scale. Here they are as deceptive as photographs, which almost necessarily give an impression of greater delicacy of detail than really exists. In the church of St. Sophia at Constantinople, for example, the white marble capitals of the great columns look, in the photographs, like carvings in ivory. One is surprised to find them of huge dimensions and but rudely chiselled. Both perspective drawings and photographs, moreover, are apt to give a false impression of the relative size of features that lie at different distances from the spectator, for while elevations make the more remote features larger than they would in fact appear, photographs and perspectives are apt to make them look smaller. This effect is very noticeable, for example, in the photographs of St. Paul's, taken from Ludgate Hill, though the dome looks of imposing dimensions on the spot. So also with the Post Office in Chicago, a large building of a cruciform shape, surrounded by a lower structure which encloses the ground on which it stands. The way in which the central mass rises behind and towers above the lower buildings is one of the most effective architectural compositions to be seen in this country. This effect is unmistakable as one sees it from the opposite side of the street. But a photograph taken from the same spot exhibits no such merit. The larger masses, being three times as far away as the smaller ones, seem completely dwarfed. In this case elevations, or a perspective taken from a remote point, would probably do more justice to the design than a photograph taken from any spot where the building can really be seen. Thus the chief use of a perspective is to reveal mistakes not obvious in the elevation. The chief value of both perspectives and elevations is to inform and stimulate the imagination.

But while the perspective drawing of an exterior may thus make the more distant portions of a building look smaller than they are, or than they really seem, the higher parts in an interior view are likely to seem larger in the drawing than they would in fact. For it is a common phenomenon, though one not easy to account for, that things overhead seem much smaller than they do when at the same distance on a level. The most familiar example of this is afforded by the full moon, which always looks two or three times larger when on the horizon than when it is near the zenith. But the same thing is equally noticeable and equally remarkable with sublunary things. A plaster centerpiece, for instance, which, when lying on the floor, looks too big for any private house, will take on quite modest dimensions when set in place on the ceiling.

In the same way the interior of a

dome looks much smaller in diameter than the circular area which it covers, or even than the semi-circular arches which often support it. Hence the only way to make a large dome look large is either to bring the circle from which it springs relatively near the ground, as happens with the Pantheon, or to rest it on an octogonal plan, so that the supporting arches have obviously a smaller radius than the dome itself. This is done both at St. Peter's and at St. Paul's.

But if the dome rests on a high drum, as in these two buildings, even this device does not prevent its shrinking to half its size. In both these cases it is almost impossible to believe one's eyes, and to make the domes look as large as the floors they cover.

But in a drawing there is no such illusion. In the first place, unless the spectator's eye is brought so near as really to occupy the Station Point, or point in front of the drawing from which the sketch is supposed to be made, which is almost never practicable, the dome, instead of being nearly overhead, is nearly on a level with the eye, and looks quite as big as the floor below, only a few inches away. In the second place, since, as is usual, the picture is supposed to be vertical, and there is no convergence of the vertical lines, they being parallel to the picture, the horizontal distance between the walls is, and is seen to be, the same at the top as at the bottom. Thus, in a drawing, a dome looks as big as the floor it covers, though in the building it would look much smaller.

The same considerations make steeples and towers look much taller and more slender in perspective drawings than they would really appear when seen from the point from which the drawing is supposed to be made. In plane perspective there is, as has just been said, no foreshortening of lines parallel to the picture. Hence the structure has the same proportions in the perspective as in the elevation.

The upper parts of a spire, even when seen from a distance, and not from a point immediately beneath, look smaller than they are, being, like the moon, brought into contrast with the spaciousness of the firmament. It is surprising to find out how large the crockets on a well-designed Gothic spire really are, and the windows in the upper part of a Renaissance steeple sometimes prove to be as wide as those in the body of the house. Finials and crosses, designed on the drawing-table, though of good size, often prove too small for their position. They should therefore be designed on a larger scale, as, indeed, one is naturally disposed to draw them, since even on the drawing-board they are contrasted with great expanses of paper.

This being so, it is always well, if possible, when an impression of ample space is desired, to manage that the visible ceiling shall be larger than the visible floor. This is the case in St. Mark's, in the church of Sta. Chiara, at Naples, and in the Sheldonian Theatre in Oxford, and in this country in the proposed Cathedral of St. John the Divine in New York, in the New York Academy of Music, in the library of Columbia College, and in the Sanders Theatre at Cambridge. But this effect is, of course, not obtainable in theatres in which, as in the Opera House at Paris and in many others, the ceiling is of the same size as the pit.

Gothic churches, which generally show a width of three or five aisles on the floor and only a single lofty vault overhead, are at an obvious disadvantage in this respect. But it is sometimes overcome in a measure by making the aisles almost as high as the nave, as at Milan, LeMans, Toledo, and, above all, at Seville, or even making all the vaults of equal height, as at Frankfort and elsewhere in Germany, and at Bristol in England.

Here, then, again, the designer, in order rightly to judge the effect of his building, must rely not upon his drawings, but upon his imagination, and should sedulously discipline and train his imagination so that he may safely rely upon it.

The same caution is to be observed in the use of models. For while they show a hundred things which only a hundred perspectives would suffice to reveal, their diminutive size, even more than in the case of photographs, gives an effect of delicacy and refinement to details which, when executed in wood or stone, may prove to be coarse or brutal.

This is especially misleading when, as generally happens, the roughness of masonry is replaced by the brilliancy and delicacy of Plaster of Paris.

It naturally happens, also, that models are habitually looked at from above, and thus present the aspect which in drawings is given by a bird's-eye view. But this is an aspect which they do not really present except to birds. It shows the different parts of buildings in relations not contemplated by the designer, and which they do not present to the passer-by. Models are invaluable, since they bring out points which the designer might otherwise never discover until, too late, they became manifest in the finished building. But here, again, the designer must use the eye of the mind. Meanwhile, as a safeguard, he will do well to keep his model on a shelf, so that he cannot look down upon it.

In competitions, not only do these dangers beset the steps of the competitors, but in an equal degree are they likely to disturb the judgment of the judges. This is notorious when the decision rests with building committees, who, even if they know what is really wanted, are seldom qualified to select the best means of attaining it, and are generally defenceless against the wiles of the artful artist. But experience has shown that a jury of architects are equally liable to be thrown off their balance by enthusiasm for exquisite draughtsmanship. This is natural enough. For the merits of a drawing are obvious and tangible, and invite discussion. But they can influence the decision only by prejudicing the judgment. All this is, of course, still more likely to happen in the awarding of prizes and honors in schools, where academic excellences, among which good draughtsmanship properly has a conspicuous place, are a chief consideration. But here it is doubly pernicious, since it fosters and confirms the mistaken tendencies to which, as has been already pointed out, students in schools are unavoidably exposed. Separate competitions in draughtsmanship might well be established for them.

Here a jury, or bench of judges, is somewhat at a disadvantage, in comparison with a single judge, or assessor, as they say in England. For a single arbitrator, sitting alone, with an undivided responsibility, is in the first place able to take all the time he finds necessary to form a really judicial opinion, which is likely to take longer than could have been expected; while a jury, like any other committee, is apt to be hurried, being at the mercy of any member who has a pressing engagement. Moreover, he can, and will be likely to, bring to bear all his resources, going behind the surface and seeing with his inward eye things that cannot be conspicuously shown and can only be inferred. But a jury can confer together and compare opinions only upon what they all have in common, and that is the external aspect of things, just as the drawing presents them. What each sees with the eye of his mind is seen by him alone, and at first, at least, but vaguely, so that it is hardly in a form to bear the friction of open debate.

The obvious remedy for these evils is to banish exquisite draughtsmanship from this entire field, and to adopt in competitions of all sorts such a simple system of drawing as has already been suggested for use in schools. In public competitions, as experience has shown, an even simpler scheme abundantly suffices. For drawings made in line only, without any shadows at all, or any decorative accessories, and made on a small scale, suffice to set forth all the main features of the designs submitted for comparison, and it is by comparison of such features alone that a choice should be determined. This, moreover, effects a notable economy of time and money for all concerned.

Another thing which is meant for a help in architectural designing, but sometimes proves to be a hindrance, is the practical and theoretical rules that have been formulated, and which have

come to be held as safeguards in practice, if not, indeed, fundamental and absolute principles. One is here reminded of the witty saying that the two rocks upon which the French are most often wrecked are the two words *Logique* and *Principe*. This seems to imply that the French are apt to be satisfied with almost anything for which a good reason can be found or, at any rate, which is supported by a plausible theory. Anything that is "logical" is all right.

Viollet le Duc, in one of his discourses, explains this, saying: "We cry 'What a beautiful structure!' But this instinctive judgment is not enough for us artists; we ask ourselves, 'Why is this structure beautiful?' We wish to discover the causes of the effect which it produces upon us; and in order to do this we must have recourse to reason." But the modern French, or, at least, their followers, seem to go beyond this, and to make reasonableness their sole criterion of excellence. That things are "logical" seems to suffice.

But this is rather a dangerous rule, as one may daily convince himself by looking at the dreadful things which have been encouraged and justified by its authority. How dangerous it may be when carried to its logical extreme may be everywhere witnessed in the terrible structures by which civil engineers habitually disfigure both town and country. The monstrosities of architects are seldom so bad, but just so far as they rely upon this maxim as a rule of conduct are they venturing upon perilous ground.

Much the same thing is to be said of the practical rules by which it is hoped to lighten the designer's labors and responsibilities. For maxims of art, like all precepts, must be judged by their practical results. Conduct should be guided not by faith in an accepted rule, but by special study of the case in hand.

An instance of this is offered by the precept that the disposition of the masses on the outside of the building ought to correspond, point by point, with the arrangements of the interior, and this is indeed an excellent device for securing in a somewhat mechanical way a certain kind of architectural expression. It is a very good idea. But in art, as in manners, and, indeed, in morals, there are more things than one to be considered. It is as important to be civil as to be frank, and there are some truths that need not be uttered. Hotels had better not advertise their bathrooms by peppering the walls with small windows.

It is a very promising idea, for instance, in public libraries, to give to the reading-rooms and offices the large windows that betoken well-lighted rooms, and to indicate the bookstack by comparatively narrow windows, cutting slits in the wall opposite each little alley. But if this results, as it naturally does, in making this part of the building look like a prison, and in giving, within, a minimum of diffused light, just where a maximum of diffused light is most needed, this characterization costs more than it is worth.

One sometimes, indeed, hears architects criticised as paying too little heed to these well-approved principles. But the instance just cited shows that there is some danger in attaching too much importance to them, and two considerations of some weight may here be adduced.

In the first place, if the dogma that all good architecture should indicate in its chief masses the arrangements of the plan, and, in its details, the special treatment suggested by the material employed, nine-tenths at least of all the stone buildings that history has bequeathed to us—and the monuments of antiquity naturally consist of little else —must stand condemned. For except during a brief period of the Middle Ages all stone buildings, of whatever age or country, exhibit the adaptation to stone of forms characteristic of more ephemeral constructions in wood, reeds, stucco or mud. This is eminently the case with the entablatures and columns, in both Egypt and Greece, though their proportions are changed to suit the new material.

Nor does even mediæval practice afford any great warrant for this opinion,

an opinion which, in the height of the Gothic revival of sixty years ago, found expression in the dictum that we should "ornament the construction, never construct the ornament." The spires of the Middle Ages, as well as the colonnades of antiquity and the domes of the Renaissance, "shriek against this creed."

For architecture expresses something besides the art and craft of stone-cutters and masons. Domes and spires are works of sentiment, not works of utility. In them human aspiration is expressed not in terms of walls and arches, but in terms of pyramids and hemispheres, in the ideal forms of abstract geometrical figures, arranged symmetrically and in harmonious proportions. They are embodiments of pure line. If it is replied "so are fireworks," the answer confirms the contention. What is sublime in architecture is exactly that. Monumental buildings are just "pyrotechnics in stone."

The best-devised scheme of instruction, then, whether in the practical exercises of composition or in the principles that underly and inspire it, is calculated to divert the student from the real end and object of his studies and to fix his attention rather upon the means provided for its attainment. He is likely to think more of drawings and the excellencies proper to them than of the buildings, and the excellencies proper to buildings. He is likely, moreover, to rely too much upon theoretical maxims, too much distrusting what in all practical affairs must be his ultimate reliance, —namely, a careful study of the actual circumstances. Principles and authorities alike are to be weighed and considered, not blindly followed. Conduct is, in fact, in designing, as in other affairs, determined not by rules and examples, but by moral and intellectual character. The issue for good or ill depends upon one's judgment at the moment, that is to say, upon the amount of good sense and good taste one has at command.

When he has gathered from all sources all the hints and suggestions they offer, the architect needs to study the actual result which they will bring him, estimating its merits and defects as a whole, according to the standard of good sense and good taste that he has set up as a criterion in his own mind.

The creation of such a criterion, that is to say, of a judgment sane and sober, and free from the bias of theories or of fashions, is the best result that can be hoped for from study or experience, whether in schools or in offices. Such a judgment regards mainly the outline of a building and the composition of its masses and distrusts the promises that are held out either by speculative theories or by the *ignis fatuus* of pictorial draughtsmanship. For the poor appearance of a building cannot be excused by any such considerations. When a building is done it is always full of surprises, often most unwelcome surprises, to even the most judicious designers, and there is then little satisfaction in thinking that good reasons existed for all the mistakes.

Hence we may infer that architecture, like matrimony, should be undertaken not lightly and unadvisedly, but soberly, discreetly, and, not to speak profanely, in the fear of blunders.

ADDITIONAL NOTES.

I. One of the most sensible as well as most eminent of our architects, bearing in mind the deceitfulness of drawings, was in the habit of saying that he never felt sure that he had got a design into shape until the office boy's copy looked well. He regarded drawing merely as a means of conveying his ideas to his clients and to his mechanics, and did not consider artistic draughtmanship an essential or even a very useful part of an architect's equipment, any more than skill in versification is of value to an essayist, otherwise than as affording practice in the use of language. An architect may, indeed, well deny himself indulgence in so attractive and engrossing an accomplishment, on the ground that he cannot afford time for it, except, perhaps, in vacation, any more than he can find time to make of himself a first-rate mathematician, or civil or mechanical engineer, or electrician, or carpenter, or mason, or decorator, or to become an expert in heating or ventilation, or even in plumbing, whatever his natural gifts in these kinds. There is not time enough, either in a professional school or in active professional life, for one man to keep in touch with all these arts and sciences in their daily developments. An architect has enough to occupy all the time and all the wits at his command in attending to his own proper business, and properly performing the tasks that nobody else can do for him. There are plenty of people to do all these things who make a specialty of them, and who can do well what he cannot hope to do more than passably, after the manner of an amateur.

But amateur work is not what his clients want, and he ought not to put them off with it. The old notion that an architect owes it to himself to keep everything in his own hands, posing as a past-master of all arts and crafts, was never a tenable one even for men born with the gift of universal genius. Few men have ever entered into this birthright, and the notion that every architect should pretend to it has fostered an untenable and preposterous attitude which has brought deserved discredit upon the profession. All that the ordinary practitioner can honestly undertake is to understand these matters well enough to discuss them intelligently with his advisers, that is to say to be able to ask intelligent questions, to understand the answers, and to make intelligent suggestions, reserving to himself freedom to follow the advice given, or not, according as it does or does not promise to further the practical or artistic ends he has in view. His own part is to make choice among the alternatives offered him, according to his own final judgment, and to co-ordinate the whole into a harmonious and consistent scheme. Even this work of supervision, however well he may be prepared to undertake it, will hardly leave him time for his own proper work, that is to say for the thought and labor of putting into shape the ultimate scheme, the well-imagined end for which all these things are only means.

II. Very much the same caution is needed in dealing with proportions as with dimensions. Rooms of the same shape but of different sizes appear in the drawings to be equally well proportioned, for, whether large or small, the ratio of height to width is the same. But a room seven feet wide and seven feet high seems to be badly shaped, being too low for its width, while the House of Lords, which is forty-five feet wide and forty-five high, seems almost too high and narrow. Drawings would suggest no such difference. The lofty roof of Westminster Hall looks, in drawings and photographs, low and squat. The old Music Hall in Boston gave the impression of a tall and rather narrow room, being sixty-five feet high. Yet it was seventy-eight feet wide. But a room of the same shape, and that would appear to be so in the drawing, if only five feet high and six feet wide, would seem low. In all these cases drawings would be misleading. For every part of a drawing is nearly on a level with the eye, but one must lift his eyes, even in a low room, in order to see the cornice, and it is the effort to do so that gives the sense of loftiness. So also when one is lying on his back on the top of a hill the sky seems long and narrow, like his face, and the horizon appears not circular but oval. For looking down at one part of it over one's cheek bones and up at the opposite part over one's eyebrows, requires more exertion than seeing the other two quarters out of the corners of one's eyes.

Added height, also, tells in reality for less than one would naturally expect, on account of the perspective diminution, though in drawings it has its full value. For, owing to their small dimensions, the vertical lines in drawings are not foreshortened. A pier sixty feet high may indeed look twice as high as one of thirty feet, but an additional sixty feet does not make nearly so much difference, as may be experienced in French cathedrals, and even more strikingly out of doors. The five hundred foot obelisk at Washington, does not seem, when one is at its foot, very much taller than Bunker Hill Monument, which is less than half as high. So, also, in a street made up of eight-story and sixteen-story buildings, the sky-line looks hardly more ragged than with an alternation of four-story and eight-story houses, and "sky-scrapers" make less show from the sidewalks beneath than from a distance, where they loom up like towers, "*Quantum lenta solent inter viburna cupressi.*"