STEEL WORK

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Contrast with this the Gothic cathedral mediaeval times; still of stone but a type far different from that of the early temple; the change being due primarily to a knowledge of the principles of vaulting, the use of the flying buttress, the introduction of glass, and the vastly different conditions and requirements of the age. But the character of the cathedral as well as the temple was fixed by the structural framework, and is in its essentials but the results of the refinement of lines and masses imposed by conditions of equilibrium. This does not imply for a moment that the architect gives his first thought to the structural details of the problem. Quite the contrary is probably true, and rightly should be; but the properly trained mind will have a clear conception of the structural possibilities and their limitations, and this will be a dominating influence in the development of the design.

In modern times, and especially within the last half century, the conditions have become so complex, the possibilities so great, that the structural limitations on plan and form which governed and guided designers of the early ages con no longer be said to exist. The introdution of rolled steel shapes opened the way for wonderful changes in architectural methods. Buildings hardly dreamt of before became commonplace affairs. There seemed almost no limit to what could be done. Structures could be carried with ease and rapidity to heights taller than the tallest monuments hitherto erected. Architecture, at least in this country, went crazy, and it was not altogether the fault of the architect. He was simply the victim of circumstances, of the influence of the age in which he lived. The congestion in the great cities, the enormous value of the land in business centers, the demand for higher buildings to bring through greater floor areas larger returns on investment, and finally the coming of the new material, steel, by means of which this demand could be satisfied, were factors working to bring about the charge. The age was one of speed and hurry. There was little time to deliberate. The architect was forced to plunge in, and soon found himself beyond his depth.

The new conditions had been thrust upon him suddenly with no opportunity to prepare for them. The problems that arose in the construction of the new type of building could not be solved in a minute. On the structural side they were complex and beyond his knowledge. It required all his time to plan the general arrangement of the building. From the artistic standpoint alone it was a new and engrossing problem. He needed help, an associate architect specializing in engineering who could work in conjunction with him. The problem had become too big for one man to cope with; architecture had reached a point where her representatives must be specialists. But there were no architectural specialists in contruction; they had not been needed up to this time. So the architect did the best he could do under the circumstances: he turned the structural half of his problem over to another profession, that of the civil engineer, contenting himself with what was left, and giving little thought to the way in which the building he was designing would be supported. Anything could be built in steel; its adaptibility was practically unbounded; that part was the engineer's problem, and it was usually left to him. The architect did not understand the engineer, and the engineer neither understood nor appreciated the architect. The true function of the structural design was lost. The relation between the skeleton and the form no longer existed. The architectural sense became paralyzed by the suddenness and enormity of the changed conditions; some frightful architectural anomalies were perpetrated. Architecture became a sham: Buildings masquerading as heavy stone structures proved upon examination to be thin terra cotta envelopes supported on slender steel columns; the apparently heavy walls and piers turned out to be purely ornamental, and instead of helping to support the building were simply so much added weight to be carried by the steel columns of which their massive appearance gave no suggestion. All reasonableness of architecture had disappeared. Old forms belonging to far different types of structures were plastered without reason to a slender metal framework which of itself may have had no unity, and whose only purpose was to support the freak conception of the designer. Such structures could be made to stand, to yield comfort to those who lived in them, to return proper rentals to the owner, and to the casual observer to present nothing objectionable or unpleasant to the eye; but considered from the point of view of sound architecture they remain as insults to the profession.

The influence of such conditions was naturally felt much more strongly in this country than in Europe. We had few traditions of art. Our people as a whole cared little about architecture, and knew even less; they were satisfied with a purely utilitarian solution of the problem. Even our architects had for the time being lost their heads; yet the structures built under these influences, bad as they are, have a meaning and a function in the general progress. They represent the first steps in the working out of a new type.

Fortunately, we are gradually recovering our normal balance. The confusion of the new age is beginning to clear, and many earnest efforts have in recent years been made, with more or less success, to devise a form of building that should adapt itself logically to the framework of steel. The architect is learning more of engineering, the engineer is becoming more and more of an architect, and each is beginning to realize that to do anything really worthy of the name of architecture they must work in the closest relation. Many architects are specializing in structural work, and there is a steadily increasing demand for men educated as architects but with a thorough training in engineering principles and methods.

We are still a long way from solving the architectural problem involved in the use of the new material, and it will be many years before the solution is so well established as to mark another epoch in the history of architecture and to merit the name of a new architectural style. But the time has long since gone when one man can hope to specialize in both branches. Like the old family doctor with his one horse chaise and his bag of medicines ready to care for all human ills, the old-time architect has passed. It is an age of specialists in all professions, and today architecture naturally divides into two great branches, the first of which for want of a better name may be called the aesthetic branch, the second the structural. These two are so intimately related, so closely interwoven, that one is a necessary complement of the other, and no man should be called an architect who is not master of at least the basic principles of both.

With this point of view in mind the course in architecture at the Institute is divided into two options, one leading to specialization along the aesthetic lines, the other along the structural. The structural work in the Department is arranged to provide instruction suited to the needs of both options. In order that all students may have a knowledge of the fundamentals of the structural side of their profession, the preparatory study leading to the structural courses is practically the same for both options during the first two and one-half years. It includes mathematics, physics, and applied mechanics. At the middle of the third year the work of the two options diverges, becoming more and more practical in its application in each as it proceeds, but varying very much in the amount of time devoted to it in each option.

In the aesthetic option the time diminishes in relation to that given to the aesthetic courses, the required structural work ending with a course in elementary constructive design in the first term of the fourth year. Opportunity is offered however, to continue this course through the second term, the work being optional with that in fourth-year modelling. More advanced structural courses may also be taken by the graduates of the aesthetic option who return for a post graduate year.

In the structural option the time devoted to structural subjects relative to that devoted to other work, increases very rapidly from the point of divergence of the two options, until during the senior year by far the greater part of the student's time is taken up by the study of his specialty. Although the work in applied mechanics, strength of materials, and mechanical laboratory is taken in the Department of Applied Mechanics, and that in materials, foundations, and theory of structures in the Department of Civil Engineering, yet the course in structural design, which occupies practically every afternoon of the senior year, is given in the Architectural Department. All the problems are studied from the architectural view point. The work is done in the large drawing room where the student finds himself closely associated with the students of the aesthetic option and in an atmosphere emphatically architectural. Thus the instruction never ceases to be that of the architect, and the student of whichever option is imbued with a love and appreciation of the beautiful, which is, after all, the foundation of all things in architecture. The art element is the one essential without which the architect cannot exist, and the man who elects structural architecture for his profession should be one to whom the beautiful in art makes a strong appeal. It is an essential part of his profession; without it he may make a most excellent engineer, but an architect, never.

FIRST IN COUNTRY

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style, country, or methods of building operations. The instruction is general, not specialized. It seeks to implant in the mind of the student the great truths that underlie architectural composition, to teach him to apply these truths by training his taste, developing his individuality and imagination. The system neglects neither science nor technique. The study of the laws and methods of construction holds a most important place. In a word, it endeavors to produce artists made useful through sound preparation in all the difficulties of the profession, giving them adaptibility that will enable them to round out easily their stock in trade when later choice or circumstances will decide the direction in which their work shall lie.

The wisdom of adopting such methods as the Paris Beaux-Arts pursued, and to aim at attaining its high standards, has been proved through the entire life of the Department. In the general plan of instruction few changes have been made or demanded during all these years except for a simple modifying of the older courses, and aiding others as required and an alertness to strengthen it along the original lines due to the natural growth of the school.

We have added the Option in Architectural Engineering, the history of which is told elsewhere. We believe that no man can be a thoroughly trained practising architect without some knowledge of engineering. We further believe that the most artistic students should have no excessive difficulty in absorbing the mathematics necessary to understand those structural necessities which are the basis of any worthy architectural design. The pupil is taught that unless the constructive principles of his building influence his design he is a decorator and not an architect.

Our graduate class is an established fact, and the work it accomplishes after it has been relieved from the general studies is always remarkable. The practising architect always asks first for men who have had a year of this kind of work. The course in architecture should really be for five years, and the Bachelor's degree should represent the standard of the present Master's.

Our growth may be shown by our different removals. Our quarters became too small for us in the Walker Building and a new building was put up for the Department on Trinity Place, and was called the Architectural Building. This seemed very large at first but not only our members increased but we had been accumulating a valuable plant, library, drawings, etc., which the fire of 1898 had greatly jeopardized, and it was very desirable for us to occupy a fireproof building. Another move was made in the fall of 1898 into the Pierce Building, just then finished, and here we are at present. In 1906 further changes in our present rooms were made to bring our classes more closely together and more in touch with all the instructors, in order to still further make for the atelier spirit or enthusiasm which we are so proud of having, and without which the choicest curriculum on paper counts for little. We again want more room. We want to extend our field, and interest the community at large in what we are doing.

FREEHAND DRAWING

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The basis of all branches of freehand drawing is representation in black and white of the immediate appearance of objects. The principles, methods, and forms of practice which relate to such representation constitute the subject of pure drawing. The medium best suited for use in this study is charcoal. Broadly speaking, the methods of pure drawing concern observation and supplementary methods of verification, as perspective, anatomy, etc.

Fundamental processes of pure drawing are taught in connection with the courses in lettering and object drawing, taken by all first-year students. The early work in the Department of Architecture is but a wider application of these processes. The students work first from casts of ornament. These subjects are followed by casts of parts of the human figure, the whole figure, and portions of the Parthenon frieze: occasionally opportunity is given to draw from life. Throughout this work stress is laid upon generalization and accuracy in observation, and upon simplicity in the treatment of the drawing. The construction of ornament based on plant form is pointed out, and a certain amount of anatomy is taught incidentally. Frequent exercises in memory drawing are given.

As bearing on architectural methods, work with the pen, pencil and brush is introduced from time to time. To the same end, the size of the drawing is frequently changed. Ordinarily the drawings are made to fill 19x24 charcoal paper. But if confined to this, or any other size of drawing, the student is quite likely to do poorly if called upon to vary the size. Accordingly, in working from the human figure, any height of drawing between 1 inch and life size may be required.

The time in which a drawing is made is also an important question. In getting out a competitive drawing, in sketching, and from a business standpoint, the architect must generally draw not only effectively but rapidly. A certain amount of drawing subject to time limit should be therefore be included in the school training, and this need is met in the Department by exercises in time sketching. Thus, for example, when sketching from life the pose of the model may be changed five or six times in an hour, the student meanwhile making the same number of sketches, and of a size about 1 1-2 inches in height.

It is of course impossible to represent much detail in this short time, and this fact constitutes another valuable feature of the practice, namely, the seizing of essentials, and, consequently, the ignoring of that which is relatively unimportant.

A course in clay modelling is given in the Department which effectively aids in teaching the freehand drawing.

In the third year the work follows lines similar to those of the second year except that the amount of life drawing is increased, and, of course, the standard of rating is higher. In this and the fourth year the technique of architectural pen and pencil rendering is taught in a seperate course.

The fourth-year men work from the nude. The model is frequently posed to suggest the use of the figure in decoration, and in this connection a certain amount of latitude in idealizing the figer may be permitted. A specially designed stand is used for posing the figer in reclining positions. It consists of three concentric cylindrical surfaces of 90°, each of which can be used separately, fitted with sliding seat and foot rest.

The graduate course offers advanced drawing from life and figure composition. It the work from the figure the drawings are made life-size, and are studied more in detail than in the earlier work. The figures in the compositions are adaptations from the life models. The motif for a design having been announced each student works out his conception in sketch form. The life models are then posed as necessary for the execution of the design.

For several years past each graduate class has designed and executed a portion of the frieze in Huntington Hall, typifying the arts and sciences taught at the Institute. This work has been under the immediate direction of Mr. W. Felton Brown, and the result is a credit to both students and instructor.