

A SCHOOL FOR
CONTEMPORARY ARCHITECTURAL TRAINING

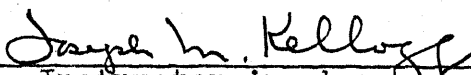
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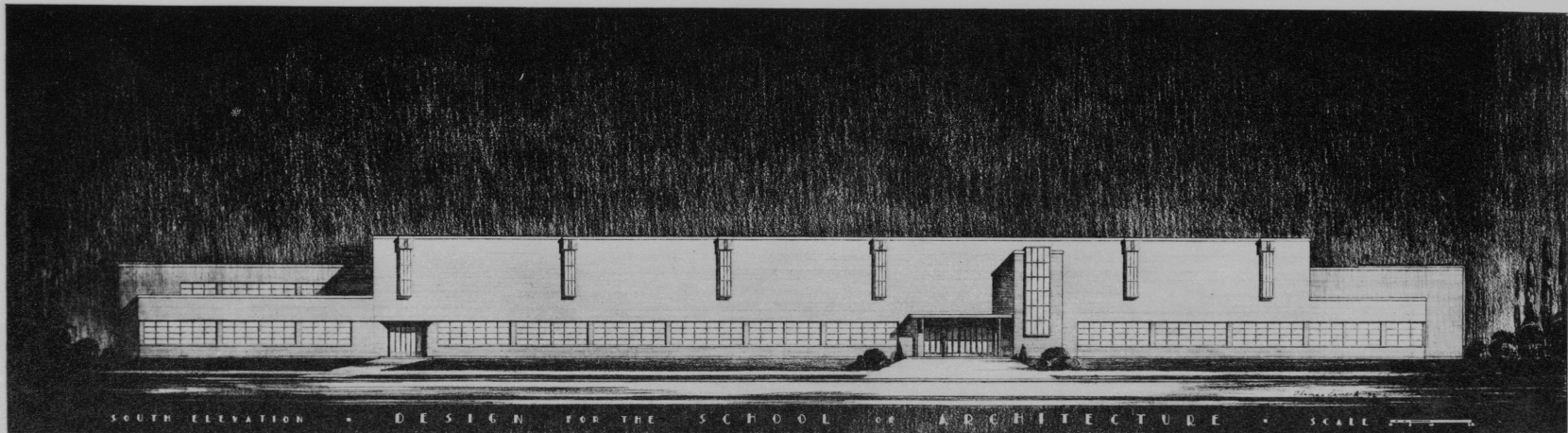
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Approved by:


Instructor in charge


Head of Department

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SOUTH ELEVATION • DESIGN FOR THE SCHOOL OF ARCHITECTURE • SCALE 1/4" = 1'-0"

South Elevation of the Design
for the
School of Architecture

!!!

Dedicated to:

Professor Joseph M. Kellogg
and
The Faculty of the
Department of Architecture

For
their sincere criticism and
encouragement in the prepa-
ration of this thesis.

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A SCHOOL FOR
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INTRODUCTION

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The architectural profession has progressed so rapidly and has become so much more complicated in the last fifty years that architectural education as a means of providing adequate replacements for the profession has been left behind. The liaison between these two phases of the profession seems in many cases to have been broken.

The apprentice system which, until the rise of our schools of architecture in the latter part of the last century, provided the profession with most of its future architects, has been almost entirely abandoned, mainly because of the economical situation, though somewhat because of its own shortcomings.

The schools of architecture, to meet the ever increasing demand for graduates, have tended toward a mass production of quantity, with less thought to quality. The shortcomings of the majority of the schools of architecture are quite obvious, and especially so, to the young architectural graduate.

Although the young graduate may think the demand upon him is great, the demand upon the architectural profession to serve its function satisfactorily is greater. Some of our leading schools of architecture realizing this need, and knowing that they have many antiquated ideas, are limiting the number of students, and are gradually changing their courses to meet the contemporary demands of the profession. The present economical depression has done much in bringing about a realization of these demands. As our architectural education is entering a period of rapid transition, the stress placed upon architectural education may cause it to swing too far in the direction of what is commonly known as the economical and practical. Perhaps no words of forewarning are more suitable than the words of Frank Lloyd Wright in one of his recent lectures: "Merely to enable you, young man, to make a living by making plans for buildings is not good enough work for any school." *

* Lecture: "To the Young Man in Architecture" by Frank Lloyd Wright at the Chicago Art Institute.

No logical discussion of architectural education can be carried on without first determining the purpose involved. What is this purpose? To prepare young men and women for life in general and to become architects, and also to further the public's appreciation of architecture. How are we to do this, and how far can this process be carried on in school? Furthermore, what is the status of the architect? With these questions in mind it has been thought well to consider both the education of the architect and his status in the past, and his present education, and to discuss a school for contemporary architectural training, and to design a building to meet its requirements.

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THE EDUCATION AND PROFESSIONAL STATUS OF THE
ARCHITECT IN HISTORICAL TIMES

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It is interesting to know that the architecture of the past had its architects. The architect of former times, though he may not always have had the title of architect, held relatively the same position as the architect of today. He drew the plans, which may often have been only sketches, and he directed the work in the process of construction.

In Egypt we find the earliest record of the architect in the hieroglyphic inscriptions on the walls of the temples and tombs. These inscriptions tell a rather accurate story of the life of the time, and the architects. The Egyptian architect held a high social position in the court and the temple. His education consisted chiefly of the study of the mathematics known in his day, and he was usually taught by the priests of the temples. He drew his plans on papyrus.

Our word "architect" is derived from the union

of two antique Greek words meaning chief, and craftsman. It is also to be noted that these words differed from the word for the manual worker. It may be concluded from this that the Greek architect was an educated man and that he did not come up from the ranks of the manual laborer. His professional status was generally recognized and the scope of his service included architecture, sculpture, engineering, and town planning. The Greek architect's education evidently was attained in an atelier or by an apprentice system. It is doubtful if there were any architectural schools, but there were monographs written by architects explaining their own buildings and describing new features of construction or design. These monographs were studied and discussed.

The Roman architect and what his education should have been are well summed up in the writings of Vitruvius, a Roman architect, of the age of Augustus. He wrote ten books intended to cover the whole field of the contemporary architecture of his day. He begins his books with a preface on the education of an architect.

Vitruvius has been quoted so often in articles on architectural education that I hope that I may be pardoned for quoting him again.

"Architects who have aimed at acquiring manual skill without scholarship have never been able to reach a position of authority to correspond to their pains, while those who relied only upon theories and scholarship were hunting the shadow, not the substance. But those who have a thorough knowledge of both, like men armed at all points, have the sooner attained their object and carried authority with them."

He was thoroughly convinced that technical training should be broad and that it should be both theoretical and practical.

"Neither natural ability without instruction nor instruction without natural ability can make the perfect artist. Let him be educated, skillful with the pencil, instructed in geometry, know much history, have followed the philosophers with attention, understand music, have some knowledge of

medicine, know the opinions of the jurists, and be acquainted with astronomy."

Vitruvius realized that his requirements of an architect's education would seem too general so he wrote:

"Perhaps to the inexperienced it will seem a marvel that human nature can comprehend such a great number of studies and keep them in the memory. Still, the observation that all studies have a common bond of union and intercourse with one another, will lead to the belief that this can easily be realized."

He goes further to explain what he means by the various things of which he would have the architect have a knowledge. History is defined as historical symbolism. Philosophy included the knowledge of physics, and was to make the architect refined, courteous, and honest. A knowledge of medicine means what we now include as a part of building sanitation. The opinions of the jurists was really architectural law. Music and astronomy as he explains then were required in those days for a purpose, but the architect

of today has no longer a need for them in the particular aspects that they were used. Music was used to determine by tunes the tightness of the twisted sinews used in holding frames together and in the military machines. A knowledge of astronomy was necessary to put the work of the architect in harmony with the stars.

Vitruvius does not tell how the young architect obtained the training necessary to gain the knowledge that he has mapped out for him, but from Vitruvius' opinion of the necessity of stressing both the theoretical and practical it would be safe to assume that the practical knowledge was learned by some means of apprenticeship or atelier system and that the theoretical knowledge was learned in the schools, such as they may have been. There are records at later dates of the establishing of professorships in architecture.

Vitruvius also tells us that in his time the profession was overcrowded with the uneducated and the unskillful, men who rushed into architecture without even a knowledge of the carpenter's trade.

The scope of the duties of the Roman architect were those of town planner, military and civil engineer, and architect.

Apparently very little seems to be known about the architects of the Middle Ages by those outside of a comparatively small group of historians. The average architect and even some professors of architecture are still believing that there were no real architects of this period. They think that the Gothic and Romanesque architecture grew out of the guild system without the guiding hand of anyone other than that of the Church.

The architect of the Middle Ages was usually known as the Master-Mason, and only at very few times was he one of the clergy. Socially he ranked in his day with the architect of today, and his services varied from military engineering to sculpture and painting.

The young architect of the Middle Ages acquired his training by serving as an apprentice to the Master-Mason architect for several years, sometimes

as much as ten years. There is very little likelihood of his having come up from the ranks of the manual worker without having gone through this apprenticeship. These young architects became talented draftsmen and were well versed in geometry and mechanics. As the architecture of the Middle Ages was primarily one of stone, they had to master masonry. The thrusts of the vaults, the counterpoise of the buttresses, the design of the tracery, etc., were masonry problems. The other crafts were secondary.

Vasari's "Lives" gives a very interesting picture of the architect in the first part of the Italian Renaissance. He shows that the apprenticeship system continued to be the chief means of training the young architects. This was supplemented by several years of research in Rome in measuring and sketching antique buildings. In this work Roman engineering as well as the antique forms and details were studied. The additional education that these young architects received depended somewhat upon the social and financial standing of their parents. The earlier architects were of both noble and poor parent-

age, but later they were almost entirely of the former. This education of the more fortunate ones consisted mainly of the study of mathematics, mechanics, geometry, perspective, and literary subjects.

It is interesting to note that there was no sharp division between "science" and "art". The services of the architect were still those of town planner, military engineer, and civil engineer, as well as those of architect and artist.

M. S. Briggs in his book "The Architect in History" says: "It is hard to realize that the same man might be designing fortifications one day and painting Madonnas or carving crucifixes on the morrow."

A change came over the young architect's training with the establishing of the architectural academies. The first of these was the Accademia di S. Luca in Roma. The architectural student still remained an apprentice, but he had to supplement this by attending the lectures at the Academy at Roms. The academies did much to hinder real knowledge of architecture at that time in that they set

up a sort of book-learned architecture. Sir Thomas Jackson in his book "Architecture" says: "Vitruvius became the architects' Bible. The effect has been to bring the Art into bondage of formula, to enslave practice to theory, to extinguish originality, and to make architecture into a mechanical pursuit--in fact, instead of the architecture of freedom and imagination to give us the architecture of the book."

In France previous to the founding of the French Academy of Architecture by Colbert in Paris in 1671, French Renaissance architects received their training through the apprentice system, and a few studied in Rome in much the same way as the Italian architect of that period. This exodus of French students to Rome was evidently sufficient in numbers to warrant the founding of the French Academy at Rome in 1666. The "Prix de Rome" was founded in 1720, and since then the training of French students of architecture has had one ultimate aim--the Prix de Rome. The number of students of the Academy in Paris was at first limited to twenty-eight. The entrance competition was introduced in 1717, and in order to secure fair play

among the competitors the loge system was started in 1744.

In England an attempt to found a Royal Academy for teaching languages, mathematics, painting, architecture, etc., was made during the reign of Charles I, but the scheme failed when Charles I was executed. A number of Academy Schools sprang up in England in the early part of the nineteenth century and a method of training known as the pupilage system was introduced. It was suggested that there be preliminary courses in science, mathematics, construction and materials, drawing, etc., taken at University College, King's College, or some similar institution, but the suggestion was evidently not carried out. The pupilage system was usually supplemented by study and travel in Italy.

One noticeable thing in the professional status of the architect during the early nineteenth century was the establishing of the separate profession of civil engineering. This was evidently due somewhat to the education that the architect received, for Joseph Gwilt in criticizing this period said:

"Mathematics have, perhaps, been too much neglected by some of the architects of this country. The consequence has been the establishment of a new branch of art whose professors are called civil Engineers." In mathematics he evidently includes its application to mechanics and structural science.

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THE ECOLE DES BEAUX ARTS
and
THE AMERICAN SCHOOLS OF ARCHITECTURE
from 1865 to 1920

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The Ecole des Beaux Arts had more influence on the American Schools of Architecture during the period from 1865 to 1920 than any other factor. From the time Richard M. Hunt entered the Ecole in 1845 to the World War there was an ever increasing number of American students at the Ecole. These students on their return to America, with the assistance of French teachers in this country, have done much in developing the American schools. W. R. Ware, a pupil of Hunt's organized the first American school of architecture at Massachusetts Institute of Technology in 1865 modeled after the Ecole.

For years there has been a question as to whether this influence of the Ecole has been wholesome. It will be better here to present a few facts about the Ecole rather than to attempt to answer the question

point blank.

The Ecole grew out of the old French Academy in Paris. It retained from the Academy the atelier system with practicing architects for patrons. It is a free school supported by the French government. The entrance requirements in the latter part of the nineteenth century consisted of an examination that covered architectural composition, modeling in clay, drawing from cast, descriptive geometry, plane and solid geometry, algebra, arithmetic, and history. If the applicant failed to pass the first three, he was not allowed to take the others and a failure in any of the others would eliminate the applicant.

The examinations were held twice a year, and only about one-eighth of the large number applying were admitted to the school. Sometime during the early nineties this number was limited to thirty.

The examination for architectural composition was an analytique esquisse-esquisse. After the first three, composition, modeling and drawing, the examinations of the other subjects were written or oral and only one question which was very general was asked.

Once admitted the student was free to choose his atelier and work whenever he pleased. The only regulations of the Ecole were that he visit the school twice a year and that he could not stay after he was thirty. The ateliers had their own special rules.

In addition to the ateliers there were given in the school, courses in mathematics, construction, history of architecture, theory of architecture, literature, etc. The student was free to attend these courses as he pleased.

The Ecole was divided into two classes. The student was admitted to the "second" class on passing the entrance examinations. To be admitted to the "first" class the student of the second class had to receive a certain number of values on his design work and to pass an examination and receive honorable mention in history of architecture, mathematics, descriptive geometry, stereotomy, perspective, archaeology, construction, drawing of ornament, drawing of the human figure, and modeling of ornament in bas-relief.

Ernst Flagg in Volume 3 of the Architectural Record gave the following reasons for the supremacy of the Ecole in architectural training:

1. "Most of the poor material is weeded out by the entrance examinations.
2. "Advancement is determined by results and not time.
3. "All the instruction is based on a system of competition, not only between students but between ateliers and patrons.
4. "Architecture is taught by the greatest masters of the day, practicing architects, men of the highest distinction and ability.
5. "The student himself is not in such a hurry to make money that he cannot afford the necessary time for an education.
6. "Encouragement to effort by numerous endowed prizes."

The principles that the Ecole attempted to follow were those set down by Gaudet in his book "The Elements and Theory of Architecture". The summary of these principles, as Gaudet taught them are:

1. "You must be faithful to your program, be familiar with it; and also see correctly what is the character to be kept in the building.

2. "The ground, location or climate can modify absolutely the expression of a program.

3. "All architectural composition must be constructible. Every inconstructible scheme is absurd. Every scheme of construction more difficult or complicated than necessary is mediocre or bad.

4. "Truth is the first requirement of architecture. Every architectural untruth is inexcusable. If in some cases one of these untruths is overlooked on account of the ingenuity and ability shown in the building, the impression given, nevertheless, is of an inferior art.

5. "Effective strength is not sufficient--it must be apparent.

6. "Designs proceed by necessary sacrifices. A design must be good first of all, but it must also be beautiful. You must compose then with a view both to the utility and beauty of the building. And, as an element of beauty, you will try to obtain

character by variety."

The Ecole maintained that the ordinary practical affairs of every day practice could be quickly picked up, but that the principles which were taught at school could be learned in no other way and in no other place, and that it was the principles that counted.

The general aim in training in architectural design at the Ecole was to teach the student a method of attacking and studying any problem with which he might be confronted.

The following paragraphs dealing with the Ecole are some observations of their teaching of architectural design.

The student's success or failure depended upon his ability to seize the parti. The parti was studied and restudied and constantly revised. Daily criticisms were given by the fellow students of the atelier and occasionally by the patron, and primarily the artistic considerations were emphasized.

In the Ecole there was no time to read up on the subject of the problem so as to be able to consider it intelligently before actual composition commenced.

The criticisms given by the patrons at a glance could deal only with accepted relations of this or that form. The student soon learned this, and therefore, chose the theoretical proportion that he knew to be good in the eye of the patron and the judges.

The student learned to plan with his eyes rather than with his mind, and consequently often forced the conditions which governed the problem to fit the accepted forms.

This theory of planning could not be applied satisfactorily to every type of building. Furthermore, there was no attempt to seek the practical requirements in planning.

The Ecole taught that the plan was an assemblage of symbolic indications, and that when it was rendered according to their rules of shades, tones, values, etc., it would be understood perfectly by their judges.

Although the system of training at the Ecole may have been suitable for the French, and although it had some wholesome influence on the American schools, the system as a whole was not practical for America. The principles of the Ecole were fine, but

in the teaching of design it is apparent that they did not study the mechanical and the utilitarian aspects of architecture. Instead of following the principles of Gaudet the student soon came to think of the building as an artistic picture on paper, an abstract picture of plan, composition, and detail.

As before stated, the first course in architecture in the American schools was established at Massachusetts Institute of Technology in 1865. It was followed by the University of Illinois in 1868; Cornell University in 1871; Syracuse University in 1873; and Columbia University in 1881. From 1890 to 1900 eight more courses were established; from 1900 to 1910 there were nine; from 1910 to 1920 there were nineteen; and twelve since 1920.

These early courses in architecture were in many cases established as an adjunct to courses already existing in engineering. At Columbia, for example, the course in architecture was founded as a branch of the School of Mines. Although many of these early courses were gradually separated from the engineering schools, a majority of the architectural schools of

today are still affiliated in some manner with the engineering schools.

The following announcement of courses of the School of Architecture at Cornell University is an example of the early courses in architecture: (1872-73).

First Year.--Algebra; French or German; physiology; rhetoric; drawing; geometry; zoology; trigonometry; ancient history.

Second Year.--Analytical geometry; French or German; physics; chemistry; drawing; differential calculus; botany; lectures on construction and building materials.

Third Year.--Integral calculus; descriptive geometry; lectures on Egyptian and Greek architecture; drawing; mechanics; lectures on Roman architecture; geology; shades, shadows and perspective; lectures on Byzantine and Romanesque architecture.

Fourth Year.--Stereotomy; geology and physical geography; lectures on Gothic architecture; drawing; photography; mechanics applied to construction; lectures on Renaissance and Modern architecture;

lectures on composition and the art of designing; lectures on sculpture; painting, glass, mosaic, tiling, decoration, ventilation, warming, acoustics, contracts, specifications, measuring, professional practice, etc.; exercises in designing.

The first two years of this course were the same as that in the "General Course in Science" except for the lectures on construction and building materials, and the last two are very similar to those two years in the Civil Engineering course at Cornell in 1871. It contrasts very much with the course at the Ecole. As far as architectural design is concerned it might have been considered as a preliminary course to the Ecole.

The French influence that was wholesome, that influence from the American architect who had received training at the Ecole and from the French architects who came to this country, was the lengthening of the course in design and teaching it by the problem method instead of teaching it mainly by lectures.

This was done only at the expense of the non-technical subjects as the course remained a four-year

course, and to allow more time for design meant dropping some of the other courses.

The American schools inherited from this French influence, to a certain extent, both the good points and the bad points of the Ecole, and yet they remained distinctly a product of the American college system.

By 1900 the courses in architecture in the earlier schools were fairly well established. The schools had freed themselves from their parent engineering schools to the extent of being separate departments with their own courses or even separate schools.

The important changes in the courses had been to eliminate much of the nontechnical subjects, and to lengthen design and to teach it by the problem method. The Freshmen usually began their preparatory work in design, by study of architectural drawing or elements of architecture. The second year composition was studied, and the third and fourth years design problems in plan, elevation and section were taken. The fourth year was almost entirely devoted to design.

Freehand drawing, which did not appear in the early Cornell course, was usually taught throughout the four years. Pen, pencil, or water color, was used in practically all design work.

History of architecture took a more important place and was introduced into the course earlier; sometimes in the first year and sometimes in the second year. The study of historic ornament became popular. It was taken concurrently with history of architecture or followed it.

Nontechnical subjects such as rhetoric, literature and foreign languages were taken during the first two years and usually in common with the students of the colleges of liberal arts and sciences.

Mathematics courses were cut to some extent and relegated to the first two years. These were followed by courses in mechanics and engineering on a limited scale.

Elective courses in Architectural Engineering had been introduced at some of the schools. At first these courses took the place of fourth year design.

To get a better point of view of the schools

of this period it might be well to put down a few facts about some of the schools.

In 1900 At Columbia, the student was encouraged, and expected to rely upon his own judgment, taste, and individuality in the performance of every task that was presented. No mentions were awarded on the design problems. The interest of the subject and its importance to the student was relied upon to make him work. The school maintained that the trouble with mentions were that unless they were distributed pretty freely, so that they lost their meaning, they would help only the men whose training or special facility gave them the best start, and they would demoralize and discourage the less fortunate who were equally deserving and sometimes equally capable men.

How different that attitude of Columbia is compared with its attitude today. And, it did not last long, for six years later they were giving awards. The old division of design into classes had been abolished. The design course was divided into three parts, each of an indeterminate duration. The student progressed from one division to the other according to

his ability to make points which were given according to the awards he received.

The earlier Freshman course of elements of architecture consisting of learning the orders, casting shadows, laying washes, etc., and the use of the orders and classic forms, was insisted upon as entrance requirements.

These requirements and the requirement for two years of collegiate or scientific school study were adopted in 1905. Special students of architectural experience were admitted without these requirements.

The Freshmen began design by taking "Elementary Design" the first part of the three divisions. It consisted of doing simple buildings with or without the use of the orders. They were studied in plan, elevations, and section, and presentation was emphasized.

When the student had the number of points necessary he passed on to "Intermediate Design". And with the necessary points in this he passed on to "Advanced Design". When the necessary points in this were received and the prescribed lecture courses completed, the student was ready for graduation. The type of work in these two divisions was practically identical to

the present day Beaux Arts Institute of Design class B and class A problems.

Columbia maintained at that time (1906) three design drafting rooms, of which two were ateliers in down town New York. In fact it was very similar, as far as the design course went, to the Ecole in Paris.

Freehand, at Columbia, was made an auxiliary of every subject taught that involved the use of the pencil, pen, or brush. The exercises in free-hand were related to the rendering in elements and design of that particular year or they were paving the way for the rendering of the next year. They were related to architectural history in that some of the exercises consisted of tracing, copying, etc., plates of historic buildings.

The study of architectural history was carried on by lectures by the instructors and by research, drawing, and designing on the part of the students. Ancient, mediaeval, and modern history were studied during the first three years. The research consisted of written reports, illustrated by drawings of special

subjects such as domes, tracery, etc. In the fourth year this research was continued under the name of advanced architectural history.

There was also a course known as historical design which was evidently very similar to the present Beaux Arts Institute of Design archeology problems. The historical styles were studied not as mere curiosities, but as languages to be used.

At intermittent times the students made measured drawings of the buildings in New York City.

Chemistry, physics, etc., such science courses that appeared in the early Cornell schedule were by this time considered at Columbia as not essential to the making of an architect. And rigid courses in mathematics, engineering, and mechanics were considered less suitable to the architect than to the engineer. Courses in building materials were substituted in place of some of these.

Another of the early schools of architecture on which it has been possible to find some historic material is Massachusetts Institute of Technology. It is interesting to compare it with Columbia for

in some ways they are similar, but in many they contrast.

Massachusetts Institute of Technology maintained that: "The curriculum has been planned to prepare the foundation upon which the student is to erect his superstructure of architectural capacity. . . .

"The student's mind must be educated to reason and think clearly and logically. His sense of beauty must be trained and cultivated. His imagination stimulated. He must see that architecture is essentially a fine art and that its practice must be based on a broad general cultivation and liberal training in design founded on the principles underlying sound construction." *

Entrance to M.I.T. was by examination except for college graduates and special students over twenty-one years of age who had had not less than

* "American Schools of Architecture--Massachusetts Institute of Technology" by F. W. Chandler, Architectural Record, Vol. 21 (1907).

two years of office experience.

History of architecture and architectural design were begun in the second year with the study of classic architecture. In connection with design there was a course in shades and shadows, and lectures on the theory of architectural design. The design problems were of both the sketch problem and the major problem types. It is interesting to note that sketch problems were sometimes a week long, and that the major problems had a two-day preliminary sketch.

The aim in history seemed much different from that at Columbia, where it seemed to be for the purpose of learning an architectural language. At M.I.T. the aim was to show that the styles portrayed certain periods of the progress of architecture and civilization. That the styles were a natural and logical response in building to the social and political conditions, and to the materials of construction and the knowledge of their use; that as these conditions changed the styles changed; and that construction was the basis of all good architecture.

As at Columbia sketches and research in history were also required.

The history course was followed by a short course in history of European civilization and art.

Lectures and problems in design and rendering were given in the study of ornament.

The engineering courses were not slighted as at Columbia. They were followed by a course in constructive design which was the application of the knowledge obtained in the engineering courses.

Besides these there were courses in working drawings and specifications, in building materials, and in heating and ventilating. Not only was there an option in architectural engineering, but also one in landscape architecture.

These two schools are typical of a majority of the schools during the period from 1865 to 1920.

However, there have been exceptions to these typical schools, two of which are outstanding. They are the University of Michigan, established in 1906, and the University of Oregon, established in 1914.

At the University of Michigan architectural design has been taught for years on an entirely different

basis from that of the typical school. Their aim has been to give a well rounded architectural training. The student started his design work in a study of pure abstract design instead of in the study of the Orders. From abstract design the student advanced to the study of small buildings, and from these to larger buildings and group problems.

At the University of Oregon after a few years of trial in methods of teaching design similar to the typical schools, the so-called noncompetitive system was started. It was believed at Oregon that competition was a source of irritation, and as a method of training it tended to create inferiority complexes in the less able students and exaggerated ego in the winner of first place. By eliminating competition in design, it was no longer necessary to classify the students into hard and fast groups. Each student was treated as the individual case which he really was.

Neither of these two schools followed the programs for the study of design as laid down by the Society of Beaux Arts Architects. They chose to prepare their own programs for their problems.

In 1916, the Beaux Arts Institute of Design was organized, and it took over the educational function of the Society of Beaux Arts Architects which had been formed originally in New York City in 1894 under the name of the Beaux Arts Society of Architects. It was composed of architects who had received training in the Ecole des Beaux Arts in Paris.

One of the main objects of this society was: "to cultivate and perpetuate the associations and principles of the Ecole des Beaux Arts of Paris." In order to more fully carry out this aim the Society opened ateliers in the large eastern cities. The first of these ateliers was opened in New York City. The ateliers were started mainly so that architectural draftsmen working in the offices could improve their abilities by taking design problems under the criticism of practicing architects. The programs were written and issued by the Society, and the problems were judged by juries selected by the Society. In all this design, the work was very similar to that of the Ecole in Paris.

In addition to the draftsmen, students in the

schools soon began to use this service. In 1904 the Paris Prize was founded by the Society. It might be said that the Paris Prize became the one ultimate aim in this training as the Prix de Rome had become the ultimate aim of the French students of architecture. Since the establishing of the Paris Prize an additional number of minor prizes have been added that increase the students' interest in the service offered.

Although the Society of Beaux Arts Architects and the Beaux Arts Institute of Design have had very great influence on our architectural training, and especially that in design, it must be remembered that "The Beaux Arts" does not educate. It issues programs and provides for the exhibiting and judging of the problems. The patrons of the ateliers and the professors of the schools must do the rest.

It seems strange that the schools should continue to use this service. Let us note some of the reasons usually given as to why the schools adhere to the Beaux Arts:

1. The dominating influence of the leading men

in the profession, most of whom are Beaux Arts men.

2. The fact that in the past the Beaux Arts has done much to bring design from its lowly position to its present standard.

3. The element of competition between students and schools.

4. The tendency to coordinate the work in design in all of the schools.

Another reason that might be given is, that during this period from 1865 to 1920 most of the professors of architecture had been trained in the Beaux Arts manner, had attended the Ecole, or were so thoroughly in the habit of using the Beaux Arts system that they were prejudiced in favor of it.

Some of the reasons against adhering to the Beaux Arts are:

1. The Beaux Arts schedule of problems usually does not coincide with the academic schedule of the various architectural schools.

2. The many evils of a highly stressed competitive system.

3. The programs do not always fit into the

social and economic picture of the whole of the country as we know it, and they do not seem to be arranged on a prepared progressive system of education.

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THE CURRICULA
of the
AMERICAN SCHOOLS OF ARCHITECTURE
OF TODAY

!!!

In an article written about four years ago John V. Van Pelt, former Dean of the College of Architecture at Cornell, informs us that due to the narrowness of the American college system in architectural training the American Institute of Architects, about 1917, advocated that the school training period for architectural students be extended from four years to five years. The four-year course with its overload of eighteen or more university hours per semester was restricted to a large extent to technical subjects, and there was insufficient time for nontechnical subjects.

In 1912 the Association of Collegiate Schools of Architecture was founded. It was organized to foster higher standards in architectural training, and its members are considered the leading schools of the country. They took up in 1920 this problem of increasing the regular four-year architectural course

to five years as advocated by the American Institute of Architects.

The five-year course that the American Institute of Architects advocated or rather the principle of it was not new. Columbia University has required two years of college work for admission to architectural courses for a degree since 1905. The course in architecture at Rice Institute has been a five-year course since the founding of the course in 1912. In 1911 Cornell had offered a five-year course as an option paralleling the regular four-year course. This five-year program was such a success that it led to the adoption of a regular five-year course and the discontinuation of the four-year course in 1922. The University of Oregon also adopted the five-year course for architecture in 1922. The lead of these two schools was followed by Carnegie Institute of Technology in 1923, and by the University of Southern California in 1925.

By 1926, five other schools were offering a five-year optional course paralleling their regular four-year courses. Harvard University required a

baccalaureate degree for admission to architecture. California and Princeton had combined the general academic courses with the professional courses; and the former conferred an A.B. degree at the end of the fourth year, an M.A. in Architecture the fifth year, and Graduate in Architecture the sixth year; the latter conferred an A.B. at the end of the fourth year, and M.F.A. in Architecture the sixth year.

A large majority of the schools were in favor of the five-year course but deferred adopting the course. To a large extent the deferment was due to the following two reasons: affiliation with engineering or other courses in which the longer program was not favorable at that time; and competition with near-by schools which made such a move impracticable without a combined action of all such schools.

There was also some fear in the earlier part of the last decade that an additional year would lead to an increase in the technical subjects instead of an increase in the nontechnical subjects. The Association strongly expressed the opinion that the additional year should provide for an increase in

cultural subjects. From a table of averages prepared by Prof. Goldsmith of Texas University for schools of the Association in 1929, we find that the average of nontechnical subjects of six five-year schools was only three-tenths of an hour more than the average of such subjects of fourteen four-year schools. The adoption of the five-year course has increased, and at the beginning of the fall term in 1931 there were eighteen schools offering the five-year course in architecture.

Since 1913 an effort had been made by the Association to arrange the subjects of the various courses into groups and to evaluate the course according to the time allowed to the groups. This developed into what was known as the "Standard Minima" which the Association adopted as a minimum requirement for admission to membership in 1924. Although this "yard-stick" method of judging architectural training was abandoned in 1931, the schools that were not members of the Association had been aided by using it as a bit of propaganda to boost their courses, etc. up to the standard set.

It will be interesting to note what this

"Standard Minima" was, and what was considered the minimum requirement to be a recognized school.

The "Standard Minima" was based on the normal four-year course of 120 hours, with each credit hour having the equivalent of forty-five hours of actual work. The institution was to be of "collegiate rank" as defined by the Carnegie Foundation for the Advancement of Teaching, and the requirements for admission to the course in architecture were to be not less than fourteen standard high school units. The minimum requirements for the courses were the following:

<u>For Architecture</u>	<u>Credit Hrs.</u>
<u>General or Academic Subjects</u>	
English	4
Foreign Language	4
Mathematics	4
Science	4
Additional	8
	Total <u>24</u>
 <u>Professional or Technical Subjects</u>	
Design	30
Construction	16
History	8
Drawing	16
Additional	16
	Total <u>86</u>
 Additional in above or related subjects	
	10
	Grand Total <u>120</u>

<u>For Architectural Engineering</u>	<u>Credit Hrs.</u>
General or Academic Subjects	26
Professional or Technical	
Design	16
Construction and Engineering	36
History	8
Drawing	12
Total	<u>72</u>
Additional in above or related subjects	22
Grand Total	<u>120</u>

By the time the student is ready for receiving a degree he must have progressed far enough to be able to solve satisfactorily problems of the first class, that is, single buildings or groups of buildings of importance or other problems in composition of equal difficulty. Construction must have covered theory of stresses, structural design, masonry, carpentry, working drawings, etc. Drawing covered free-hand, descriptive geometry, shades and shadows, and perspective.

None of the schools of the Association adhere entirely to these minimum requirements. In total number of hours all the schools except one offer over 10% more hours than the minimum, and a majority offer over 20% more. Much of this variation is due

to the increasing number of five-year courses.

Due to entrance requirements, some of the schools offer less than the minimum required in the academic group.

The original minimum requirements were considered insufficient a few years after their adoption, and in 1929 we find a new minima suggested. It was based on a four year course of 132 hours, and on a five-year course of 150 hours.

Let us go back to 1919 to see what the American Institute of Architects committee on education reported. This committee was composed of three very prominent architects: Milton B. Medary, Dwight Perkins and Frederick L. Ackerman, chairman. Their opinions should carry some weight. They were very much influenced by the writings on education of John Dewey, one of America's greatest authorities on education. I wish to quote here some of the more important items given by this committee.

"The almost universal practice of teaching design without any contact whatsoever with the world of reality, and of imposing purely academic judgments

upon the work accomplished by the student, develops a set of utterly false values with respect to architecture and the function of the profession in the community. The majority of problems do not even represent genuine situations; they are not related to actual experiences; and the student thus engaged is never afforded the opportunity of actually testing his ideas by application in order to determine for himself their validity. Responsibility of thinking is thus completely suppressed by these false and artificial methods of rating or appraisal. . . .

"Thus architecture is made to appeal to the student as an arrangement of forms rather than an expression, in form, of a dynamic society having social aims and purposes. . . .

"There is little evidence to indicate that collaborative effort is considered of any importance whatsoever. Professional antagonisms are actually fostered through academic jealousies. . . . The academic institutions, particularly those teaching subjects related to art, very generally condemn the products of the world of industry; but no action

whatever is taken toward aiding the student to gain an understanding of our industrial problems which so vitally affect the production of architecture. . .

"Modern education revolves about a system of examinations, ratings, degrees, prizes, scholarships, and medals. These fixed artificial and secondary aims have been pushed into the foreground of educational activities and thus furnish the actual focus of the student's interest. . .

"And when we take into account the entire field of activities and interests which go to make up what we term the vocational education of the architect, the traditional classic introduction of the work, the subdivision of activities into "subjects", the theoretical study of construction, the paper programs, the "problems" developed exclusively through empirical criticisms, the elaborate renderings, the examinations and judgments imposed by others; and the aims of study as represented by "mentions", medals, and prizes, and the all important fact that not one of these educational experiences takes place in the world of reality,--when one takes all this into account, is it not fair to

conclude that about all that we have accomplished through this artificial educational mechanism is the development of clever draftsmen who follow, not lead?

"What we must have--absolutely must have--is an education so staged that the student will learn by experience and contact with the work-a-day world as to what is actually meant by responsibility. He must be induced to find out for himself and, as a result of his experiences, to come to his own conclusions. Is it possible to bring these actual experiences of the world into the school of architecture? No one can possibly answer that question until it has been attempted. . .

"And lastly we must do away with the examinations and imposed judgments based generally upon presentation. The true aims of the profession should be clearly expressed by tests which are set to win scholarships leading to further study. Opportunity should be afforded in a school of research for the architectural student in collaboration with others, to study architecture and art, industry and government, and the

complex forces with which we must contend in directing the growth of our environment." *

Three years after this report was made we find Thomas E. Tallmadge writing that one of the moss-grown theories which architectural education has scrapped is: "It is useless to give practical instruction in the school--all this must be acquired in years of ill paid work in an architect's drafting room."

The question was asked, "Is it possible to bring these actual experiences of the world into the school of architecture?" It is. It is being done in the Bauhaus at Dessau, Germany, and to a certain extent it has been tried in this country at the University of Cincinnati.

At the University of Cincinnati a cooperative system has been introduced in which the student

* "Report of the Committee on Education" by Frederick L. Ackerman, Chairman, Milton B. Medary, and Dwight Perkins, Journal of the American Institute of Architects, Vol. 7 (1919).

alternates his school work with practical work in the field of his profession. The cooperative system had for years been applied with success to the College of Engineering, and consequently when the Department of Architecture was founded there in 1922 it was put on a cooperative basis.

The school work of the first year students is carried on full time, as at any other school. After the first year each student has an alternate. He works four weeks in an office or on a construction job, then returns to school for four weeks while his alternate takes his place. The school year is divided into three terms that cover a total period of eleven months.

The arrangement of the practical work is very carefully worked out to progress from the simpler work to the more complex. The practical work begins with some kind of construction work in which the students work as laborers, time-keepers, carpenter's helpers, etc. The student is brought into close contact with actual building operations, and he soon realizes that buildings are erected by the hands of man as well as by his intelligence. After the experience on construction

work, he moves up to a drafting position in work allied to architecture, such as ornamental iron, terra-cotta, etc., or in an engineer's office. For the average student the practical work of his last two years is in an architect's office performing the regular duties of a draftsman.

The work of securing the positions for the students is carried on by a special department known as the Coordination Department whose staff is properly trained and equipped for this work.

The work of the cooperative system is so interesting that I think it well to list here the present curriculum of the course in architecture at the University of Cincinnati.

FIRST YEAR
For Women--full time

<u>Subject</u>	<u>Credit Hours</u>	
	<u>1st term</u>	<u>2d term</u>
Sources and Development of Art . . .	6	6
1. Historical Background (2 hrs)		
2. Development and Hist. of Art (2 hrs)		
3. Historic Literature (with practice in writing) (2 hrs)		
English--one hr. no credit		
French	3	3

FIRST YEAR
For Women--full time
(Continued)

<u>Subject</u>	<u>Credit Hours</u>	
	<u>1st term</u>	<u>2d term</u>
<u>Principles</u>		
Principles of Design	2	2
Principles of Design (color)	1	1
Principles of Arch.	1	1
<u>Mediums of Presentation</u>		
Freehand Drawing	2	2
Modeling	1	1
<u>Materials</u>		
No specific courses in composition of materials are given in the Freshman year; however, quality of materials is emphasized in connection with the principles of Design.		
<u>Creative Problems</u>		
Not a special course until the 3d and 4th years.		
<u>Other Courses</u>		
Physical Education	1	1

For Men--full time

<u>Background</u>		
Hist. of Anc. & Early Med. Civ.	2	2
Anc. & Early Med. Arts	2	2
Anc. & Early Med. Literature	2	2
French	3	3
<u>Principles</u>		
Principles of Design	1	1
Principles of Design (color)	1	1
Principles of Arch.	1	1
<u>Medium of Presentation</u>		
Freehand Drawing	2	2
Modeling	1	1
Arch. Draw.	1	1

FIRST YEAR
For Men--full time
(Continued)

<u>Subject</u>	<u>Credit Hours</u>	
	<u>1st term</u>	<u>2d term</u>
<u>Materials</u>		
Coordination	1	1
<u>Creative Problems</u>		
Not a special course until the 3d and 4th years.		
<u>Other Courses</u>		
Military Science	2	2

SECOND YEAR
For Women--full time

<u>Background</u>		
Sources and Development of Art . . .	6	6
1. Historical Background (2 hrs)		
2. Development & Hist. of Art (2 hrs)		
3. Historic Literature with practice in writing (2 hrs)		
French	3	3
<u>Principles</u>		
Principles of Design	3	3
Principles of Arch.	1	1
<u>Mediums of Presentation</u>		
Freehand Drawing	3	3
Ceramics Lab.	1	1
<u>Materials</u>		
Same as above.		
<u>Creative Problems</u>		
Same as above)		
<u>Other Courses</u>		
Physical Education	1	1

SECOND YEAR
For Men--alternate
4 wks., class & job

<u>Subject</u>	<u>1st</u>	<u>Term</u>	
		<u>2d</u>	<u>3d</u>
<u>Background</u>			
Hist. of Later Med. & Ren. Civ.	3	3	-
Later Med. & Ren. Arts	3	3	-
Later Med. & Ren. Literature	2	2	-
French	3	3	-
<u>Principles</u>			
Principles of Design	3	3	3
Principles of Arch.	3	3	2
Trigonometry			6
<u>Mediums of Presentation</u>			
Freehand Drawing	2	2	-
Ceramics Lab.	1	1	-
Water Color Sketching			4
<u>Materials</u>			
Coordination	2	2	-
<u>Creative Problems</u>			
Same as above			
<u>Other Courses</u>			
Military Science	2	2	2

THIRD YEAR

<u>Background</u>			
*Sources & Development of Art	8	8	8
1. Hist. Background (2 hrs)			
2. Development & Hist. of Art (4 hrs)			
3. Historic Literature with practice in writing (2 hrs)			
**Post-Ren. & Contemporary Arts	3	3	-
**Hist. of Modern Civ.	3	3	-
**Modern Literature	2	2	-
<u>Principles</u>			
Theory of Arch.	-	-	1
Statics	3	3	-
Graphic Statics	-	-	3
Algebra and Calculus	-	-	6

THIRD YEAR
(Continued)

<u>Subject</u>	<u>1st</u>	<u>Term 2d</u>	<u>3d</u>
<u>Mediums of Presentation</u>			
Freehand Drawing	3	3	-
Outdoor Sketching	-	-	3
<u>Materials</u>			
Coordination	1	1	-
<u>Creative Problems</u>			
Arch. Design	9	9	8
<u>Other Courses</u>			
Mil. Science (Elective)	2	2	2

* For Women

** For Men

FOURTH YEAR

<u>Principles</u>			
Theory of Arch.	-	-	1
City Planning	1	1	-
Mech. Equip. of Bldgs.	3	3	-
Stress, Analysis & Strength of Materials	3	3	-
Elem. Surveying	-	-	2
<u>Mediums of Presentation</u>			
Freehand Drawing	3	3	-
Outdoor Sketching	1	1	-
Modeling	1	1	-
<u>Creative Problems</u>			
Arch. Design	8	8	10
<u>Other Courses</u>			
Military Science (Elective)	2	2	2

FIFTH YEAR

<u>Subject</u>	<u>Term</u>		
	<u>1st</u>	<u>2d</u>	<u>3d</u>
<u>Principles</u>			
Structural Design	3	3	-
<u>Mediums of Presentation</u>			
Freehand Drawing	3	3	-
<u>Creative Problems</u>			
Arch. Design	10	10	-
Landscape Design	3	3	-
<u>Other Courses</u>			
Military Science (Elective)	2	2	-

Let us take a general view of the curricula and methods of the architectural schools to see how the facts presented compare with the criticisms of the report of the American Institute of Architects committee on education in 1919.

It would be extremely difficult to find any curriculum that could be considered typical because of the differences in methods of teaching and the variation of subject matter of courses bearing the same names or similar names at the several schools. However, a review of the curricula of the various architectural courses as they appear in their school catalogues shows that in general the technical subject matter is divided into five main groups. These groups

are drawing, graphics, history, construction and design.

Drawing

The field covered in drawing includes all phases of freehand drawing, modeling, water color, and sometimes oil painting and composition. In the different schools it varies from 4 to 21 per cent of the technical work with an average of 10 per cent. The method by which this subject matter is taught is generally entirely in the hands of the instructors in charge of the subject. And it may or may not be correlated to the rest of the architectural course. The methods in which this work is being presented by instructors has been divided into three types. In one type the student makes a faithful copy of the object before him, in another type technique and skill in drawing are stressed, and in the other, sometimes called memory drawing, the student is shown some objects, then told to draw them from memory, forming a pleasing composition.

The objective of memory drawing or modeling is to develop the mental faculties and the power of

observation of the student. The result is not a copy of some object or of nature, but an expression of them. The development of technical skill is secondary. It is maintained by the instructors who use this method that the student, given the opportunity to exercise his mind and to express himself, will realize the advantage of skill and will strive to quickly acquire it.

This intellectual method of teaching drawing is apparently used at only a few of the schools of architecture. It is used to a certain extent at Carnegie in freehand drawing and at M.I.T. in modeling. It is also used at Armour, both in freehand drawing and in modeling. The University of Kansas is experimenting this year with this method on the Freshmen freehand students.

Graphics

The work known as graphics covers such subjects as descriptive geometry, shades and shadows, and perspective. It varies in the several schools from 2 to 10 per cent with an average of 5 per cent of the technical work. Usually these subjects are taught as three separate courses or they are taught as one course.

Sometimes drafting, use of drawing instruments, and lettering are included in graphics. However, there are schools that omit this phase of graphics, and the students acquire technique and skill in drafting and lettering as they go along, quite as well. The latter method also holds the student's interest more satisfactorily.

At the University of Kansas, shades and shadows, and perspective are included in the Freshman design work. The objective in shades and shadows is to get the student to see how shades and shadows assist in visualizing three dimensional space on a two dimensional picture plane, whether it is the picture plane in the eye or one on paper. The conventional method of casting shadows is supplemented by visualizing and freehand drawing of models upon which shadows have been cast with a high candle power light at various angles. The method of perspective taught is a direct method which is based on the well-known law of optics that the picture plane is always perpendicular to the line of sight. This perspective is applied to the design problem. The student's

visualization of perspective is assisted by the use of models.

At Princeton University an attempt is being made to combine graphics and freehand into a course known as architectural drawing for first and second year students. Exercises in this course consist of representing an object by geometrical projection of it on planes, by freehand sketches, and by a written description.

History

History of architecture covers an average of 9 per cent of the technical work, and varies from 5 to 20 per cent of it. The old idea that the purpose of history was to furnish an architectural vocabulary seems to be maintained to a great extent. There are those, however, who believe that history of architecture should be related to the social, economic, and structural factors that were back of the architectural forms, and that the value of history lies in applying to our problems the deduction of principles that we draw from the past, and in enlarging the student's interest and knowledge in architecture as well as

helping him to cultivate a more refined taste.

The method of teaching history is mainly by lectures and slides, and the submitting of sketches by the student. An attempt at creative work in history is made by the use of archaeology problems, but these problems are usually given in design and much of their value is lost. At Ohio State this work is made a part of the regular history course.

Prof. Hudnut of Columbia believes that archaeology problems have no real value from the point of view of historical study. He also believes that in criticizing architecture of the past there was danger of forming the student's own judgment for him. His idea is that history should be presented as a pageant of life, color, and movement.

Construction

The general subject of construction is complicated by the fact that the curricula of many of the schools have been divided into two separate courses known as the architectural design option and the architectural engineering option. These two options usually lead to different degrees.

The question of the status of the architectural engineering course has been given much thought by the Association. Their records show that in 1921 they gave it the following definition: "Essentially an engineering course giving fundamental and comprehensive training in engineering, and including sufficient preparation in architecture to put the student in full sympathy with the ideals of the architect, but with no attempt to give him facility in architectural design." This definition was rescinded, however, by the Association in 1931, because there was a growing tendency to make no distinction between the architect and architectural engineer.

Each school has attempted to solve this question in its own manner. At Cornell there is no distinction made in the degrees for the engineering option and the design option. A minimum of design and engineering is required with electives in either course to allow the student to follow his individual inclination in his choice.

At M.I.T. it is believed architectural engineering is a separate profession from architecture and students

in the engineering option receive only the architectural design that is taught in the Freshman year.

The school at Harvard maintains that a generous attention should be paid to engineering, even though the architect in the office may hire his engineer later on, and that the use of modern materials should be taken very seriously and investigated.

As in graphics the content of the construction courses has been divided into separate subjects. There are four of them and they are usually known as mathematics, theoretical construction, applied construction, and mechanical equipment of buildings.

In the different schools the subject matter included under construction varies from 7 to 50 per cent with an average of 25 per cent of the technical work in the design option, and from 34 to 68 per cent with an average of 53 per cent of the technical work in the engineering option. There is also considerable variation in the point of view from which this subject matter is presented.

The requirements of mathematics as prerequisites for the other construction courses vary somewhat, but

a very large per cent of the schools require courses in mathematics to include calculus. Two schools require no mathematics in their design options. A few schools have a condensed and coordinated course in mathematics which covers such work from algebra to calculus as will be needed later in theoretical construction. The University of California and Catholic University have such courses. At some schools a part or all of mathematics that is necessary in the theoretical construction courses is included in them. Such is the case at the Universities of Kansas and Minnesota, although at Kansas the mathematics courses up to and including analytical geometry are required for design options, and all courses up to and including calculus for engineering options.

There are many differences of opinion as to the value and amount of mathematics needed in construction. Prof. Kilham at Harvard believes that "all the mathematics actually necessary to the solution of structural problems can be incorporated into the work as it comes." *

* "A Study of Architectural Schools" by F. H. Bosworth, Jr., and R. C. Jones.

The courses that come under the subdivision of theoretical construction are mechanics, statics, structural design, and courses dealing with wood, masonry, concrete, and steel as applied to architecture. The amount of this work varies with the option chosen. At one school the student who chooses the design option receives none at all, while at other schools where the engineering option is chosen the student receives enough theoretical construction to qualify them as structural engineers.

The wide differences of opinion over theoretical construction is summed up in two arguments. The schools that slight theoretical construction in the design option and stress it in the engineering option to the extent of slighting design, maintain that the architect deals only with "art" in architecture and that the engineer supplies the "science" of construction. The schools which slight neither design nor construction in either of the options maintain that a knowledge of structural science is as necessary in architectural training as is that of aesthetic design.

Usually the work in theoretic construction is presented in separate courses and often bearing

little obvious relation to each other. However, they are sometimes coordinated. There are several schools who have these courses in their own department instead of having them in the civil engineering department. Of these schools Harvard, Yale, Alabama, Columbia and Ohio State have succeeded in coordinating this work to a considerable degree by unifying their courses in construction. There is also a tendency for the schools which have the construction courses in their own department to use the problem method instead of the pedantic method.

Applied construction, which deals with the nature of building materials and their details, is included to some extent in all the curricula. The way the subject matter under this subdivision is presented varies from pedantic lectures on and the copying of traditional window frames, wall sections, roofs, floors, stairs, etc., to the creative detailing of new work and an appreciation of the fact that building materials and methods have an important part in building design. Sometimes a small amount of training in office work under the title of working drawings and specifications is included in applied construction.

The subdivision of building equipment includes such subjects as heating, ventilation, plumbing, lighting, etc. These subjects are usually covered very briefly in a manner that only gives the student a little familiarity with their nature and use. Sometimes they are made a part of the study on applied construction. The students taking the engineering option usually go into these courses of building equipment more fully than the ones taking the design option.

Harvard is especially outstanding in its method of teaching construction. A single course in construction covers all its phases and the problem method is used throughout all this work.

There are schools, however, where all the courses that come under construction are distinctly neglected not by credit hours, but by the attitude of the faculty. And, in general the methods of teaching construction have changed but very little since the first courses were established.

Design

Architectural design may be said to be divided into two parts: the course commonly called design taught entirely by the problem method and the course

known as theory of architecture.

Theory of architecture is sometimes included with the course in design in the criticism of the problems. It is, however, usually a separate lecture course covering a generalized theory which supplements the more or less specialized theory that results from the criticizing of a particular design problem.

The amount of time allotted to design varies as it did in construction, due to the two options of design and engineering. In the design option it varies from 24 to 60 per cent with an average of 41 per cent of the technical subjects, and in the engineering option it varies from 0 to 36 with an average of 19 per cent.

The work in design is on a competitive basis in some form or another in every school in the United States, with the exception of Oregon. The competition may be between several schools and their students, as in the schools which send their design problems to the Beaux Arts for judgment, or between a few schools and their students as the annual competition problems between Columbia, Princeton and Yale. Or the competition may be only between the

students within the individual schools.

Columbia, Pennsylvania, Carnegie, Illinois, Georgia, Catholic and the University of Washington are examples of the competitive schools who send their problems to the Beaux Art. And, they base their whole program in design on the Beaux Arts system. There are schools that use the Beaux Arts system, but prefer to judge their own problems and send in only the better ones, if any, to the Beaux Arts. Then there are a few schools such as the University of Kansas, Cornell, California and Minnesota that usually write their own programs and have their program in design on a different basis than the Beaux Arts system.

In the schools following the Beaux Arts method the student usually begins design with some instructions in the technique of drafting and lettering of both small script and of large title plates. He then learns to copy the orders and other classic details very carefully, and to render them with monochrome washes. This is followed by problems in analytique which are exercises in designing small architectural motives and which are presented in a rendered compo-

sition with some supplementary details.

From this the student passes on to class "B" and finally to class "A" design. He solves the problem as set forth by the conditions and requirements given to him in the program by first preparing a preliminary sketch, usually called an esquisse, in a required time, usually twelve hours, without the opportunity to investigate the problem, use notes, or the library. This sketch shows the general scheme and form of his building, and he must not vary from it in general. Then a few weeks are spent studying the problem before the final rendu is made.

This system which is called the "Beaux Arts System" has not changed any appreciable amount in the past thirty years. Not all schools adhere strictly to this system, however, as we noted in our discussion of Oregon and Michigan on Pages 34 and 35, and we shall see that there are also others. At Oregon no esquisse is required. Some of the schools are experimenting in extending the time allowed for the esquisse and allowing the use of the library or any other helpful source of information while taking the esquisse.

There are a few schools that do not start their beginning students in design with the "orders". At Cincinnati and Florida the approach to design is by means of a series of exercises in abstract design. The attempt is made to get the beginning student to understand the principles of design before he applies them to architecture. When these exercises in abstract design are only two dimensional, as is apparently the case at these two schools, there is a possibility of such work having a tendency to lead the student toward "paper" architecture.

At Cornell, Southern California, Yale, and Princeton the course in design begins with problems of buildings simplified in their requirements. The student learns the technique of drafting as he goes along with his design work. He learns to a certain extent the elements of architecture by application of them in a building.

At Pratt Institute the beginner in design is given a practical problem of designing working drawing details of some architectural motive. The student there is apparently free and unhampered by the

practicality of the problem, and instead it seems to make the problem more real and interesting to him. He learns the practical side of design incidentally to learning the theoretical side.

The beginner in design at the University of Kansas starts with what might be considered a three dimensional abstract design of a building. The attempt is to get the student to visualize a building in its totality. Plastic models are required for studying the problem. After the study in volume of several problems of single buildings with use of models, perspectives, and direct elevations, the student starts on simple plans and group plans in block form. The problems are usually short and many problems are given. There is no limit placed upon the thought that may be put into these problems except that placed by the individual ability of the student, however there is a time limit in which he must make a rendered presentation. The student learns to draw and letter as he goes along, and composition is studied in rendered presentation of the plan, elevations, and perspective. The first year design work

is on a noncompetitive basis as far as giving mentions goes, but all students take the problems together at the same time.

From the simpler study of volume and plan of the first year design, the student progresses gradually into the study of materials, detail, and of more complicated problems. Carefully written programs are given to the students at first, but in the fourth year of design the students usually write their own programs. A thorough investigation of the problem is encouraged. The preliminary sketches are made with free access to the library and files. The student is given from a few days to a week to prepare the preliminary sketch which in most cases turns out to be a well thought out first study. No exact adherence to this study is required of the student as he progresses with the study of his problem, however, the student usually adheres to his first study. This may be due somewhat to a feeling by the student that it is desirable to retain the Beaux Arts idea of adhering to the esquisse, but it is much more likely that the additional study on the preliminary has allowed the

student to grasp the problem more fully and to arrive at a more nearly logical sketch. Plastic models are used for study consistently throughout the four years of design although they are only required in the first two years.

There are some schools where there is no unified and directed progress from elementary design to advanced design. Each instructor writes his own program and teaches the subject in his own manner, stressing the things he considers important. He does not coordinate his work with either what the student has had before or what he will have later.

The rate of the student's progress in design is somewhat dependent upon his ability as most schools have some kind of point system similar to that established at Columbia in 1906. The schools who send the problems to the Beaux Arts for judgment often base the promotion of the student on the awards he has received from that organization.

The so-called noncompetitive system of teaching design at Oregon is so interesting that it deserves further consideration from that given on Page 35.

At Oregon the students in design are passed from one grade to another upon completing a given number of points. But these points are not based upon a given number of award values, they are based upon the satisfactory solution of a certain set number of problems. (However, due to University regulations, grades other than satisfactory must be turned in to the registrar's office.) Whenever the student feels that he has gained all that there is for him to get out of the study of one problem and his work is considered satisfactory to the faculty, he goes on to the next problem, regardless of whether the other students have or have not finished their problem. The problem, in fact the whole series of problems that the student takes, is made a means to an end and not an end in themselves. What the student acquires from any or all of the series of problems depends entirely upon his ability and interest, and upon the knowledge and enthusiasm of his teachers.

At Oregon the elementary design of the first year is taught by simple problems in composition of elevation and details with attention paid to materials and function. The second year design takes up the

simple plan, and the third, fourth, and fifth year design takes up larger and more complicated problems. Collaborative problems with the allied arts are frequently given.

One might go on to write praises of the non-competitive system, but it is sufficient here to note that it works successfully. It can be judged by the quality of its graduates. It eliminates early in their college years the students who are not seriously interested in improving themselves.

At a number of the schools the course in design is brought to a close with the presentation of a thesis by the student. This thesis is often only the last regular problem in design which must be passed satisfactorily. Sometimes it is a special prize problem. There are a few schools such as Yale, Harvard, Princeton, Cornell, and George Washington that require the student to work out his own program, to investigate his problem both by literary research and by visualizing similar types of existing buildings, to analyze his problem, and to design it as a result of his investigation and analysis.

The considerations given to structural and mechanical details vary with the different schools. At Harvard the thesis covers the solution of the economic, social and financial questions as well as the structural, mechanical, and design question. This latter type of thesis is an attempt to round out the technical training of the student and to give him a taste of the practical side of architecture.

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THE DIFFERENT SYSTEMS
OF
ARCHITECTURAL TRAINING

III

The architectural training of the past and the present has been carried on by the following methods or a combination of them: apprenticeship, ateliers, pupilage, the German "Bauhaus" and the American College system. There is no question that each of these methods has its good points, but likewise has its faults.

Apprentice System

In the apprentice system the young man who aspired to become an architect hired out to a practicing architect for a very small salary, or perhaps at first he worked for nothing. His duties first may have been that of office boy. Then he worked up to be a tracer. At this task he spent hours and hours drawing over the work of others, and thus he was supposed to learn by doing. And so on up through the positions of the architect's office, whatever he learned was by this method.

The apprentice must have been handicapped somewhat by a lack of breadth of view because he had little opportunity during his apprenticeship to study architecture other than as it was practiced in the offices in which he worked. There is a tendency for the apprentice to develop technique and ability to copy the work of others to the detriment of developing taste and originality. Unless the apprentice has already had a background of higher education there is very little opportunity of his gaining the mental enlightenment and refinement that an architect should have. If we go back to Vitruvius, the oldest known authority on architectural education, we will find that he wrote that both practical and theoretical training were necessary. The apprentice system does not usually consider theoretical training at all.

The economic situation of today does not favor the apprentice system. It is a well-known fact that the architect seldom has the time nor does he take the time to enlighten his men at any length. The architect wants men in his office who can work with him and not for him as the young apprentice will

necessarily have to work.

Atelier System

The atelier system as it was developed at the Ecole in Paris and as it is at present fostered by the Beaux Arts Society is well known to every architect and architectural educator in this country. With the brief discussions of this system that has gone before, it is not necessary to consider it further as a method. But a little criticism of its faults is worth while. The success of any atelier is dependent almost entirely upon its patron. The patron should be a man of wide practical experience, much architectural talent, and striking personality. The atelier as it is usually considered covers only one phase of architectural education, that is, design, and there is apparently very little attempt to relate it to the other phases. Since the ateliers of this country are an indirect product of the Ecole in Paris, the criticisms which apply to their teaching of design are very similar to the observations of the Ecole's teaching of design that were made on Pages 21 and 22.

The system of competition that has been set up by the ateliers is not entirely wholesome for the student. It places the winning of prizes, mentions, etc., ahead of the value that is gained from studying the problems. It makes the problem an end in itself instead of a means to an end. The success of the atelier is dependent upon the prizes won, and, as in commercial competition, fair or foul means are likely to be employed to win these honors. Although the winning of prizes means encouragement and glory to the winner it has a different effect on the loser. There is a tendency to create a "superiority complex" on one hand and an "inferiority complex" on the other. Dr. Walter B. Pitkin of Columbia University in one of his attacks on the evils of competition has said: "We must not be deceived by ballyhoo, the spotlight and the peculiar artifice of our competitive system which exalts the man who comes in first and ignores him who comes in second or third." *

* "Psychology of Achievement" by Walter B. Pitkin.

Pupilage System

The pupilage system as it was adopted in England in the latter part of the eighteenth century was somewhat of a combination of the apprentice system and the atelier. The young man who wished to become an architect apprenticed himself to an architect who headed what was known as an academy. The architect received a certain fee from each student for his tutoring, and in addition to this the architect received without pay the services of his pupil in his private practice. The student received lectures on architecture, took problems in design (such as they may have been) and did practical work in the architect's office.

This type of training was apparently successful in many ways, and it was only with reluctance that it was given up in England in the latter part of last century. However, it may be criticized in that it failed to give the architect other than a narrow professional training. In this training contact with engineering was apparently lost sight of for the first time, for we find engineering becoming a

separate profession, and the Victorian idea that architecture was the decorating of buildings.

The German Bauhaus

The architectural training given in the German "Bauhaus" (which means German architectural school) is somewhat of a combination of the training given by a pupilage system and the typical college system. The German and Austrian architectural schools which are very similar are not a part of their universities. They are separate schools of equal rating with the universities. The students attend lectures in both the nontechnical and technical subjects; they work out theoretical problems in the technical subjects; and as a part of their regular school course they work as apprentices for the architectural professors who also carry on a practice of architecture in addition to teaching. The course in architecture in the German schools is usually five years in length. The first three years compare somewhat with the undergraduate work in the American schools of architecture. The last two years are known as the master school and compare with our graduate work. It is in the last

two years of the German schools that most of the apprenticeship work is done. In this apprenticeship work the professors share the architectural fee with the students.

Let us examine briefly the Bauhaus at Dessau, Germany. The Bauhaus has not only a course in architecture but courses in the allied arts. The entrance requirements for the architectural course are that the student must have completed the German secondary schooling, be eighteen years of age, and have shown a natural ability for architecture. Applications for admission must be in writing, and must cover thoroughly the life history and preparation of the applicant. The director of the school decides upon who should be omitted.

The studies at the Bauhaus are divided into general and special fields. Some of the subjects in the general field that the architectural students take are psychology, knowledge of materials, lettering, color, descriptive geometry, mathematics, etc. In general it may be said that these subjects are similar to those we classify in the American schools

as nontechnical. The special field in architecture is similar to our technical work except that more attention is given to structural engineering courses, and in addition the students attend workshops for carpentry, metal work, etc. The theory given in technical subjects is supplemented by practical application in experimental drawing and modeling. Whenever possible, during the vacations, the students are expected to find practical work with an architect or in allied fields.

The first semester's work is considered an introductory course. With sufficient outside preparation this first semester's credit may be omitted on a certificate of a certain amount of outside work. The amount of credit to be allowed is determined by a conference of the faculty.

Compulsory attendance of classes is required for the prescribed subjects in the architectural course. Promotion from one semester to another is based on a successful attendance at classes and on the ability shown by the student's individual work. On completing the prescribed course, the student

receives a certificate saying that he has taken the course. But if he has also shown good ability and individual work of a high standard, he receives a diploma.

The aims of the Bauhaus at Dessau are:

1. "To serve the development of housing from the simple utensil to the finished house.
2. "To arrive at the forms created through a systematic investigation in practice, as well as by the theory of their natural functions and purpose.
3. "To play its part in the evolution of a new type of worker who is equally expert in both the knowledge of form and technique." *

So much stress is placed on models at the Bauhaus that it might be said to consist principally of a series of studios in which the students study, carefully make, and constantly improve models of typical objects of everyday use in their respective fields. A close relation is maintained between the making of these models and mechanical means of mass production.

* "Passing Through Germany" (1927 Edition).

With the belief that the modern man needs to live in an environment which harmonizes with present conditions and that everything he uses should be based on these conditions, there is a definite search at the Bauhaus for the essential character of each object, building, etc., as well as the study of modern materials and methods of construction. "The manner in which the designer assembles the various elements, such as proportions, materials, and color, determines the character of the object." * It is believed that "Only by keeping in close contact with the development of technical methods of production and the inventions of new materials, can the designer retain his capacity for bringing our age into proper relation with tradition." *

There is a tendency for this attitude to lead to an overstressing of the machine side of architecture. But on the other hand the good points of the Bauhaus are:

1. The principle of imitation of the past never

* "Passing Through Germany" (1927 Edition).

enters the course of instruction.

2. Special emphasis is given to city planning.

3. Design is based entirely on contemporary means of production.

4. The students are brought definitely into connection with contemporary painting, sculpture, theatre arts, publicity, music, and literature.

In the United States the school at Los Angeles headed by Richard J. Neutra follows the Bauhaus methods of teaching architecture.

The American College System

We are all familiar with the American College System with its academic hours of mathematics, rhetoric, etc. This same parcelling out of courses was continued over into the architectural schools as they were established, and we find the courses in architecture divided into technical and nontechnical subjects. These in turn are divided into groups, and the groups into separate courses of so many hours of this or that. The Association of Collegiate Schools of Architecture have at one time, attempted to set a standard of the number of hours in each of the different groups.

This was abandoned because it was realized that the real question of education is not concerned with labels and that the number of hours do not indicate the real educational value of the course. The schools of the Association have continued to teach the subject matter under each label in their own manner. The presentation of the subject matter varies with the personality and training of the teachers and educational policy of the school. Herein lies the real question of education. How is this or that subject matter to be presented and what is its relation to the rest of the course?

"The cause of the confusion resulting from multiplication of studies and variation in the subject matter of every single study, is adherence to a traditional classification and division of isolated subjects; to lack of taking account of correlations and interdependencies which actually exist among them." *

From the general view of the curricula presented

* "The Way Out of Educational Confusion" by John Dewey.

in the previous chapter we can get some idea of the variation in the method of presentation of the subject matter in the different groups of the architectural courses. There is a striking note of the lack of correlation of the groups in a majority of the schools. There is also, in many cases, a lack of correlation within the groups and it is especially noticeable in the groups of graphics and construction.

In the design courses which followed the Beaux Arts system the break between analytique and class "B" design is usually overlooked. But here is a break in design that deserves the sharpest criticism. The student in elements of architecture learns a vocabulary of architectural details by coldly copying them. In analytique he applies this vocabulary, develops his skill in drawing, rendering, and making a pleasing composition, and incidentally he is supposed to study proportions of the details he employs, and develop an appreciation for ornament.

This study to a large extent is carried on as though architecture were of two dimensions instead of three. Then from this two dimensional study the

student jumps to class "B" design which requires a three dimensional study. The tendency is for the student to continue to study in two dimensions only, and he is likely to study plan and elevation as two separate and unrelated parts of architecture.

Very little has been said about the nontechnical courses, but it can readily be seen that there is little possibility of their being correlated with architecture, when at some schools these courses are made a part of the entrance requirements, and at most of the others they are taught in their separate departments as individual courses.

From the curriculum of the University of Cincinnati, which was given on Pages 52 to 57, it may be noted that there is an attempt to coordinate to a certain extent the nontechnical work in History to the technical work of History of Art. This work is given in different departments but it is so arranged that the historical periods of each is studied at the same time.

The study of architecture is not one that lends itself readily to the rigid discipline and the

competitive grading of the American College System as it is known today. Grades like prizes have a tendency to make the student strive for honor instead of striving to get the most out of his study, and a tendency to make the course an end in itself instead of making it a means to an end. The proper educational approach to architecture is decidedly different from that of the American college system. The architectural school should train the student to develop for himself a process of mental organization by which to attack the problem before him instead of teaching him to memorize an unrelated group of details and facts that are given in the many different courses that he takes. The student should be taught to attack the problem before him as a totality before attempting to solve the details. There is an aimlessness in the various courses in both the technical and nontechnical groups when each subject has been treated as though it were complete in itself, beginning and terminating within limits fixed in advance.

I wish to quote again from John Dewey's book on "The Way Out of Educational Confusion" to show how he considers that these subjects may be treated.

"A reorganization of subject matter which takes account of out-leadings into the wide world of nature and man, of knowledge and of social interests and uses, cannot fail save in the most callous and intellectually obdurate to awaken some permanent interest and curiosity. Theoretical subjects will become more practical, because more related to the scope of life; practical subjects will become more charged with theory and intelligent insight. Both will be vitally and not just formally unified."

The technical courses may to a large extent be combined into one course and taught by the problem method, and without relation to academic hours and grades. If I may refer to Vitruvius again, it may be noted that the nontechnical or cultural subjects that he considers essential in the architect's education covered a wide field, and also that he related them to architecture. All the courses that architectural student takes should have one objective and that is to make him more nearly fitted for life in general and the particular place he is going to occupy in the profession of architecture.

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A DISCUSSION OF A SCHOOL
FOR
CONTEMPORARY ARCHITECTURAL TRAINING

!!!

We have reviewed the education of the architect and his status in the past, and his present scholastic training. In this review it was attempted to point out in general both the fallacies and the good points of the architect's training. Keeping in mind all that has gone before we are ready to discuss a school for contemporary architectural training. The problems that confront us in this discussion will be divided in a general way into the purpose of the school, the administration of the school, the entrance requirements and size of the school, the faculty, the curriculum, methods of teaching, and equipment.

Purpose

The primary purpose of this proposed architectural school will be to give the necessary instruction to assist young men and women to educate themselves to become architects, and to help them adjust themselves to life in general.

What do we mean by "architect"? What is the present day status of the architect? The answer to that question is a thesis in itself. The question cannot be fully answered here. The profession of architecture in this country today has not as yet come to any definite conclusion as to the status of the architect.

The American Institute of Architects in their documents have set forth that, "The architects' professional services consist of the necessary conferences, the preparation of preliminary studies, working drawings, specifications, large scale and full size detail drawings; the drafting of forms of proposals and contracts; the issuance of certificates of payment; the keeping of accounts, the general administration of the business and supervision of the work. . . ." *

As vague as it may seem, this scope of the architect's services is about as near as we can come to defining his status; any addition would only be

* "Handbook of Architectural Practice" by The American Institute of Architects.

tentative. The individual architect may not be master of all the special problems of building, such as financing, lighting, heating, mechanical equipment, etc., but he should know enough of each of these to collaborate harmonisouly with specialists in these allied fields.

". . . It is no longer possible for any man personally to know all of the things and do all of the things that enter into a building. But he must know enough about each of the special items to be able to select intelligently the various experts employed for the particular problem, to weigh and judge the information they give him and to correlate the whole job." *

The secondary purpose of the school is divided into two parts. One part of this purpose is to give architectural training to those who are interested in the other phases of the building field such as contracting, building financing, producing and selling

* "The Function of an Architect" by Arthur C. Holden, Pencil Points, Vol. 12 (1931).

of building materials, real estate developing, special phases of engineering closely allied to architecture, etc.

The other part of the secondary purpose is to further the public's appreciation of architecture. In an indirect way much can be done to increase interest in and understanding of architecture by encouraging students in other departments and schools to take work in the architectural school as an option, and as a means of increasing their liberal education.

The Administration of the School

Since the first architectural courses were established in this country in the latter part of the last century there has been a tendency for the architectural departments to strive to become separate and independent schools within the universities. In some ways this has been fine, because when many courses were formed as a part of the engineering schools they were hampered by certain academic requirements that were already established. Architectural departments that are a part of the fine art schools are also hampered in some cases by the lack of understanding between the department and the school. In the cases where admin-

istrative difficulties exist this lack of understanding between the architectural departments and the schools to which they are attached is largely the main source of trouble.

One prominent architect in this country would concentrate all the architectural training into about six special schools located in the larger cities. This would have the advantage of the possibility of the school having direct connection with prominent architectural firms. In addition to this he goes on to tell over a hundred different branches of knowledge in which the architect must be well informed. This is all true, but how are you going to teach a student what to think in so many different branches in a special school? Would it not be better to give the student a liberal training in higher education, teaching him to think in broader terms of life?--". . . for education is still the formation of character, intellectual, moral and aesthetic, not just training in skills and the impartation of information." *

* "Higher Education Faces the Future" by John Dewey.
Edited by P. A. Schilpp.

If we are to accomplish this liberal training we must locate our school or department in an established university whether or not it is in a large city or a small one. The faculty of the architectural school should have the freedom of making their own entrance and graduation requirements, of determining the subject matter of their course and the method of presenting it, and of collaborating with other schools or departments in special problems and optional courses. If the faculty is allowed this freedom and is responsible, through its head or dean, only to the president or governing body of the university, it will matter very little whether the course is called a college, school, or department of architecture.

The matter of collaborating with the other schools or departments in the university is something that can not be too greatly stressed. It is hoped that the architectural students may do a few collaborative problems with the engineering, the landscape architecture, and the allied art students. It is certain that a mutual understanding and cooperation must be maintained between the several faculties of the university.

In considering the amount of freedom that should be allowed to the faculty of architecture the question will arise as to whether the architectural school will be in an endowed university or a state university. It is realized that in many ways state university rules will conflict with some of the ideas of my proposed architectural school. According to Abraham A. Flexner our universities have many faults that should be corrected. However, I shall not attempt to give any correction for them, and realizing that they do exist, I have, in general, disregarded in this discussion the universities' academic rules altogether.

Entrance Requirements
and
Limitations on Enrollment

In the study of the architectural schools of today in this country it was found that most of the schools required for admission a certificate from an approved state high school or an equivalent secondary school. Others required that the certificate be from an approved secondary school without any reference to the state high school system. Some permitted entrance by examination only. A few schools required

two years' work in an approved college, and one school, Harvard, required a bachelor's degree from an approved college. In addition to these requirements certain schools maintained a personal selection. It may be noted that in general the state architectural schools required only the certificate from an approved state high school or an equivalent secondary school. The endowed schools were usually the ones who had the additional requirements.

The personal selection is the only requirement that I wish to retain in my proposed school. Of course, this is opposed to the state schools' open door policy of admitting all who come prepared with the approved secondary schooling which, according to Abraham Flexner, may mean almost anything. It must be granted that the open door policy is quite democratic in the sense that democracy is thought of by the masses. Jefferson thought of democracy in education in quite a different manner from that of the open door policy.

". . . Jefferson emphasized the young men's value to society, not their natural right to an

advanced education." *

The ability of the student who wishes to pursue higher education in such a field as architecture and his value to society after receiving this training must be taken into account.

The advantages in having more mature students by requiring two years of college work, or a bachelor's degree before entering architecture is appreciated. But such a procedure seems to definitely divide architectural education into what is known as cultural training and technical training. It seems to say, this is cultural or liberal and that is professional or technical, without taking into account the correlations and interdependencies which actually exist between them. I know of no other profession that is (or should be) as closely related to life in general, to the economic, social, and spiritual factors of life, as architecture. Then, how can we, to the best advantage, follow along one course and say this

* George Edgar Vincent in "Higher Education Faces the Future." Edited by P. A. Schilpp.

is cultural, and then definitely switch to another and say this is technical?

I wish to advocate that for admission to my proposed school, age limits and academic requirements of credits or hours be omitted. When the student has arrived at his own decision to study architecture and has shown that he has the ability to pursue this study he is then ready to make application for entrance to the architectural school. The faculty of the architectural school exercising their duty of personal selection with consideration of the student's personality, his ability, and his possibilities, as near as they can be predetermined, of securing work in his chosen field and his value to society when he has completed his scholastic training, may accept or reject the student's application. Should the student's application be rejected, this does not mean that the door to architectural training will be forever closed against him. He may try again.

It is doubtful if any student will make application for entrance before he has begun his secondary

educational training, and only a few, the more talented students, will apply during their secondary educational training. Many students do not decide to study architecture until after they have had a year or more of college training. This leaves the individual the freedom of several years in which to choose whether he will study architecture. The advantages in allowing the student with ability to begin his architectural training at an early age are the same advantages as in early art training; the mind of the student is more flexible; there is a freer desire for self-expression; there is more opportunity to correlate his secondary education with the study of his life work. Of course, the question will be asked, what is to become of the courses that the student would have taken in his secondary education if he takes up the study of architecture at an early age. There is no reason why the student should not continue to take them along with his work in architecture, and with an ever increasing realization of their value. When he has completed his secondary studies he will begin the liberal training in college that will be dealt with

later. It must be remembered that the study of architecture provides a liberal as well as a technical training.

The question of limiting the enrollment of the school is quite involved. Some of the architectural schools of today limit their enrollment to men students, and a few limit the total number of students or the number of first year students. And again these schools that limit the enrollment are usually the endowed schools. With but few exceptions, the schools that limit the total enrollment have a limitation below the average of the architectural schools of this country. The number of students enrolled in architectural schools should depend upon their ability and the need of the profession of architecture for replacements. The first one can be taken care of directly by the faculty of the school, but the second would require a thorough study by a statistician. It would perhaps be better to limit the enrollment to the approximate group that the faculty considers the best with which to work, then have the profession limit the number of schools and their location with consideration of a statistical study of the need of

the profession for new men. The difficulty of carrying out this last statement is realized when we consider that a majority of the architectural schools are located at state universities or state colleges, perhaps controlled somewhat by politics, and with a certain degree of competition between themselves and universities and colleges of other states.

A school with approximately eighty students seems to be the most convenient size. With this figure set as the limit of total undergraduate enrollment for our proposed architectural school, it may be assumed that the limit on first year students would be approximately twenty, however, this is only a tentative figure for the first year students, and may have to be changed from time to time. There should be no limit on the number of graduate students allowed to enroll.

If women students have the ability and the desire to study architecture they may do so at this proposed school. They may have equality in opportunity with the men students, but having been granted equality they shall have no privileges over the

men students.

The Faculty

In architectural training the faculty is far more important than the curriculum or any other academic factor. In the discussion of the atelier system on Page 81 it is noted that the statement "The success of any atelier is dependent almost entirely upon its patron," was made. This principle also applies to any school; the success of the school is dependent to a great extent upon its faculty. ". . . The system is of secondary importance. A great teacher will vitalize any system, just as a mediocre teacher will make any system a mediocrity." *

For my proposed school I have chosen a faculty consisting of eight full time members including the head or dean as the case may be. This is allowing one professor to every ten undergraduate students. Of course, I do not mean to portion out ten students to this professor and ten to that one, etc.

* Dean Ellis F. Lawrence, School of Architecture and Allied Arts, University of Oregon.

Although a system such as this might have many advantages, it would be very difficult to find teachers with such all around qualifications as would be necessary to carry out such a system. The ratio was given in this manner, merely to allow a comparison with the following present day architectural schools:

<u>School</u> *	<u>No. of students</u>	<u>No. of full time teachers</u>	<u>No. of part time teachers</u>
Harvard	56	11	1
Cornell	133	11	4
U. of Penn.	280	28	-
Princeton	54	7	4
U. of Michigan	279	29	-
Catholic U. of Am.	35	4	1
U. of Oregon	96	6	6
U. of Kansas	74	3	2 **

* "A Study of Architectural Schools" by Jones and Bosworth.

** There are only three full time teachers in the architectural department at the University of Kansas. The notation of two part time teachers was allowed because it was considered, that as far as the

The average of the ratio of teachers to students in all of the schools covered in "A Study of Architectural Schools," assuming two part time instructors equivalent to one full time instructor, is approximately one to fifteen. It can be seen that in general the endowed schools are less in ratio than one to ten, while some of the state schools are approximately in the ratio of one to ten, and others are very much over this ratio.

It is desirable that these eight faculty members be men who are primarily educators, but who have had several years of practical experience in the profession of architecture. They should all have had a general architectural training and should have specialized either in school or practice, or both, in the

department of architecture was concerned, the regular faculty member of the School of Fine Arts who taught freehand drawing to the architectural students, and the faculty member of the Civil Engineering Department who taught architectural engineering courses, were part time teachers.

particular phase of architecture in which they will be called upon to give advice to the student. In each of the following special phases of the study of architecture there should be one member of the faculty who is more proficient in that particular phase than any other member of the faculty:

1. Administration
2. History
3. Space Relations
4. Architectural materials
5. Means of expression
6. Structural engineering
7. Mechanical equipment of buildings
8. Professional practice

The question may arise, what of the social and economic factors in architecture, as I have not listed a specialist in either of these. These two factors are considered a part of the general architectural training. All of the faculty should be well informed in these factors to the extent in which they are involved in and are related to their particular phase of architecture.

The faculty member especially proficient in administration should, of course, be the dean of the school or the head of the department of architecture. This position will call for a man well qualified in architectural knowledge in a general way, and to a certain extent, in all the special phases; a man who has had broad experience in the practice of architecture; and a man with several years of teaching experience. His main duties will be to coordinate, to bring into harmonious adjustment the faculty and to act as chief liaison officer between the school, and the public, the profession, and the departments of the university. He should also be a natural psychologist, for much of the personal selection considered under "Entrance Requirements" will depend upon him.

There is a growing tendency among the architectural schools for the dean or the head of the school to not have any classes to teach. The value of this is realized, but on the other hand, perhaps the dean may lose that close relationship between the architectural student and the faculty, which is so desirable. However, this is a problem for the dean

to settle for himself, because it is doubtful if any two faculty members would arrange it in the same way. Being very much a business man, the head of the school might conduct a seminar with the objective of getting the student to realize that the architect cannot practice architecture unless he can first get business, and to instill in the student the desire to find out how he can get business and to guide his efforts.

The chief duty of the faculty member who has specialized in history will be to teach history of architecture. This will require a man who not only has a well rounded knowledge of architecture in general, and has specialized in the history of both contemporary and ancient architecture, but has given special study to both historical and contemporary philosophy, civilization, art, and literature. In addition to teaching history to the regular architectural students and collaborating with the rest of the faculty, the professor of history will offer optional courses in the history of architecture to students in other departments of the university.

In as much as the real end and aim in archi-

ecture is to inclose space in the way of a building which will serve human needs, and do it in a pleasing way, there is a need on the faculty for a member who is proficient in teaching space relations. This will require a man who is well versed in the spacial requirements of the many types of buildings; who has a feeling for unity, good proportion, scale, and both two and three dimensional composition; and who thinks of the spacial requirements mainly in terms of volume or three dimensional form. The professor of space relations will be in charge of and will collaborate with the other faculty members in working out the program of problems that the student will take.

In historical times, the architectural materials were usually either stone, brick, plaster, or wood in some form, such as were found in the vicinity of the site. The durability, stability, and aesthetic qualities of these materials were understood by the architects as nearly as was possible considering their limited means of investigating them. Today, we have a large number of new materials and new ways of using old materials, with no limitations to localities, and

with unlimited available means of investigating them. There is an exceedingly great need of giving these new materials and new uses some consideration in the study of architecture which has not heretofore been done to any great extent. Therefore, I wish to have on the faculty of my proposed school a member to teach the durability, stability, fitness and aesthetic qualities of architectural materials.

Such a professor would have to be a man who in addition to previous architectural training, has had a number of years experience in one or more of the following: inspecting buildings under construction, writing specifications, or selling materials. He must know the aesthetic qualities of the many present day materials, their values as to color and texture, how they act under light and shade, realize that each material has a "mass" quality of its own, and know what combinations of materials can be made both from a scientific and an aesthetic point of view. He should know the durability and stability of the different materials, how they weather, the aesthetic qualities of weathering, and how impervious they are.

He should also know the acoustical and insulating value of such materials used for those purposes.

The phase of architecture that I have named "Means of expression" consists of the several ways, with the exception of speech and writing, in which the architect expresses his ideas. This would include such methods as mechanical drawing, freehand drawing, water color sketching, rendering, modeling, etc. The teacher of this phase of architectural training should be a man who has had practical experience in architecture or a general architectural training, who has a natural artistic ability, and who can inspire the students to express themselves in whatever medium they may be using. He should also have a knowledge of true perspective in order to teach the students to think in perspective.

Since all engineering was formerly a part of architecture, and since that phase of engineering which deals with the structural factors in buildings is such an inseparable part of architecture, I wish to have on the faculty of my proposed school a member who in addition to having had a general arch-

itectural training is qualified to teach structural engineering. The scope of his work will include instruction in theoretical and applied engineering, and he shall confine his instruction to present day engineering and architecture, with an ever open mind to consider new methods in engineering. Antiquated methods of engineering shall be left to the professor of history to discuss and to relate to their proper place.

Probably one of the hardest places to fill on this faculty will be that of the teacher with a general architectural training and special training in the mechanical equipment of buildings. This position will require a man with not only the theoretical and practical knowledge of plumbing, heating, refrigeration, ventilating, wiring, lighting, elevator service, telephone service, etc., but also a knowledge of the aesthetic qualities that can be obtained in good design of radiators, grills, lighting fixtures, bathroom fixtures, elevator cabs, telephone cabinets, etc.

The last faculty member on my list, and probably

the most important from the point of view of the practicing architect, is the professor of professional practice. His training should consist of several years of practice as an architect. The scope of his duties will consist of instruction in the duties of an architect, preparation of contract drawings, specifications, superintending, architectural law, financing of building projects, estimating the cost of buildings, relation of the architect to his community, and operation of the architect's office.

Now that we have established a faculty, all endowed with a general knowledge of and training in architecture, and each with special qualifications in his particular phase, we must remember that it will be necessary for them to maintain the closest coordination and collaboration that is possible in their work. Each member should keep well informed on the latest developments in his special phase, and there should be a continual exchange of ideas among them to keep the others informed on new thoughts that are not in their special field. Frequent group meetings will be necessary, not for

administrative purposes, but for collective discussions and interchange of ideas.

As a word of advice to my faculty I wish to quote from one of our prominent architects of today, Eliel Saarinen.

"The function of the school is to develop, besides technical and historical instruction in the students:

1st--their artistic intuition;

2d--their sense for the spirit of the time;

3d--their instinct to translate the spirit of the time in an expressive architectural form;

4th--their sense for truth, ethics and logic in architecture;

and finally--their creative imagination.

Creative because art is always creative in every moment and at every point. And the devil of copying has to be kept far from the schools.

"Do not kill the intuition with theories. Art based on theories is a dead art.

"Do not teach theories of proportions.

"Do not teach theories of color.

"Do not teach the students the Greek form language before they understand their own form language.

"Do not teach style in connection with design." *

Although the student will need advice and guidance, the main problem for the faculty is not to teach the student what to think, nor how to think, but to think in terms of architecture. The student should be taught to develop for himself a process of mental organization by which to attack the problem before him; a process whereby he analyzes the problem, investigates it, and correlates the various parts to each other and to the whole; gives aesthetic consideration to proportion, and to the materials and details to be used; applies intelligently his structural knowledge and knowledge of mechanical equipment; sees that the social and economic factors are solved; and crystallizes the whole into a unified logical solution.

* Address by Eliel Saarinen from "Proceedings of the 64th Annual Convention of the American Institute of Architects."

The faculty will not be denied the opportunity to carry on their own private practice. However, they should not expect to be permitted to carry on a private practice during the school year on the competitive basis in which private architectural practice is now maintained. Private practice maintained during the school year shall be carried on as a part of the educational policy. The faculty will have their offices in the school and the advanced students will associate with the faculty in carrying on this private practice. The student and faculty member will share the fees in proportion to the work done by each.

This association of the faculty members and students on actual problems of architecture places the student not as an apprentice to the faculty member, but as an associate with him and with proportional responsibilities. It should put a zest into the student's work that could not be accomplished otherwise. It gives an opportunity for the mingling of the theoretical and the practical; an opportunity for the breaking down of the imaginary boundary line that exists today, between the theoretical and practical, and is hampering architectural education.

It is not desirable nor in the least probable that all the work of the advanced student should be carried on in this manner, but certain objectives in the advanced work could be more effectively attained in this manner than in any other way.

The value of having the faculty keep in touch with the practice of architecture must be realized, for even though the primary purpose of the faculty is to educate the individual student, to know him, and to teach him to think in terms of architecture, the faculty must be not only closely acquainted with the methods of teaching, but with the terms of architecture in which they are teaching the student to think, and with the position in the field of architecture for which the student is being educated. The faculty member who does not carry on a private practice in association with the students during the school year, or who does not have any connections with the practice of architecture during one half of his summers will be required to spend one year, out of every five or six years in some connection with the practice of architecture other than that of teaching.

The Curriculum

The curricula, as they usually appear in the school catalogues, are very little more than a group of labels. Courses with the same names at the several schools differ with the personality and training of the faculty. We have already said that our problem in education does not deal with labels, but with the subject matter and how it is presented. As this depends upon the faculty, so will the curriculum depend upon the faculty. Therefore, instead of offering a curriculum completely worked out, I am offering the following courses:

In the architectural school:

- History of civilization
- Architectural problems
- Architectural seminar
- Optional lectures for other departments

In other departments of the university:

History (Study of special phases)	
Literature	Sociology
English	Psychology
Foreign languages	Geology
Music	Mathematics
Philosophy	Chemistry
Business Law	Physics
Economics	Speech

This is only a tentative layout of the courses.

The extent to which the architectural student will be required to study the courses offered in the architectural school, and what courses and the extent of study required of those courses in the other departments of the university will be left to the faculty of the school of architecture. This is not a school for the mass or the average architectural student, but a school for the individual. As no two individuals are exactly alike it will be necessary in some respects to vary the course followed by each student. For this reason it is desirable to leave the requirements of the course to be worked out by the faculty in conjunction with the individual student.

A certain standard of accomplishment--agreed upon by the faculty--in all the courses in the architectural school will be required of all students. Architectural problems and architectural seminar will be arranged into a progressive series of exercises, and conferences, which will require from the regular student such time as to cover five afternoons a week and Saturday morning for a period of six scholastic years. All the students will be required for the

first four years to take the same progressive series of exercises, etc., covering the study of architecture in a general way with no special emphasis in detail, on the different phases of architecture. In the last two years the student may continue this general study, going into detail in the several phases in a minor way, or he may specialize in one or more of the different phases of architecture. The mornings of five days a week throughout all of the six years will be left for the regular students to pursue their studies in other departments, and to take the required course of history of civilization.

It is also to be noted that the faculty with the exception of the professor of history will have these mornings to study the problems of educating the individual student; to keep informed on the latest developments in their special fields in both teaching and practice; for conferences to plan problems for the students, to discuss methods of teaching, and to exchange ideas on their special phases of architecture; and to give lectures in the optional courses offered to the other students of the university. The exact time and amount of these optional courses will be left for the faculty of the architectural school to

work out with the governing body of the university.

The student with advanced standing who has had a part or all of the work that is deemed necessary for him to have in the courses offered in other departments, may devote more of his time than the regular five afternoons and Saturday morning to the architectural courses. And thus, he may finish the work in less time than the usual six years. Occasionally an exceptional regular student may also be able to finish the work in less than six years. Regulations governing the irregular student, the student without all of his secondary training, the student with advanced standing in either architectural training or the liberal courses, or the student who has several years of practical experience, will be left for the faculty to determine.

Methods of Teaching

The course in history of civilization will be worked out by the professor of history with the faculty of the other history departments of the university. This group of the university faculty will collaborate in giving instruction in history of literature,

mankind, art, and architecture. The manner in which this study of the history of civilization is to be conducted, that is, the extent to which the course is to be presented by lectures, slides, photographs, moving pictures, research reading, or sketches, etc., and the length of the course will be left for this faculty group, with the professor of architectural history in charge, to choose. The professor of architectural history shall not present his phase of the course as a vocabulary of architectural form. He shall relate it to the social, economic, and structural factors that were back of the architectural forms. Every endeavor shall be made to stimulate the student's interest in architecture and the other arts, and their relation to life in general, so that he will enlarge his knowledge of them by further study; and to assist the student in cultivating a more refined taste.

In the progressive series of exercises arranged by the faculty for the course in architectural problems will be included all the work that is covered by our present day schools in drawing, graphics, construction,

and design, as was given on Pages 58, 59, 62 and 68 respectively. You may call this course in architectural problems "design" if you like, but it must be kept in mind that it involves much more than our present day courses in architectural design. I have listed on my faculty no special professor of "design" because there will not be one man in charge of this group and one in charge of that, nor will there be any attempt to separate this work into rigid classes of "design", "construction", etc.

The faculty members proficient in space relations, architectural materials, means of expression, structural engineering, mechanical equipment of buildings, and professional practice will collaborate, with the professor of space relations in charge, in presenting this course in architectural problems. In a broad meaning of the word "design", all of these men are professors of design.

The beginners in the architectural course will start with problems in making three dimensional abstract designs of buildings. The objective will be to get the student to visualize the building in its

totality. These first problems will be confined to buildings in the vicinity of the university. From the very beginning stress will be placed upon "purpose", that is the nature of the function that the building is to perform. It must be impressed upon the student's mind that there will be economic and social considerations to be met. To meet these considerations the student will realize that he must do some studying in the departments of economics and sociology. This arousing of the student's mind with these considerations, and with "purpose" is to get him to think of some of the forces that affect architecture.

With the consideration of "purpose" in solving his first problems in abstract design the student realizes that he has space to be inclosed in his building. This leads him to a study of volume. But this study in the abstract soon becomes insufficient for his ever inquiring mind. He wants to know how this space is inclosed, and imaginary planes are not satisfying. He has a need for architectural materials to enclose the volumes that he has been studying. These materials lead to more complicated thoughts.

The physical forces of the world come into play. Materials involve weight and the student finds himself face to face with problems of mass, and structural problems. But these are not all the problems caused by the physical forces. There is weather to keep out; that calls for impervious materials. There is the temperature to adjust; that calls for heating, ventilating, or air conditioning of the space enclosed. After enclosing the space with materials, it may be dark inside which in turn may call for windows and artificial lighting. There must be doors so as to get into the enclosed space. The doors and windows bring up the problems of details. And, this might continue on almost indefinitely, but it is only a resume of a part of the problems to be met in the study of architecture.

The faculty will work out a progressive series of programs which involve all these problems from the first studies in volume of a simple building to thorough studies of the more complicated problems of not only single buildings, but groups of buildings and city planning, such as the architect

meets in every day life. Each problem will have certain objectives to be attained, but the student will always be free to carry his study of the problem beyond these objectives. As the student progresses, one of the objectives will be for him to write his own program. A well thought out preliminary study made with access to library, files and other information will be required on each new problem. Lettering, graphics, drafting, modeling, composition, perspective, freehand sketching, and rendering will all be learned as the student goes along.

As mentioned above, the first problems will be of buildings in the vicinity of the school, but as the student progresses this restriction will be abandoned. However, the problems will always be confined to monuments and buildings that are suitable to the life of the day,--contemporary life. In the solution of the problems the economic and social factors of contemporary life will be kept in mind. Considerations of materials, structural engineering, mechanical equipment, and professional practice will all be worked into the problems by degrees, and in

their proper relation as the student progresses.

As mentioned on Pages 124 and 125, all students will take the same series of architectural problems for the first four years. During the last two years they may follow any one or more of the different phases they choose. Many of the problems given during these last two years will be collaborative problems in which each student in the several phases works out, with the others, that part of the problem which belongs to his specialty. During these two years problems will also be given in collaboration with other departments such as the department of landscape architecture, allied arts, or civil engineering. Also during these two years the student will associate with the faculty in carrying on a limited amount of private practice.

The course in architectural seminar will consist of conferences between one or more of the faculty and one or more of the students. The nature and the number of these conferences will be determined by the faculty and students. The specific purposes of this seminar course are to bring the student and the

faculty closer together, to get away from pedantic training, and to bring about not only an interchange of ideas from teacher to student, but from student to student and from student to teacher.

The optional lectures for other departments are for the express purpose of furthering the public's appreciation of architecture. This course may consist of lectures on history of architecture, planning the home, financing a building project, request lectures, and such other lectures which the faculty may decide to give.

All the work in the architectural school will be on a noncompetitive basis. The only grades given will be satisfactory or unsatisfactory. The faculty will endeavor to keep certain groups working on the same problem at one time so that there may be an interchange of ideas among the students. However, when any one student has satisfactorily completed his problem he will be free to go on to the next problem.

In working out the student's course of liberal studies to be taken in other departments of the

university, the student will be encouraged by the faculty of the architectural school to attend as many of the lectures on the suggested courses (as given on Page 123) or other courses that are not listed as he desires. It will be impressed upon the student that the architect has need for a broad liberal training. The student will find that in his architectural problems there will be many instances where it will be necessary for him to study the subject matter offered in some of these courses.

When the student has found out with the guidance of the architectural faculty, the courses in which he is especially interested and the ones for which he has the most need, he may, if he desires, confine his liberal studies to these courses. Before continuing his liberal studies into the advanced work in these courses, it will be necessary for him to pass satisfactorily a general examination on the elementary work. Otherwise no examinations and no grades will be given until the student is ready to apply for graduation. At this time the student will take general examinations over all his liberal studies.

Whenever possible during the summers or while out of school, the student will be expected to find work in an architect's office, with a material firm, or on a construction job.

When the student has attained a certain standard of accomplishment in the required exercises and problems, and has satisfactorily passed comprehensive examinations over the lectures and conferences in the architectural school and in the courses of the other departments, he will be graduated with a Diploma in Architecture.

Graduates in architecture who have had at least one or more years in practice may be enrolled in graduate study at the school to work for the degree of Master of Architecture. The amount of this work will be determined by the faculty. In character it shall be of a more advanced nature than the undergraduate work, and may be general or along specialized lines.

The doors of the architectural school shall always be open to the practicing architect who wishes to do research work.

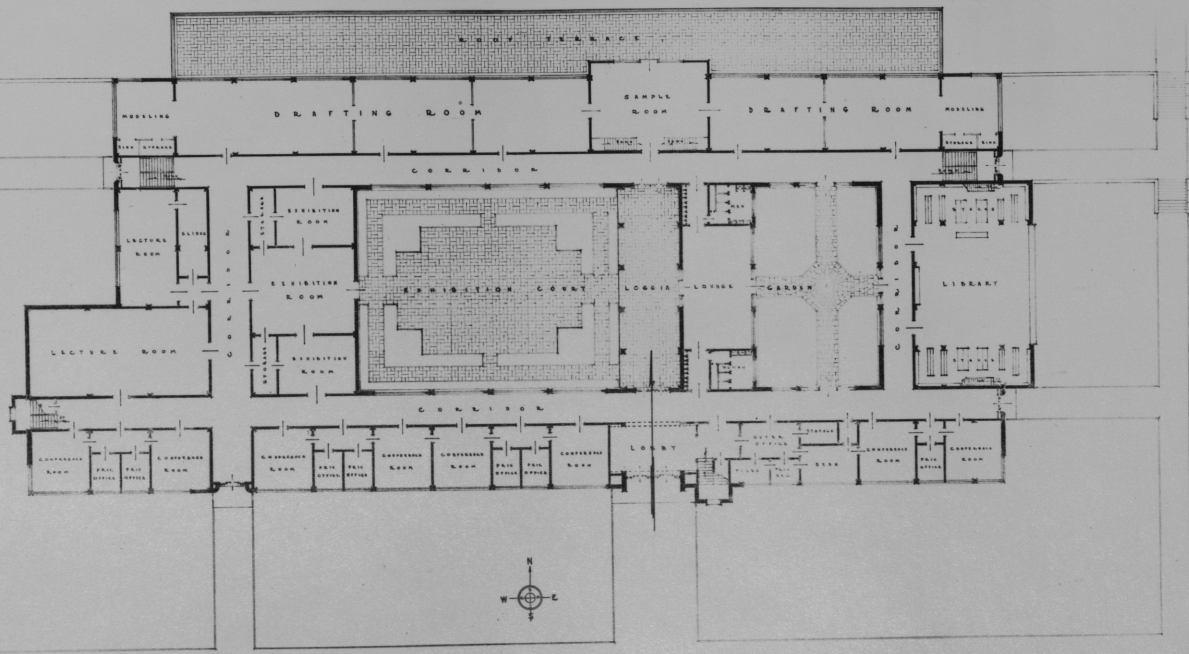
Equipment

The equipment that will be necessary in order to carry on the work of this proposed school will consist of a library of books and bound architectural magazines; files for magazine plates and student problems; modeling materials, models, and model cases, samples of materials; lanterns and slides; a moving picture projecting machine; drafting boards and tables; office desks and study tables; and miscellaneous equipment. Provision of space for this equipment will be shown on the plans of the building of the school for contemporary architectural training that are to follow.

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A DESIGN FOR THE SCHOOL
FOR
CONTEMPORARY ARCHITECTURAL TRAINING

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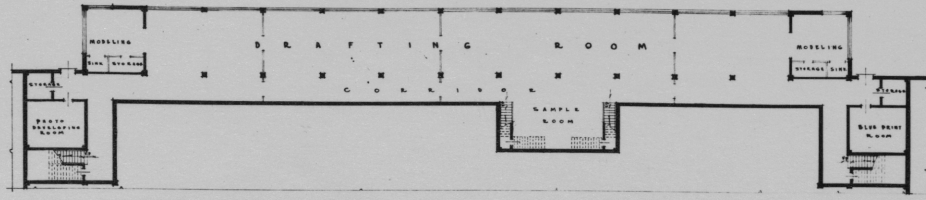
FIRST FLOOR PLAN

DESIGN FOR THE SCHOOL OF ARCHITECTURE

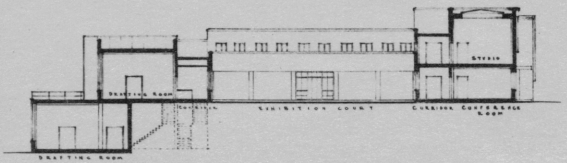
Thomas Carrick '32

First Floor Plan

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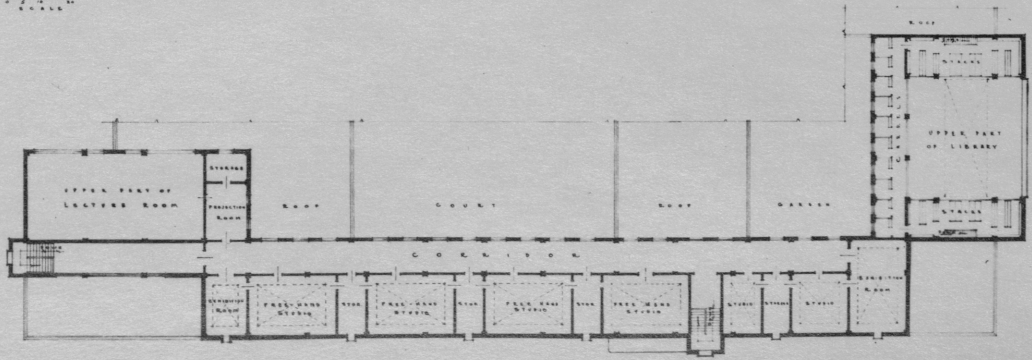


GROUND FLOOR PLAN
NORTH ELEVATION



SECTION
SCALE

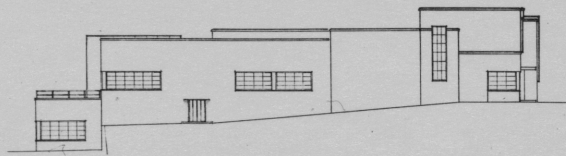
DESIGN FOR THE SCHOOL
OF ARCHITECTURE



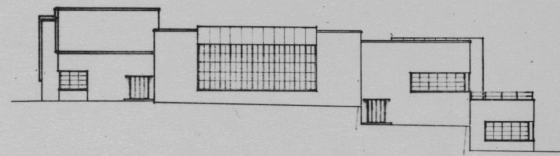
SECOND FLOOR PLAN

Second Floor Plan,
Section, and Ground Floor Plan

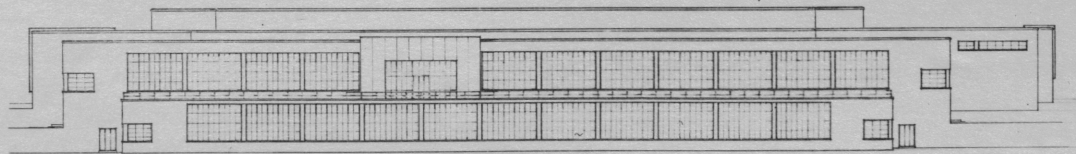
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WEST ELEVATION



EAST ELEVATION

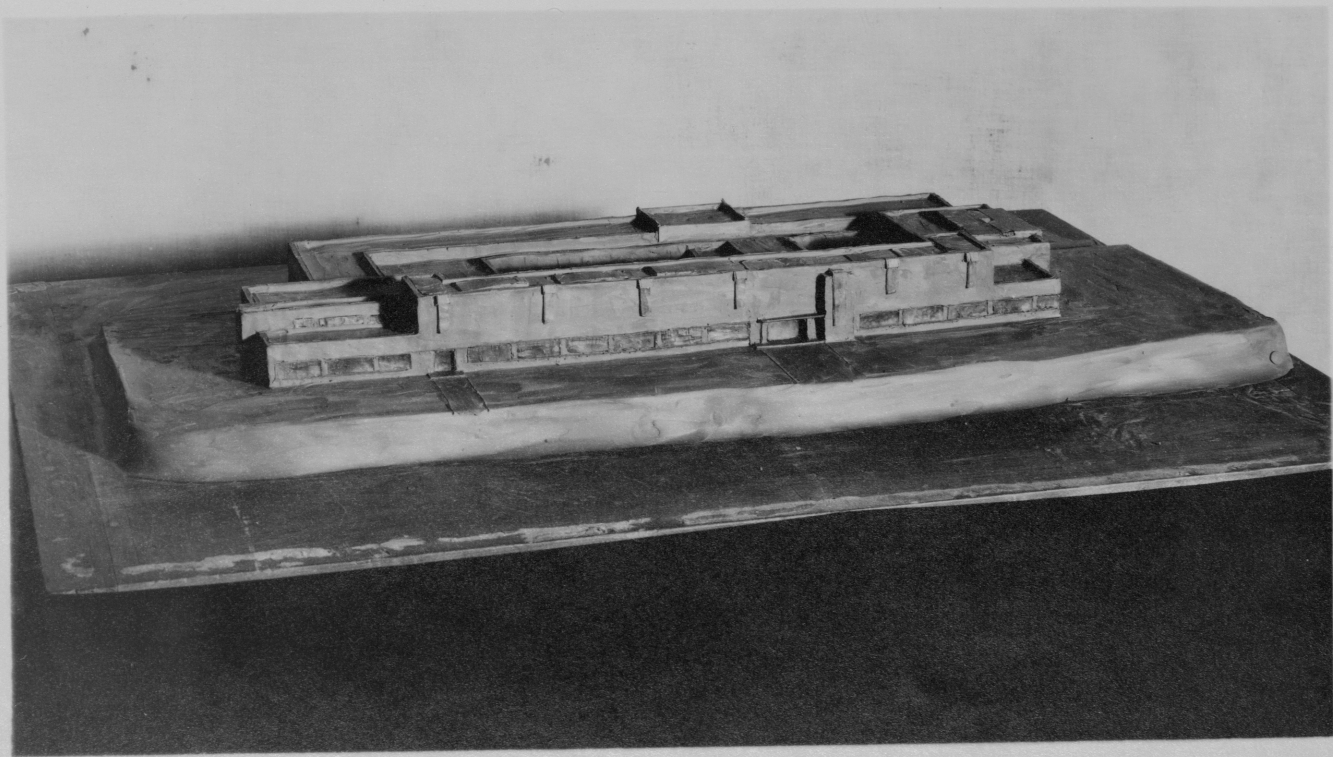


NORTH ELEVATION

DESIGN FOR THE SCHOOL OF ARCHITECTURE

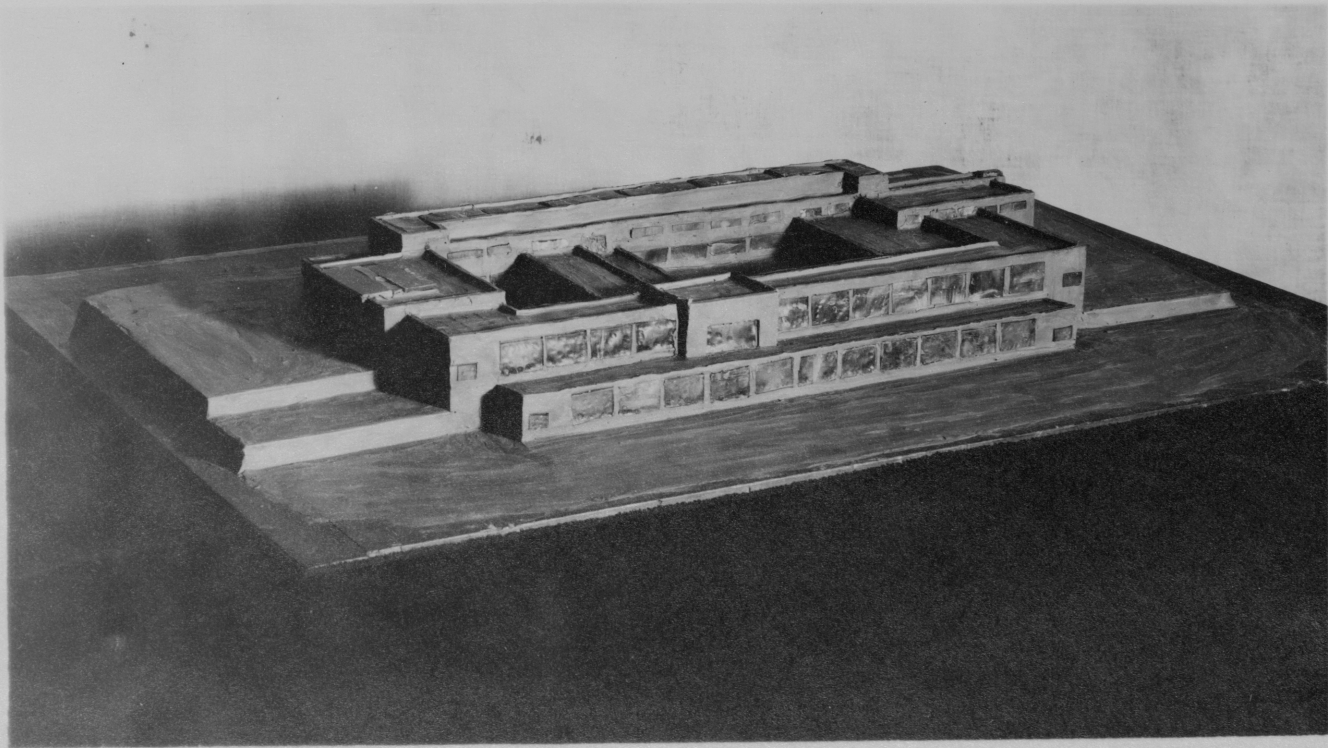
West, East, and North Elevations

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Airplane View from the Southwest
of the Study Model

!!!



Airplane View from the Northeast
of the Study Model

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CONCLUSIONS

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In conclusion I wish to state what I consider the outstanding advantages of the school of architecture that I have proposed:

1. Entrance requirements based entirely on a personal selection basis.
2. Limited enrollment.
3. A full time faculty who are primarily educators, but who, in addition to having had a general architectural training, have specialized in their particular phase of architecture in either school or practice, or in both.
4. Architecture presented as one combined course on a noncompetitive basis, with the members of the faculty cooperating by presenting their particular phases in correlation with the whole.
5. Grades given only as satisfactory or unsatisfactory.
6. A school for the individual student, and not for the mass or the average student.

7. The large amount of time allowed for liberal studies, the freedom with which the student may choose his own liberal studies, and the opportunity to carry on his liberal studies in conjunction with his technical studies.

8. The opportunity for the advanced student to specialize in any particular phase of architecture or to generalize in architecture as he may choose.

9. The opportunity for collaborative problems among the students in the school of architecture, and between the students of the school of architecture and those of other departments.

10. The association of the faculty and the advanced students in carrying on a limited private practice as an educational policy.

11. The opportunity to break down that imaginary boundary line that exists in architectural training between the theoretical and the practical.

12. The student will not be taught what to think or how to think, but to think in terms of architecture and its relation to life in general.

13. The student will be taught that an architec-

tural solution is arrived at by an integral process of developing an expression, in form, of the "purpose", and not merely by an arrangement of form.

14. Requirements for graduation based upon the attainment of a certain standard of accomplishment in required architectural problems and a comprehensive examination of both the technical and liberal studies taken by the student, and not upon a set number of academic hours bearing this or that label.

15. A school housed in a building designed for that particular school.

* * *

With apologies to Vitruvius--I request of those who may read this thesis, that if anything is set forth with too little regard for grammatical rule or personal feelings, it may be pardoned. For it is not as an eloquent rhetorician, nor as a very great philosopher, nor as a diplomat, that I have written this work, but as an architect who has had only a dip into these studies.

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Applied Fine Arts at the University of Cincinnati

Vol. 125 (1924)

By Herman Schneider

The Schools and Modern Architecture

Vol. 141 (1932)

By George Young, Jr.

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In the Interest of Architectural Design
Vol. 48 (1928)
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Cooperative Education
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Miscellaneous

Passing Through Germany
1927 Edition

Proceedings of the Sixty-third Annual Convention
of the American Institute of Architects (1930)

Proceedings of the Sixty-fourth Annual Convention
of the American Institute of Architects (1931)

Minutes of the 13th to 18th) Annual Meetings
of the Associations of the Collegiate Schools
of Architecture (1926-31)

Lecture: To The Young Man in Architecture
By Frank Lloyd Wright
At the Chicago Art Institute

Catalogues of the following schools:
Bauhaus at Dessau, Germany
University of Oregon
University of Michigan
Massachusetts Institute of Technology
Carnegie Institute of Technology
University of Cincinnati
Yale University
Columbia University
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Harvard University
Cornell University
University of Southern California

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