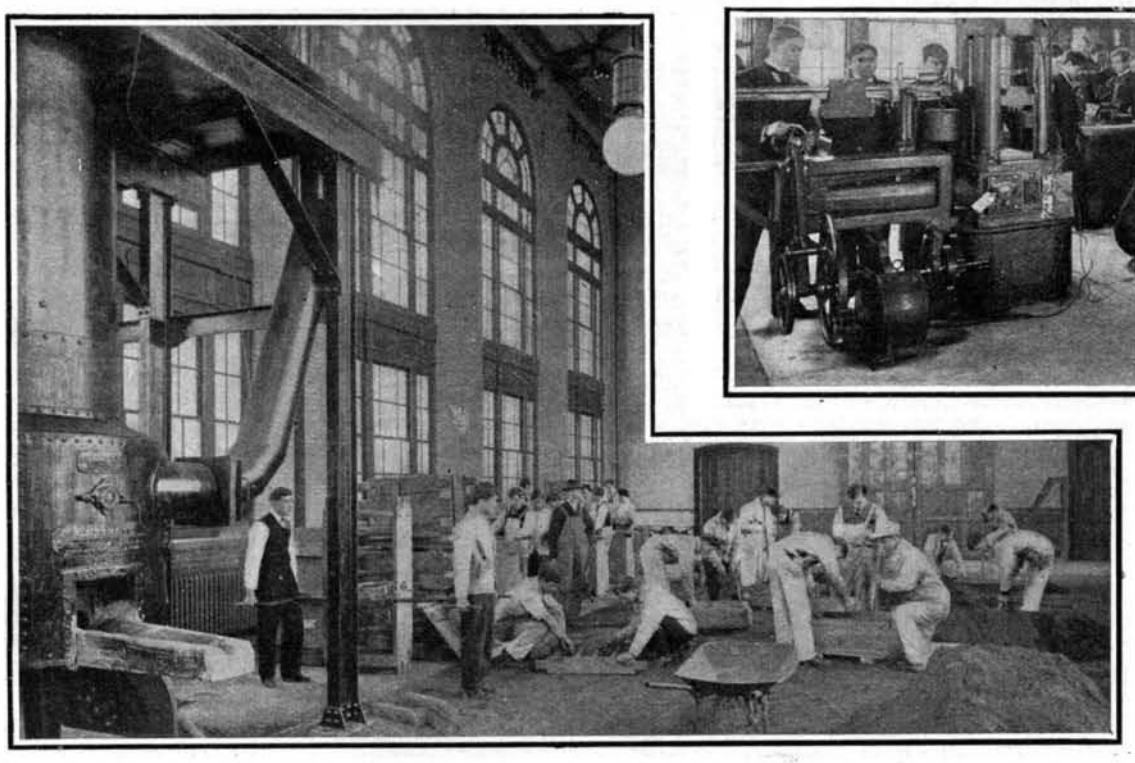
THE CARNEGIE TECHNICAL SCHOOLS, PITTSBURG, PA.

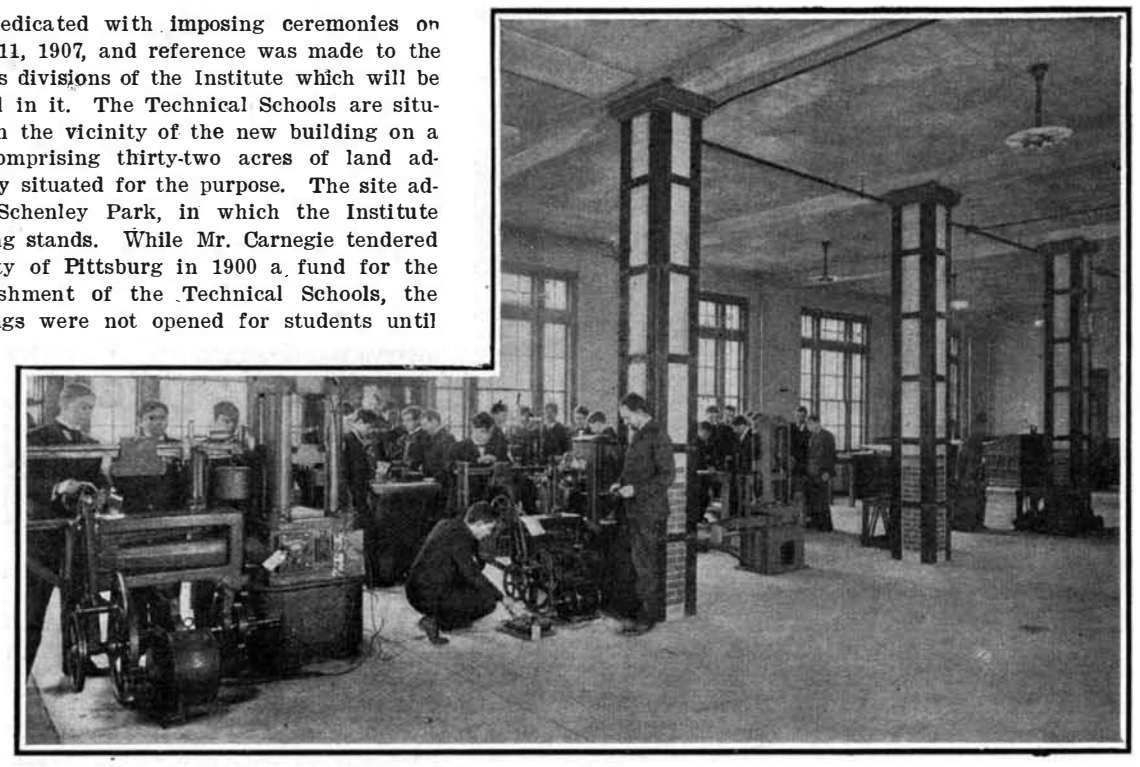
BY DAY ALLEN WILLEY.

The dedication of the new building intended for the library, art gallery, museum, and music hall of the Carnegie Institute at Pittsburg, calls attention to the group of Technical Schools, which is also a division of the Institute. While none of these is included in the new building, the magnitude of their scope, and the large membership of students who receive instruction in the various branches they comprise, make them one of the most important activities which are embraced in the Institute. The fund provided for establishing and maintaining the Technical Schools represents a considerable portion of the entire fund given by Mr. Carnegie to the city of Pittsburg—the amount aggregating nearly $20,000,000.

In a recent issue of the SCIENTIFIC AMERICAN a description was given of the splendid structure which was dedicated with imposing ceremonies on April 11, 1907, and reference was made to the various divisions of the Institute which will be located in it. The Technical Schools are situated in the vicinity of the new building on a site comprising thirty-two acres of land admirably situated for the purpose. The site adjoins Schenley Park, in which the Institute building stands. While Mr. Carnegie tendered the city of Pittsburg in 1900 a fund for the establishment of the Technical Schools, the buildings were not opened for students until October, 1905. However, the people of Pittsburg and vicinity have already taken such advantage of the opportunities afforded for technical education, that during the past year the average attendance has been nearly 800.



A Corner of the Foundry.

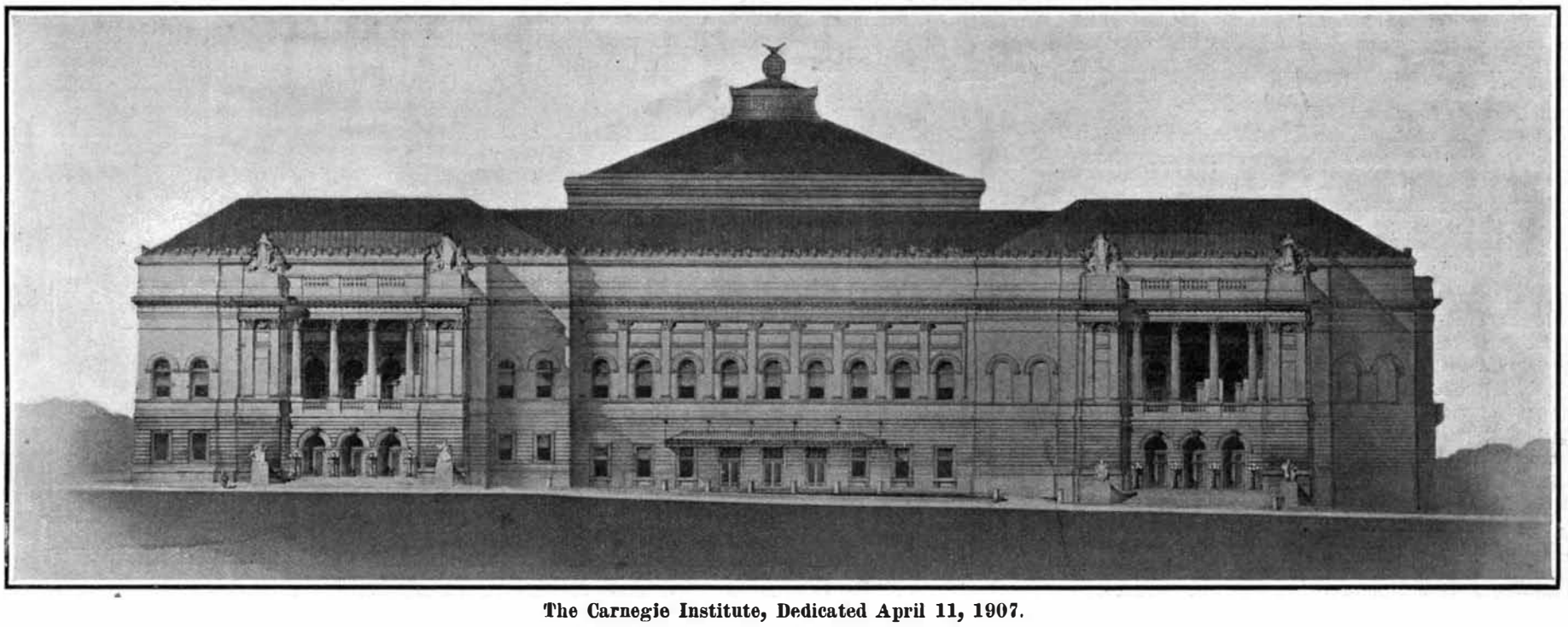


Testing the Strength of Materials.

While the great body of students has come from the city of Pittsburg, the many manufacturing suburbs of the community have contributed a large number, and it is evident that the various schools are reaching just the class of young people for whom they were especially intended. The buildings which have thus far been erected have a frontage of no less than 650 feet on Schenley Park, but the site they occupy has a total frontage of nearly a half mile, so that ample space is afforded for the proposed enlargements, which, when completed, will make this group one of the most extensive of its kind in the world. The architecture of the buildings, which is well shown in the accompanying illustrations, affords abundant light and ventilation, while, it may be added, the construction is practically fireproof.

From the standpoint of attendance, the School of Applied Science heads the group. Here about 500 students take the various courses which it offers. The instruction is given to night as well as day classes,

The Carnegie Technical Schools as They Are To-day.



The Carnegie Institute, Dedicated April 11, 1907.

THE CARNEGIE TECHNICAL SCHOOLS, PITTSBURG, PA.

A Class in Plumbing.

and includes such important subjects as Metallurgy, Industrial Chemistry, Electro-Chemistry, Structural Design, Railroad Construction, Municipal Engineering, Generation and Transmission of Electricity, Testing and Designing of Electrical Apparatus, Machine Design, Design of Prime Movers, Iron and Steel Manufacture, Location and Operation of Mines and Quarries, and Smelting and Refining.

From these topics it is evident that the student who desires to engage in mining, electrical industry, to become a civil engineer or merely a shop machinist, can fit himself for his favored vocation. The routine includes not only recitations and lectures, however, but practical demonstrations of subjects, as well as laboratory work, work in the field, and actual shop practice. It is calculated to complete the course selected in the period of three years for day students. Recognizing the needs of many who are occupied during the day, the Night School of Applied Science has been provided with courses covering five years, the instruction being given in Metallurgy, Industrial Chemistry, Structural Design, Municipal Engineering, Generation and Transmission of Electricity, Machine Design, and Design of Prime Movers.

The importance of art and design in technical education is recognized by what is termed the School of Applied Design. Although as yet but a beginning has been made in this direction, the interest shown indicates that this section of the schools will in time become one of the most important, since it gives the opportunity, both in the night and day sessions, for thorough instruction in such specialties as, for instance, architecture, and offers exceptional facilities to those who are already employed as draftsmen for perfecting themselves. The instruction is modeled after the noted atelier system of Paris, modified to suit American requirements.

The School of Apprentices and Journeymen is divided into courses for each class of artisans, and it may be needless to say, it is closely associated with manufacturing industries of nearly all kinds. The aim of this school is to prepare young men for better and more remunerative service as machinists, pattern makers, blacksmiths, molders, plumbers, electrical wiremen, sheet-metal workers, bricklayers, house and sign painters, etc. The system of instruction has been designed to give the students a broader knowledge of their trades than it is possible for them to acquire by work in shops or on buildings under the prevailing system of minute subdivision of trades, which has succeeded the well-tried European system of apprenticeship, and has deprived the American mechanic of the opportunity to acquire a general training in his calling.

The school does not attempt to develop skilled mechanics, but offers courses of instruction to supplement the usual apprenticeship, to strengthen the reasoning faculties, and to teach both the theory and the practice of the trades to those who are gaining their whole knowledge through practical operations in their daily employment. The system of instruction is adapted primarily to those pursuing mechanical vocations, advancing them along their chosen lines, preparing them to fill higher positions when opportunity arises, and developing their natural talent and skill. Modern conditions make it imperative that the future mechanic be trained in the trade school in the same way and with the same efficiency as the modern engineer is trained in the engineering school, in view of the great growth and development of the country's manufacturing and building industries, which has created an enormous demand for properly-trained mechanics.

The calendar for the present year well illustrates the instruction given in this school. It embraces Machine Work, Pattern Making, Blacksmithing and Forging, Molding and Foundry Work, Plumbing, Bricklaying, Sheet Metal and Cornice Work, Electric Wiring, House and Hardwood Finishing, and Sign Painting. As in the other departments, ample provision is made for practice in the way of shop work, while mechanical drawing and mathematics are essentials.

The school for women is also divided into night and day sessions, and is specially notable for the variety of vocations in which instruction is given by experts. The young woman who enters the Carnegie School for Women has an opportunity to fit herself to become the matron or manager of such institutions as boarding schools, college homes, and children's homes, to become the housekeeeper or steward of a hospital, sanitarium, or hotel, to superintend the filing or recording of accounts and other data in factories and stores, or to become the secretary of the business or professional man or his confidential clerk. It will be recognized that the scope of instruction in this portion of the Institute is unusually broad, but in addition it trains women in dressmaking and designing and other vocations, so that they can become of valuable assistance in such establishments as department stores, dressmaking shops, and in other similar lines of industry. It would be impossible to give all of the details of the branches of instruction which are included in this school, but it may be said that it gives a practical education in as many skilled vocations for women as any institution in the United States, and has already trained a large number.

In planning the technical school, liberal provision was made for laboratory and shop work as well as study, recitation, and lecture. The mechanical students have access to fifty different machines for wood and metal working, all of which are of modern design and driven by individual electric motors, in addition to a number of smaller power tools intended for various purposes. One of the most interesting divisions is the materials laboratory, as it is called, where instruction and practice are given in machine design, prime movers, furnaces, and mill machinery. The laboratory contains nine sets of power-generating apparatus. An individual power plant has been installed for operating the mechanism in the schools, as well as for lighting and heating the building. In itself it forms an interesting object lesson to the student. The engine is one of the latest designs of the Westinghouse horizontal gas engine of the two-cylinder type, which is calculated to develop 470 electric horse-power at a speed of 150 revolutions per minute. The engine is direct connected to a 250-kilowatt three-wire generator, furnishing sufficient electrical current for light and power. The flywheel of the engine is 13½ feet in diameter and weighs 30 tons. For the purpose of economy, a Westinghouse gas engine of the vertical type is employed, developing 125 electrical horse-power. This is utilized when power and light are required but for a portion of the schools; it actuates a 75-kilowatt generator. The schools are heated by hot water from a battery of boilers, the water being forced through the pipes in the various departments also by means of electrical power, a variable-speed motor being employed.

The School of Applied Science.

The Physical Laboratory.

As already intimated, provision has been made for the enlargement of the technical schools. The attendance from year to year is increasing so rapidly that additional space will probably be required in the near future, although the present group of structures are of imposing proportions.

The Technical Schools are in charge of Mr. Arthur A. Hamerschlag, director, and a faculty of sixty-six professors and instructors, the secretary of the schools being Mr. William P. Field.

Announcement was made on April 5th of a gift of $6,000,000 from Mr. Carnegie to the Carnegie Institute, $2,000,000 of which is for the Technical Schools.

A Class in Mechanical Drawing.

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