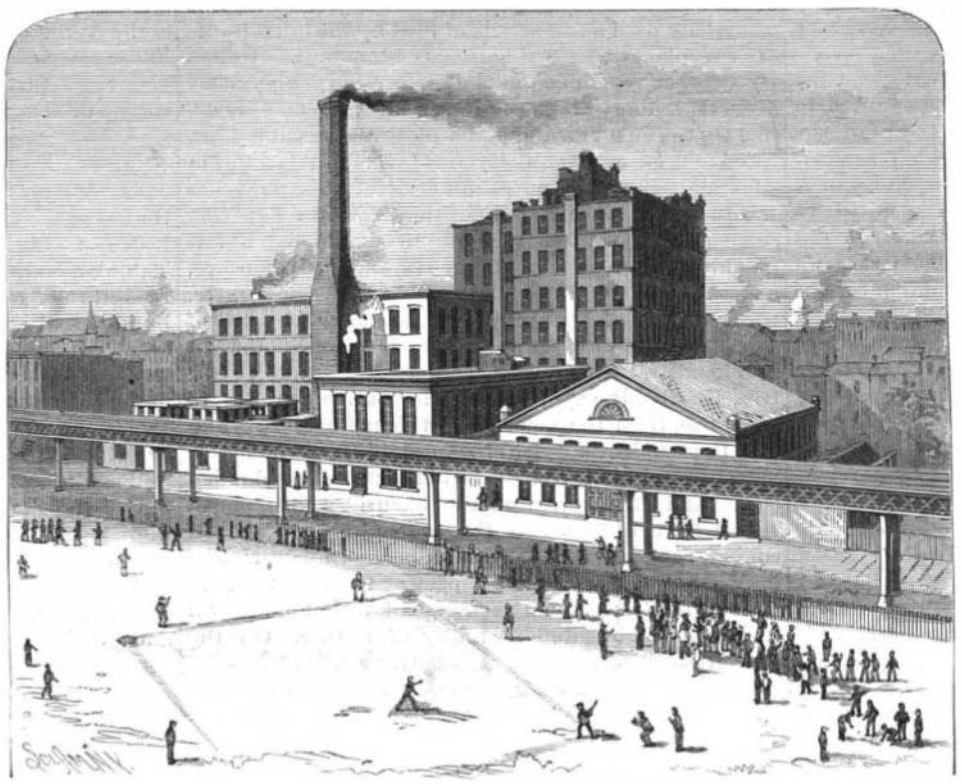
PRATT INSTITUTE, BROOKLYN, N. Y.

In matters of education, as well as in business and all modern enterprises, concentration is the order of the day. Specific courses of study for specific purposes have become an absolute necessity; and while a classical or scientific education is a necessary preliminary to professional occupations, it is no longer possible for a general education to cover the great multitude of known subjects with sufficient completeness to render such an education of any practical value. A great majority of people are dependent upon trades, and these, in many cases, are quickly and imperfectly learned without even a rudimentary education as a basis. In most cases people are obliged to earn a livelihood while learning how to get a living. As a consequence, the time for learning a trade is made as short as possible. It is learned, it may be, from a master who is such only in name, and thus it is that the country possesses many workers who, for a lack of correct training in the beginning, make life a failure.

There are in this country several institutions for technical education which are practical, useful, and highly beneficial to those who avail themselves of their privileges, but there is nothing so good or so perfect that it cannot be improved upon. Of course, it is to be expected that every institution will—so far as practicable—keep up with the times, but an industrial institute starting to-day has the benefit of accumulated experience and of being imbued with the feeling and spirit of the present time. An institute having these advantages has grown in our vicinity to gigantic proportions in such a quiet way that, notwithstanding it is more than a year old and has involved the expenditure of millions of dollars, it is scarcely known beyond its immediate locality. We refer to the Pratt Institute, of Brooklyn, N. Y. The present obscurity of this great enterprise is partly due to the innate modesty of its founder, Mr. Charles Pratt, and partly to his cautious methods.

The philanthropic scheme which culminated in the founding of this remarkable institution was the dream of Mr. Pratt's youth. In early life he was forced to learn what it meant to economize in everything. His education was secured through his own industry and perseverance. He learned the machinist's trade, and by hard work earned enough money to carry him through school. While in school he practiced the severest economy, boarding himself at the cost of a dollar a week. He kept his wants small and in every way husbanded his resources, so as to complete his education without taking upon himself the burden of debt. In these days of close calculation and denial he thought of others in conditions similar to his own, and conceived the idea of working out a scheme of some kind for the amelioration of the condition of other youth and of the world's workers generally. The idea assumed different forms at successive stages of his career, until at length it developed into a scheme for the founding of a great institute for technical education and manual training. This institute is no longer a faint conception or well-defined scheme, but is a substantial reality, a monument to the philanthropy and wisdom of its founder, an ornament to the city in which it is located, and a credit to the country at large. It is undoubtedly the most important enterprise of the kind in this country, if not in the world.

The buildings of the Pratt Institute in Brooklyn contain from three to four acres of floor space, and vary in height from one to six stories. They are located on a plot of land situated between Ryerson Street and Grand Avenue and between De Kalb and Willoughby Avenues, the main building fronting on Ryerson Street, and the buildings for the department of mechanic arts fronting on Grand Avenue. Across Ryerson Street, opposite the main building, is a plot of ground, 350 × 200 feet, extending through the block to St. James' Place, the plot serving at present as a playground for the young ladies connected with the Institute. Across Grand Avenue, opposite the department of mechanic arts, is a plot 250×200 feet which serves as a playground for the boys.



THE PRATT INSTITUTE, BROOKLYN, N. Y.—VIEW FROM THE REAR PLAYGROUNDS.

THE PRATT INSTITUTE—THE FREE READING ROOM.

The main building of the Institute is a brick and terra cotta structure six stories high, 100 feet wide, 50 feet in depth, with an L 37×50 feet upon one side. In the rear of the Institute proper is the department of mechanic arts, covering an area 247×95 feet, these buildings varying from one to three stories in height.

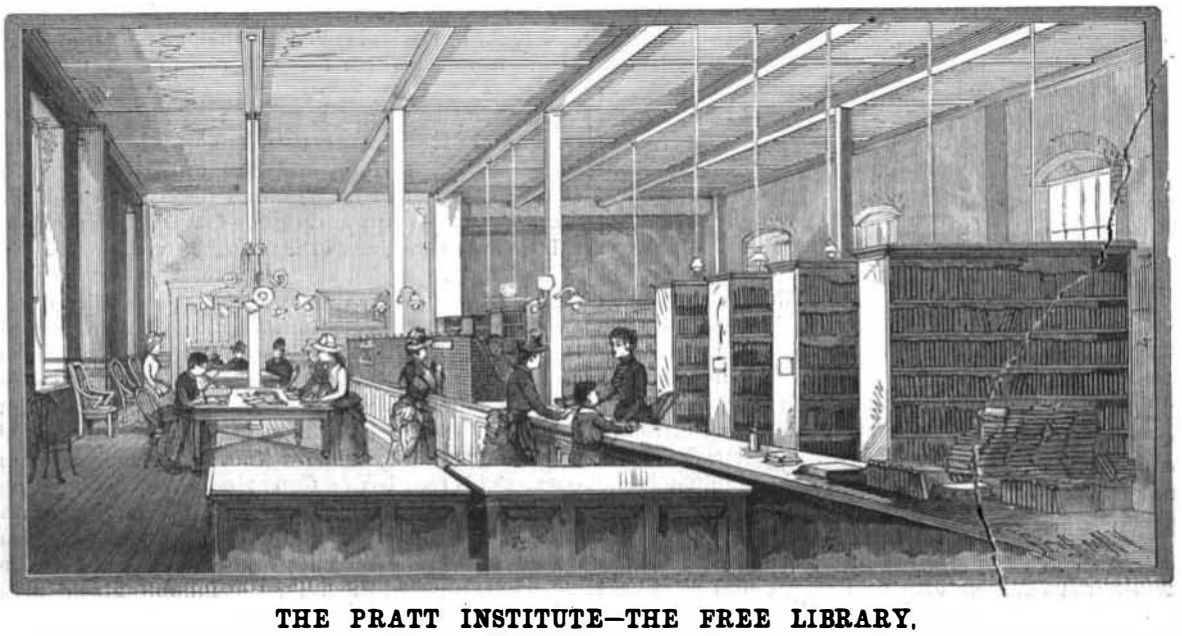
A front view of the Institute buildings is presented in the upper central picture of our large engraving, and the rear, or Grand Avenue side, is shown in one of the smaller engravings. The buildings are provided with all the modern appliances for lighting, heating, ventilation, the prevention of fire, etc. In the main building is a large elevator running from the basement to the tower above, adapted for both passenger and freight service. The buildings are lighted throughout by a complete system of incandescent and arc lamps, rendering evening work in the various classrooms and shops as practicable as that of the day. The buildings—as will be seen by reference to the engravings—are not wanting in external beauty, while they are constructed in the most substantial manner, being practically fireproof, and as strong as would be required for the heaviest kind of manufacturing.

Land for the buildings was purchased in 1884. Contracts were made in the early part of 1885; the work of excavating began about July 1 of that year, and the construction was continued through 1886–87. May 19, 1887, the charter was granted, with power to confer degrees.

In addition to the facilities for technical education, which are designed exclusively for scholars, there are three features of interest to the general public: a free library containing several thousand choice books, to which additions are constantly being made; a free reading room provided with about 150 of the best American and foreign periodicals, and furnished with a library of reference books, such as encyclopedias, dictionaries, and other books often needed for consultation; and a technical museum containing specimens of manufactured articles, together with the crude materials from which they were made, the specimens being arranged to show the various processes through which the materials pass from their original state to the finished product.

The Institute will accommodate several thousand students, who will be charged for the privileges of the institution, but the amount is very low, and all the revenues are to be devoted to the support of the Institute. In addition to this source of revenue, Mr. Pratt has built in Greenpoint, L. I., an apartment building known as the "Astral," the rental of which goes to the support of the Institute. This building cost about $400,000. It is one of the most complete and perfectly arranged apartment houses ever constructed. We doubt the existence of its equal. It is a little city of itself, with every modern appliance for the comfort of its inmates. Still, the rentals are easily within the means of mechanics and laboring men. These apartments, we are informed, are to be deeded to the Pratt Institute.

Part of the basement of the main building of the Institute will be utilized for a lunch room. Upon the first floor of the main building are the library and reading room. A portion of the second floor is set apart for the general offices of the Institute, the remainder being arranged as a lecture hall, in which lec-



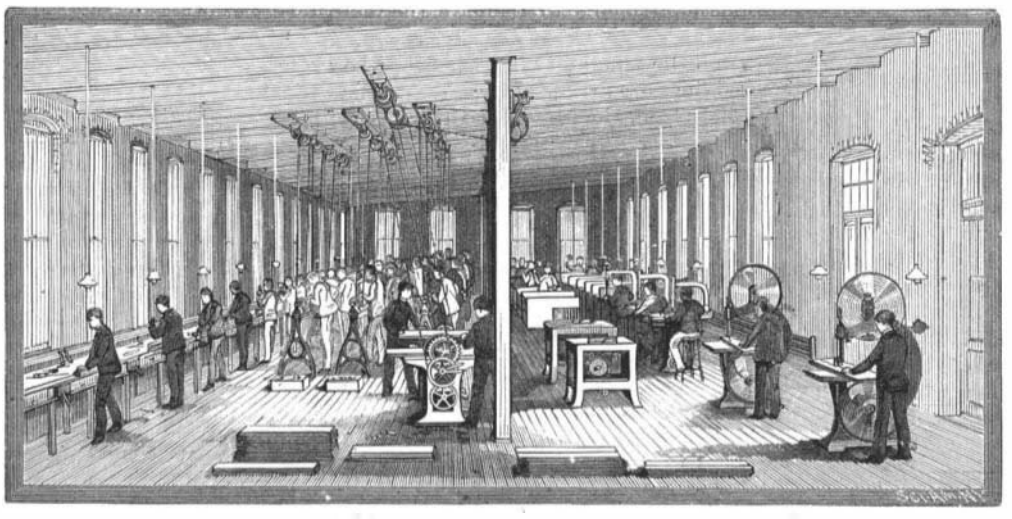
THE PRATT INSTITUTE—THE FREE LIBRARY.

tures upon various subjects are to be delivered from time to time. It is intended that these lectures shall bear directly upon the work of the Institute in all its phases, and shall thus include practical instruction upon those matters which pertain to right modes of living, the problems of political and social life, domestic economy, sanitary science, literary culture, ethics, etc. While many of these lectures may be given as a part of the regular work of the Institute to pupils only, yet many others will be so arranged as to meet the wants of those not directly connected with the Institute, but who wish an opportunity of obtaining systematic instruction upon subjects of interest and importance. The third floor is devoted to sewing, dressmaking, millinery, and art embroidery. In the sewing department instruction is given in all kinds of hand sewing, in machine sewing, and in cutting and making plain garments from patterns. In the dressmaking department a systematic course in dressmaking is given. Each pupil, under the guidance of a competent teacher, learns to fit from measure, make and drape an entire dress for herself or others. In the department of millinery each pupil makes during the course an entire hat or bonnet, combining good taste and good workmanship. The department of art embroidery is intended to train women in designing, due attention being paid to harmony of colors and symmetry of forms.

THE PRATT INSTITUTE—THE MUSEUM.

One of the helpful departments of the institution is the school of shorthand and typewriting, located on the third floor. The work done in this department is thorough and practical.

The entire fourth floor of the main building and the art hall of the sixth floor are occupied by the school of art and design. A great deal of attention has been given to the arrangement of the various rooms of this department, and to the selection of examples for drawing, casts and photographs in large numbers having been purchased in Europe for the use of the students. Every facility is provided for thorough and systematic work, and pupils may here pursue regular courses in drawing and painting, design, clay modeling, wood carving, architectural and mechanical drawing. In connection with the courses, lectures are given on architecture, historic ornament, perspective, design, theory of color, mythology, and artistic anatomy. As drawing is the basis of all constructive industries, pictorial art, and decorative design, this is one of the most important departments of the institution. Particular attention will be given to instruction in sculpture and wood carving, with special reference to the development of a high class of art work in bronze, copper, and stone. This department will be instituted for the purpose of encouraging ladies desiring to become proficient in these branches of art.



THE PRATT INSTITUTE—THE WOODWORKING SHOP.

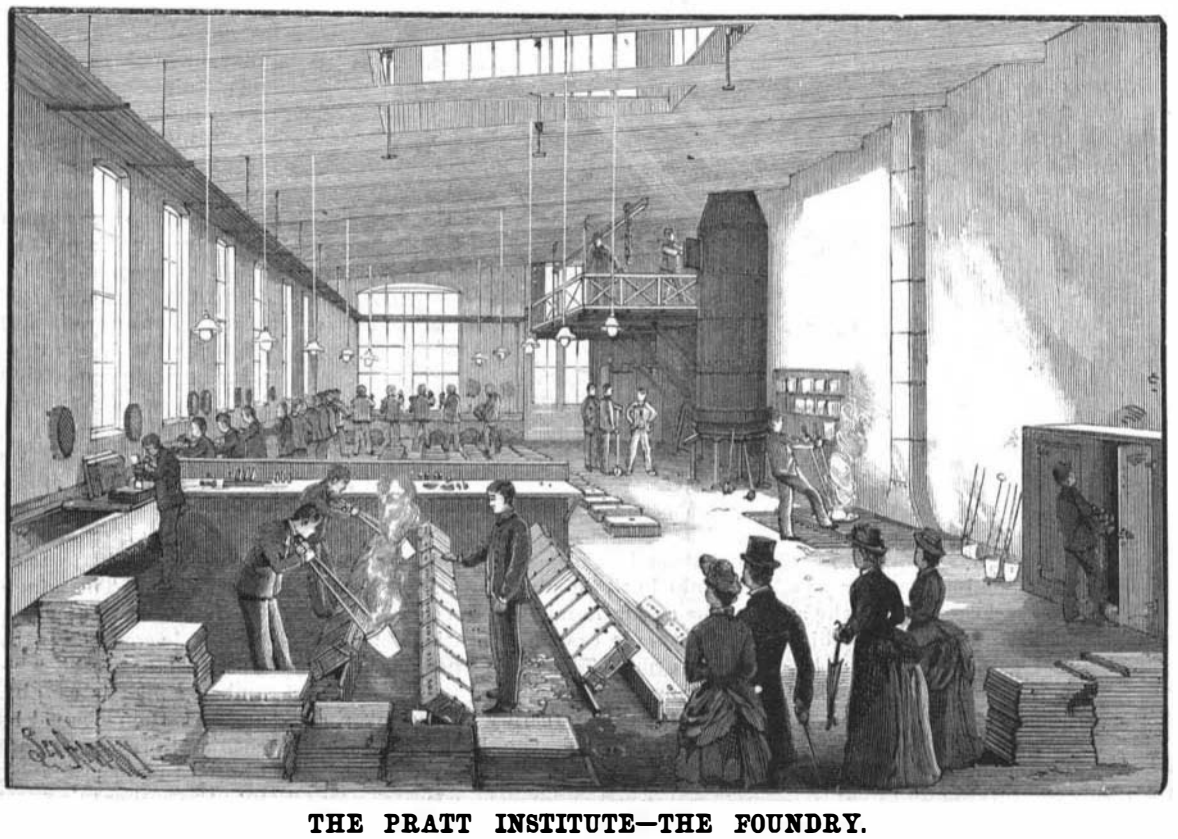
The fifth floor of the main building is set apart for the technical museum. The museum hall proper is provided with rows of substantial oak cases of two classes, vertical and horizontal, all the cases being provided with air tight plate glass doors. In these cases are arranged various wares in different states of completion; some of the finest specimens of glassware, ceramics, bronzes, iron and brass work to be obtained in Europe are shown in these cases. The collection of specimens was begun in Europe in the summer of 1887. At present, the museum contains about 4,000 specimens, being most complete in the department of ceramics. There are specimens of the raw material used in the manufacture of earthenware, faience, porcelain, and various samples from the celebrated manufactories of Berlin, Dresden, Vienna, Sevres, Limoges, Worcester, Derby, and from the Staffordshire potteries of Wedgwood, Minton, Copeland, Doulton, etc. Switzerland, Sweden, Denmark, Russia, and Italy are also represented, the last country by many fine pieces of faience, from Nove, Milan, Bologna, Paroes, Rome, and Naples. In antique pottery there are specimens of Græco-Etruscan and Flemish stoneware, of German and Roman earthenware, and also of pottery from the mounds of the Mississippi Valley, with some pieces of modern clay work by the Indians of Mexico.

Glass is exhibited in various forms, blown, cut, engraved, etched, enameled, and ornamented in many colors, from the works in Austria, Bohemia, Germany, and France, also many pieces of beautiful cameo glass from Messrs. Webb, at Stourbridge, England. Venetian glass also is shown in great variety of modern and mediæval designs, rich in color and unique in form. There are also specimens of Roman, Florentine, and Venetian mosaic work from the laboratory of Dr. A. Salviati.

A set of models from Germany, showing the enamel work of various countries, is represented. Copper, iron, tin, zinc, and other metals, with their alloys, are exhibited in solid, filigree, inlaid, engraved, and repousse work, together with a few choice pieces of Venetian, French, Russian, and American bronze. A large number of ores are exhibited to show the material from which the metals have been derived, and these are placed in close proximity to the artistic and skillfully worked metal. The collection of American materials and manufactures is being rapidly made. It will soon be possible for a visitor to compare the finest specimens of handicraft from both hemispheres.

A part of the collection consists of many species of minerals, and a large number of crystal models in wood and glass, arranged to give an insight into the science of mineralogy. The celebrated diamonds and other gems of the world are represented by handsomely cut facsimiles. A series of rocks, arranged according to Rosenbusch, contains about 600 European specimens, and near these are placed the same number of American specimens. Although the collection is not complete, it shows what may be brought out of the earth by intelligence, labor, and skill.

Upon the sixth floor of the main building is the art hall, provided with a large skylight. It is used for advanced free hand drawing and painting, and for the exhibition of art collections. Upon this floor also are two cooking schools, provided with all the appointments of a well ordered kitchen, including a superb range, gas stoves, galvanized iron sinks, hot and cold water faucets, closets, dressers, refrigerators, etc. Under the skylight, in the central portion of the rooms, are arranged large cooking tables, each furnished with gas burners for cooking and drawers with shelves below. Every drawer and set of shelves is supplied with a complete assortment of cooking utensils, so that twenty people can work at the same time in each room. There are three courses in cooking, of twelve lessons each, advancing regularly from the simplest to the more elaborate dishes. Every pupil is required to give evidence of her thorough acquaintance with the elements of cooking before passing to the higher course. Each pupil is required to work out with her own hands the recipe given her. The instruction comprises lessons on building and taking care of a fire, the proper modes of measuring liquids and solids, of boiling meats, eggs, vegetables, broiling and roasting meats, making soups, puddings, and—most important of all—bread. In connection with every lesson a brief lecture of explanation is given by the teacher on the chemical and nutritive properties of the materials used, the changes produced by cooking, etc.



THE PRATT INSTITUTE—THE FOUNDRY.

(*Continued on page 214.*)

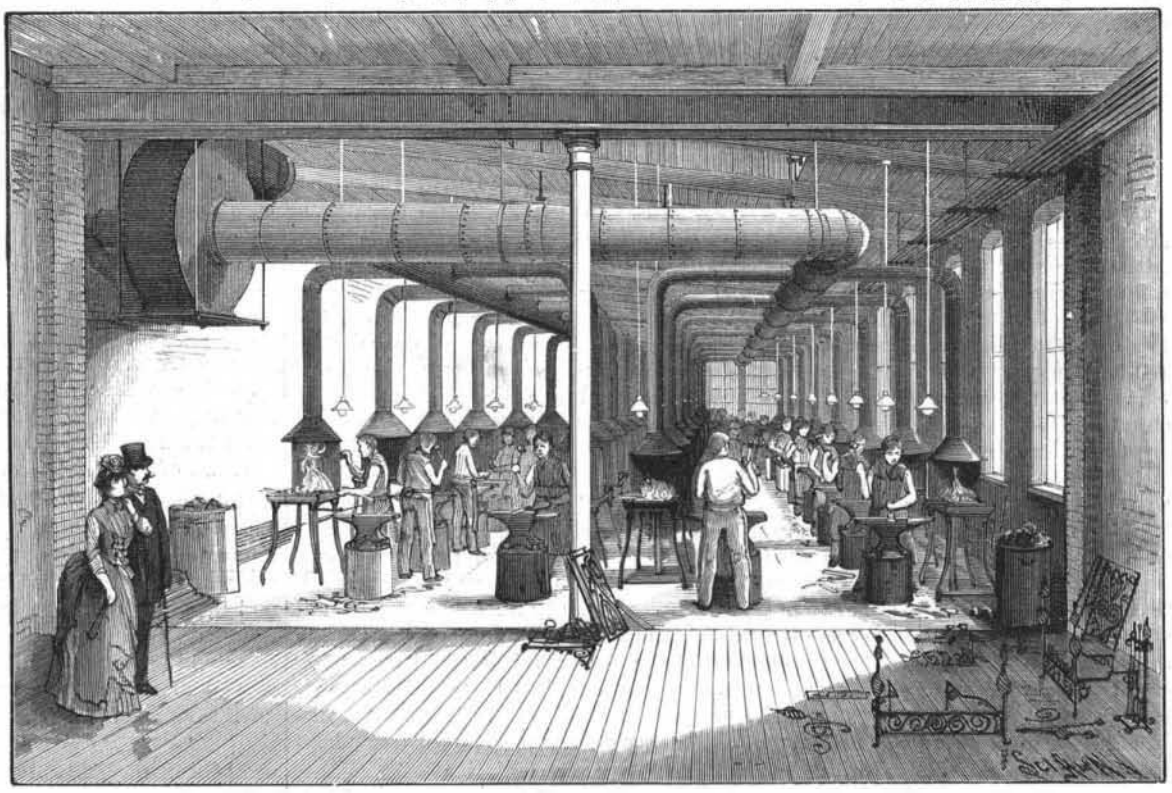
PRATT INSTITUTE, BROOKLYN, N. Y.

(*Continued from page* 211.)

In front of the cooking rooms is a lunch room, where a simple meal well served is furnished at noon and at evening for a small sum. This is intended particularly for the teachers and students connected with the Institute. Communicating with the lunch room is a well equipped kitchen where the meals will be prepared for the lunch room on this floor and also for the large lunch room soon to be placed in the basement of the main building.

The department of mechanic arts is designed for the instruction of three classes of pupils. First, members of the regular three years' course, who, in connection with their studies, science, mathematics, language, and drawing, will be given courses in wood and iron work, joinery, pattern making, wood turning, moulding, casting, forging, etc. For the girl students in this course, decorative work in wood and metals, cooking, sewing, dressmaking, etc., will be substituted for advanced shop work. Second, pupils from other schools who wish to supplement their studies with manual work. Third, those who are employed during the day, but wish to utilize their evenings in acquiring a thorough knowledge of the methods and processes of the industrial arts.

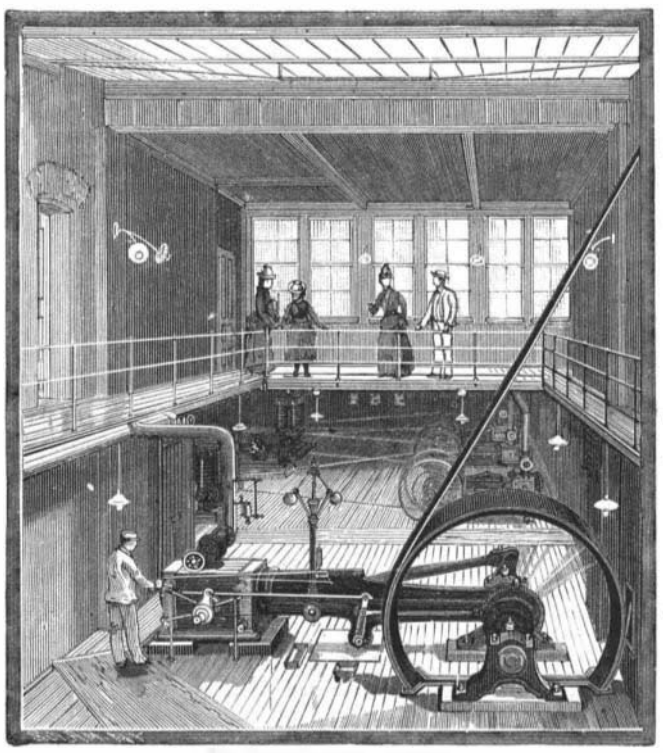
The buildings devoted to this department cover a ground space of 250×100 feet. They are of substantial construction, of brick with bluestone trimmings, and vary in height from one to four stories. A bridge from the third story connects these buildings with the second story of the main building. The basement contains two boilers of 100 horse power each, which furnish steam for heating all the buildings, and supply power for the engines, elevators, electric lights, fire pump, etc. In the engine room adjoining the boiler room is a fine Harris-Corliss engine of 40 horse power for operating the machinery of the institution, and an Armington & Sims high-speed engine, which drives an Edison dynamo for supplying the incandescent lamps in the main building. An 800 light Sawyer-Man dynamo and an arc machine of the Western Electric Co.'s system supply the shops and trade school buildings with light. Both of these machines are driven by a 125 H. P. engine from the N. Y. Safety Steam Power Co. The remainder of the basement of the buildings of this department is used for storage. On the first floor



THE PRATT INSTITUTE. THE SMITH'S SHOP.

is the smith shop, a room 73×29 feet, and 18 feet high, provided with ventilating skylights. The room is furnished with forges and anvils, and is planned to accommodate twenty-five pupils. Pipes laid under the floor carry the blast of the forges, and an exhaust fan takes away the fumes and smoke. In this department the forging of tools and various kinds of iron work, including art forgings, is carried on.

Adjoining the smith shop is the foundry, 66 by 29 feet, with an 18 foot ceiling, provided with two skylights. The foundry equipment includes a 20 inch iron melting cupola, two brass furnaces, a white metal gas furnace, and core oven. Practice is given in green sand, dry sand, and loam moulding, and in core making. Swept-up work is illustrated, and particular attention given to the production of art castings in iron and bronze. Upon the same floor is the machine shop, which is fitted with benches with sufficient room for forty-eight pupils to work at the vise. It is furnished with a full complement of engine lathes, drilling machines, and planers, being, in fact, a fully equipped machine shop.

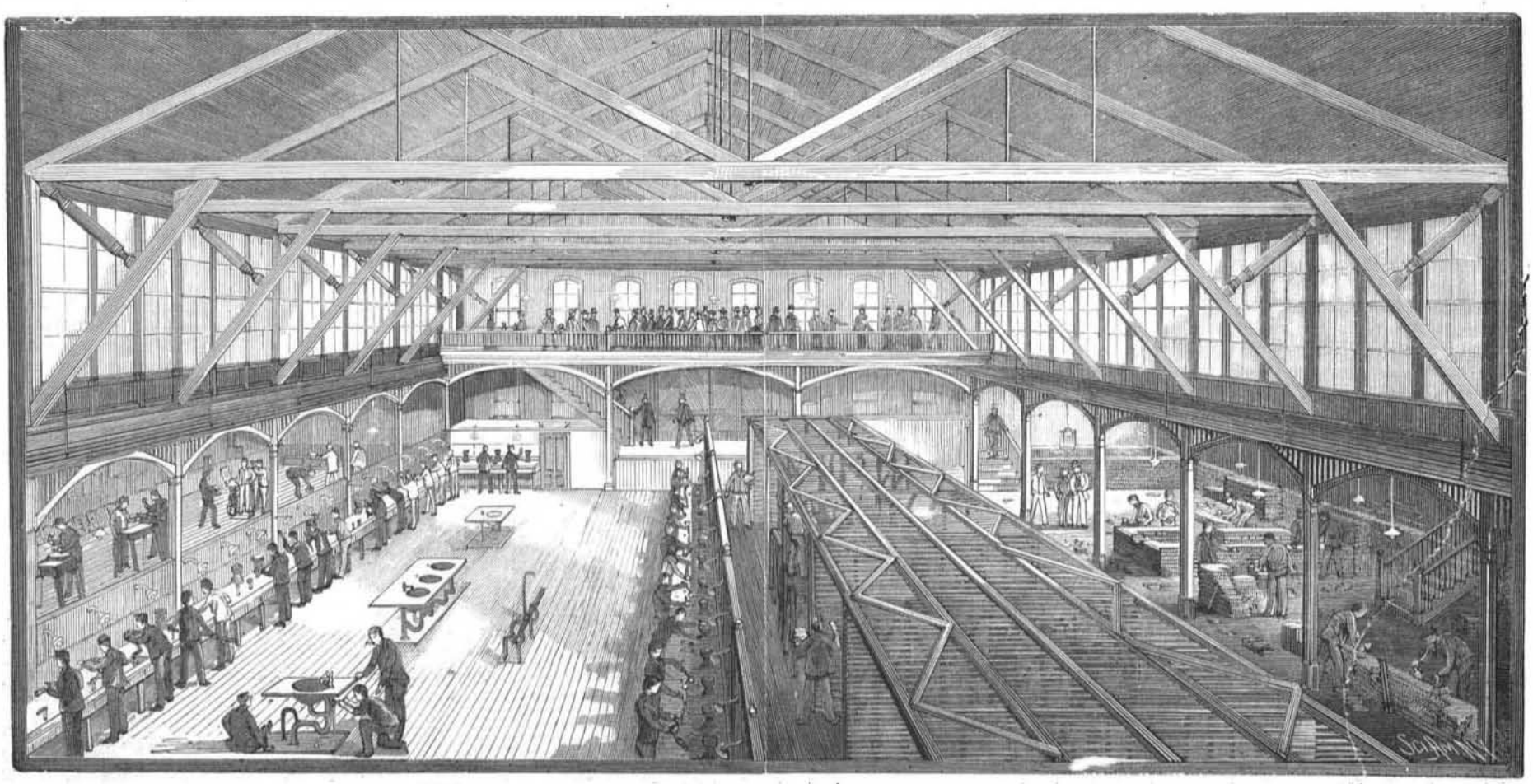


THE ENGINE ROOM.

The wood-working department, which occupies the second floor of the same building, is provided with 150 feet of wall benches and 36 single benches, all supplied with the latest and most approved wood-working tools. The floor also contains a number of wood-turning lathes, a large pattern making lathe, a buzz planer, a surfacer, and circular and scroll saws. Adjoining the wood-working department is a lumber and tool room for the storage of tools and lumber used in the wood-working shop.

The third floor of this building is devoted to laboratories and class rooms, and the fourth to advanced art work in metals, engravings, etc. This last department is not yet organized.

The department of building trades, occupying the remaining buildings of the Institute, is designed for the instruction of pupils in bricklaying, modeling, stone carving, the building of frame buildings, plumbing, etc. In bricklaying, the pupils are first taught to handle the trowel and spread the mortar properly; they are then put to work upon 8 inch walls until they can carry the corners plumb and lay the courses level. Proper care is taken that the joints should be thoroughly struck and pointed. When the student can do this perfectly, he is taught the construction of arches and ornamental brick work. In stone carving the pupils are taught to work out forms illustrating the different styles of orna-

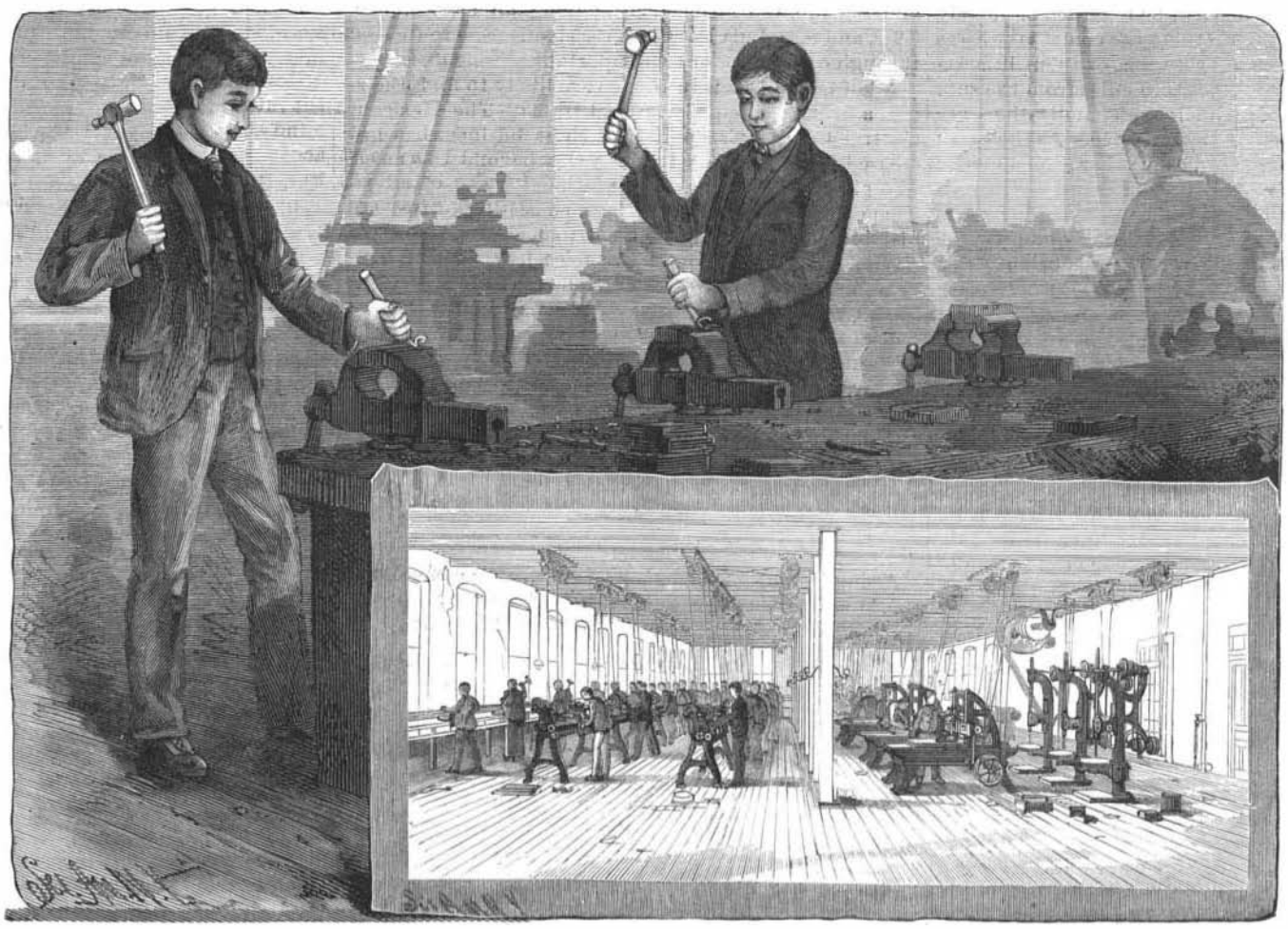


THE PRATT INSTITUTE BROOKLYN N. Y.—THE TRADES SCHOOL.

ment in architecture. All the students are required to sketch their designs and model them in clay before cutting them in stone.

The plumbing section can accommodate 54 pupils, all of the necessary tools and benches being provided for carrying on the work in the most approved manner. The course of study includes the making of lead seams, all kinds of wiped joints, and sand bends. Instruction is also given in the working of sheet metal, in the erection of sewer pipes, etc. The instructions in plumbing amount to a course in sanitary engineering, as the principles of drainage, sewerage, and ventilation are thoroughly considered.

A department of electrical engineering is soon to be inaugurated. This will afford to students of electricity rare opportunity to perfect themselves in this science. Other departments will be added from time to time, as circumstances may require.



THE PRATT INSTITUTE—THE MACHINE SHOP.

Our engravings truthfully represent many of the departments of this great institution, and give an excellent idea of the activity prevailing there. There is no longer an excuse for artists or artisans or students of the fine or mechanic arts for lack of proficiency in their particular departments, for persons without some ability cannot enter this institution, and when once entered they are taken in hand by a corps of competent professors and teachers, who will carry them forward rapidly and thoroughly through the various courses of study, enabling them to graduate with honor to themselves and credit to the institution. In bestowing this great gift upon the public in the prime of his life, Mr. Pratt has enriched the world with something more valuable than gold or silver. He has set an example which might be followed by other wealthy men to the great benefit of the country at large. Such institutions elevate the dignity of labor, raise the tone of society, improve the quality of work, and contribute to the happiness and comfort of wage earners.

Man's War with Creeping Things.

The Philadelphia *Inquirer* asks: What shall be done with the pests? What brings them? How shall they be exterminated? Year by year they seem to increase. More locusts, more grasshoppers, more chinch bugs, more potato bugs, more cut worms, more weevil, more mosquitoes, more flies, more what not? In the struggle to maintain our lordship over all creeping and crawling things we are already having to resort to desperate remedies. In Illinois the farmers of several counties have resolved not to raise any wheat, barley, or rye for three years in order to starve out the chinch bugs. This looks almost like a victory for the chinch bugs, and it becomes an interesting question, moreover, whether such a lockout would exterminate them; whether they could not worry along without wheat, barley, and rye for three years about as well as the farmers by changing their diet to something else. It is evident that man has a great deal to learn yet. He has to learn how to till the earth so that it will yield up more grain and less bugs. The pests would appear to represent a vast amount of misdirected energy. If the inventive mind of man can discover some way to make the life and energy of the pests materialize in the shape of wheat, barley, rye, potatoes, etc., his crops would be immense.

AN ELECTRIC CARRIAGE.

Trial was made recently at the skating rink, St. Paul's Road, Camden Town, of an electric dog cart, built by Messrs. Immisch, of London, for the Sultan of Turkey. In appearance the vehicle does not differ from an ordinary four-wheeled dog cart with the shafts removed, and in this respect the design is perhaps open to criticism, as something might have been done to take off the uncompromising squareness presented by the splash board, and so give the appearance of a carriage specially adapted for the new mode of propulsion. The motor, which is placed in the center of the body of the vehicle, is of Messrs. Immisch & Co.'s 1 horse power type, a current of 20 amperes with an electromotive force of 48 volts being used. Motion is communicated to one of the hind wheels by means of a small pinion on the main shaft of the motor working into a pitch chain, which passes over a series L shaped plates attached at intervals to the inner face of the rim of the wheel, so as to constitute in effect a driving pulley for the pitched chain to act upon. It was stated that the motor could be reversed so as to back the vehicle. The power is stored in twenty-four small accumulators of special type, occupying the space under the seats and said to be sufficient to propel the vehicle at a speed of about ten miles per hour for five hours; but at the trial nothing more than a few runs round the rink was attempted, sufficient to afford the visitors present the opportunity of having a ride, and no great speed could be attained, on account of the confined space and the consequent necessity for frequent sharp turns. The steering is effected by a shaft projecting through the footboard, and furnished with a hand-wheel. On the lower end of the shaft is a pinion which takes into a ring of teeth on the fore carriage. The brake is actuated by a lever, placed in a convenient position for the driver's foot, and the switch for turning on the power is attached to the splash board. The total weight of the vehicle, all complete, is about 11 cwt., the accumulators weighing about 7 cwt. The carriage appeared to run very smoothly, and to be under perfect control, although the operation of backing was not shown during the time of our visit.—*The Engineer.*

AN ELECTRIC CARRIAGE.

Colored Leather.

Modern leather manufacturers, says the *Shoe and Leather Reporter*, are surpassing the ancients in the diversity and beauty of the colors they are introducing. Many of the shades produced in upper leather are highly attractive. The Thebans were thought to have attained great proficiency in this art, but the variety of colors they are credited with was meager compared with the iridescent display of our epoch. Remnants of leather found in Theban tombs reveal the use of acacia and other trees in the tanning process. The Jews, after the exodus, probably put into practice the knowledge obtained of this art under the Pharaohs, in preparing rams' skins dyed red for the service of the Tabernacle.

The love of colors is as old as the human race. The art of dyeing leather, so long practiced on the Mediterranean, was afterward attained with difficulty by other European countries. But we need no longer to go to Egypt or the Mediterranean for instruction concerning it.