

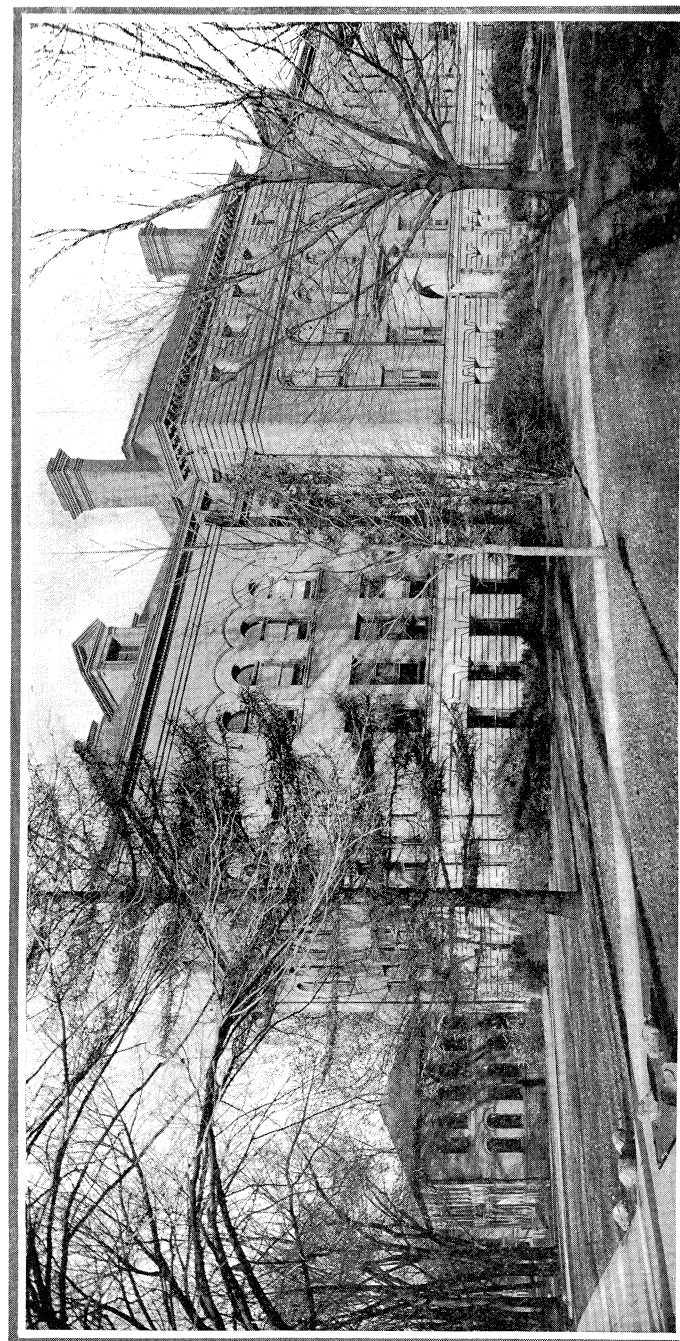
APR 1 1919

THE COLLEGE OF ENGINEERING  
AND  
ENGINEERING EXPERIMENT STATION  
OF THE  
UNIVERSITY OF ILLINOIS

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A PICTORIAL DESCRIPTION

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ENGINEERING HALL

The main offices of the College of Engineering and the Engineering Experiment Station, the department offices of Architecture and Architectural Engineering, Civil Engineering, Municipal and Sanitary Engineering, the Engineering Library and the Ricker Library of Architecture are located in this building.

UNIVERSITY OF ILLINOIS BULLETIN

Vol. XVI

January 6, 1919

No. 19

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URBANA, ILLINOIS

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## THE COLLEGE OF ENGINEERING

**T**HIS pictorial description of the buildings, laboratories and other facilities for the instruction of students of engineering and for engineering research afforded by the College of Engineering and Engineering Experiment Station has been prepared to mark the Fiftieth Anniversary of the founding of the University of Illinois and the Fifteenth Anniversary of the organization of the Engineering Experiment Station. It is presented for the information of those who are interested in the progress of engineering education, and of young men who aspire to become engineers.

The half century which has passed since the opening of the University of Illinois has been one of marvelous achievements in engineering and science, and in their application to the development of modern industry. During this period engineering has been advanced from an art to a science. It is now recognized as a profession which is indispensable to the maintenance and development of modern civilization.

Fifty years ago few institutions in America offered instruction in engineering. Some progress had then been made in the education of civil engineers, and many of the colleges gave courses in surveying and drawing in addition to their regular work in mathematics, physics, chemistry and other subjects which are fundamental to the training of engineers. The organization of the "Land Grant Colleges,"—of which the University of Illinois is one—under the provisions of the Morrill Act of 1862, provided instruction in agriculture and the mechanic arts "in order to promote the liberal and practical education of the industrial classes in

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## COLLEGE OF ENGINEERING

the several pursuits and professions of life." The establishment of these state institutions under federal aid marked the beginning of a really effective effort to train men for the practice of engineering.

From its beginning, the University of Illinois provided instruction in civil engineering, mechanical engineering, and architectural construction. Because of the increasing knowledge of pure and applied science and of the greater demands for men having highly specialized training, the work of the College of Engineering has been gradually extended and strengthened until now it includes twelve four-year curriculums, each of which leads to the degree of Bachelor of Science. These are in architecture, architectural engineering, ceramic engineering, civil engineering, electrical engineering, mechanical engineering, mining engineering, municipal and sanitary engineering, general engineering physics, railway civil engineering, railway electrical engineering and railway mechanical engineering. As now organized, the College includes ten departments, as follows:

### THE DEPARTMENT OF ARCHITECTURE

THE Department of Architecture offers two curriculums, one in architecture and the other in architectural engineering. The former deals principally with the questions of artistic design and the latter with those of technical design involving safe construction and the mechanical equipment of buildings and engineering structures. Instruction is given in free-hand drawing and water-color work; in architectural design and decoration; in the preparation of working drawings; in the design of structures and buildings, including those of stone, concrete and steel; in plumbing, heating and ventilation, and in the general equipment of buildings.

The department has a large collection of casts from famous statuary and from historic buildings, together with an

## ENGINEERING EXPERIMENT STATION

unusual collection of lantern slides illustrating the history of the architecture of all nations. The Ricker Library of Architecture, located in and operated by the department, contains one of the best collections of books on architecture and related subjects to be found in America.

### THE DEPARTMENT OF CERAMIC ENGINEERING

CERAMIC engineering is concerned with the technology of the industries engaged in the manufacture of clay, glass, cement, lime, gypsum, enameled ware and related products. The technical instruction given in the department includes studies of the chemical and physical properties of clay and all other ceramic materials, and of their manufacture and use. It deals also with the design, construction and operation of plants for the manufacture of ceramic products.

The department is located in a new building containing unusually well equipped laboratories and other facilities for instruction and research. The Kiln House contains a variety of clay working machinery and several types of coal, gas and oil fired kilns.

### THE DEPARTMENT OF CIVIL ENGINEERING

THE curriculum in civil engineering affords specialized training in the construction and maintenance of highways, in irrigation, drainage and the reclamation of land, and gives general consideration to hydro-economics. It emphasizes structural engineering, including the theory, design and construction of masonry, reinforced concrete and steel bridges, viaducts, buildings and other structures.

The department embraces Cement and Highway Laboratories which afford opportunities for the study of the various materials employed in the construction of roads and pavements. It maintains a large equipment of surveying and other instruments essential to the profession.

## COLLEGE OF ENGINEERING

### THE DEPARTMENT OF ELECTRICAL ENGINEERING

THE work of this department includes instruction in the design, care and maintenance of electrical apparatus of all kinds, the generation and distribution of electrical energy, and its application in the development of power, in lighting, and in telegraphy, telephony and wireless signaling.

The department has well appointed laboratories and a large equipment of generators, motors, transformers, measuring instruments, and other electrical apparatus essential for instruction and for scientific research.

### THE DEPARTMENT OF GENERAL ENGINEERING DRAWING

THIS department is organized to provide instruction in mechanical drawing, descriptive geometry and blue-printing which are required of all engineering students during their freshman year. It endeavors to familiarize the student with the use of drafting instruments in the execution of drawings demanding skill in their use and in free-hand lettering, together with a knowledge of tracing and blue-printing.

The department occupies the whole of the third floor of the Transportation Building. It is provided with a number of large and well appointed drawing rooms, lecture rooms and offices, a blue-printing room equipped with an electric blue-printing machine, washing trays and drying racks, and a printing room containing a complete printing plant.

### THE DEPARTMENT OF MECHANICAL ENGINEERING

MECHANICAL engineering deals with problems connected with the generation and transmission of power, with the design, construction, operation and testing of machinery of all kinds, and with the application of power and machines

## ENGINEERING EXPERIMENT STATION

to the varied requirements of modern industry. Specialized instruction is given in steam and gas power engineering, mechanical refrigeration, machine design, heating and ventilation, power transmission, the manufacture of machines and the management of manufacturing and other industrial plants.

The designing rooms, shop laboratories and power laboratory are well suited to the needs of the department; they are comparable with the best of similar laboratories in other institutions.

### THE DEPARTMENT OF MINING ENGINEERING

THE Department of Mining Engineering prepares students for work in the mining, preparation and treatment of coal and ores of all kinds, in the design and operation of metallurgical and mining plants and mining machinery, and in the field examination and prospecting of ore, coal and oil lands. In addition, attention is given to mine surveying, to the use of explosives, and to the problems connected with quarrying, timbering, tunneling and shaft sinking.

Because of its excellent laboratory equipment and of the proximity of extensive mines, quarries, smelters, steel works and other metallurgical establishments in Illinois, this department affords unusual opportunities for the training of mining and metallurgical engineers.

### THE DEPARTMENT OF MUNICIPAL AND SANITARY ENGINEERING

THE curriculum in municipal and sanitary engineering affords training in the design, construction and operation of municipal public works, and considers generally the needs of city and community development.

The department is concerned with the solution of engi-

## COLLEGE OF ENGINEERING

neering problems affecting the public health and welfare, as the supply and distribution of potable water, the construction of means for furnishing a water supply, including wells, impounding reservoirs and lake intakes, and the building of water purification works, the disposal and treatment of the sewage of a city and the drainage of streets. Instruction is given in the design and construction of pavements, walks, bridges, viaducts and the several means of providing for public safety and health.

The laboratories of the department are provided with facilities for experimentation, research and instruction, some of which activities are conducted at convenient places outside the campus.

### THE DEPARTMENT OF PHYSICS

A KNOWLEDGE of physics is fundamental to the training of the engineer. He must be familiar with the laws of mechanics, heat, sound, light, electricity and magnetism. The department is organized for the instruction of students and for research work in pure and applied physics. The curriculum in general engineering physics is planned to prepare men as teachers in the engineering colleges, or for research work in the laboratories of industrial corporations.

The department occupies a new, well-designed building, which has unsurpassed facilities for instruction and research in several branches of physics.

### THE DEPARTMENT OF RAILWAY ENGINEERING

THIS department administers three curriculums: one in railway civil engineering, one in railway electrical engineering, and one in railway mechanical engineering. While these curriculums are not dissimilar from the regular curriculums in civil, electrical and mechanical engineering respectively, they are planned to emphasize particularly the problems connected with the design, construction,

## ENGINEERING EXPERIMENT STATION

maintenance and operation of all kinds of railway equipment and structures.

The department occupies a portion of the Transportation Building. It is provided with a Locomotive Testing Laboratory which is superior to any similar laboratory in the world. It possesses a dynamometer car for the study of train resistance, and an electric railway test car for the investigation of electric traction.

### THE DEPARTMENT OF THEORETICAL AND APPLIED MECHANICS

ALL students of engineering are given instruction in mechanics, the science which deals with the forces and deformations which must be considered in the design and construction of bridges, buildings, machines and other engineering structures, the materials of engineering and the motions set up in machines. The work of this department also includes instruction in hydraulics, which deals with the flow of water through pipes, canals, channels and conduits, and the problems to be solved in the development of water power.

The laboratory of Applied Mechanics is well equipped with materials-testing machinery for both instruction and research. The Hydraulics Laboratory has a variety of equipment to illustrate the laws governing the flow of water.

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Full information concerning the requirements for admission to the University and for graduation from the College of Engineering, together with descriptions of the several curriculums, the various courses of study, and the list of fees, is contained in the Annual Register of the University, copies of which will be mailed free upon request to the Registrar of the University, or the Dean of the College of Engineering.



## THE ENGINEERING EXPERIMENT STATION

THE Engineering Experiment Station of the University of Illinois is an organization within the College of Engineering. It was created by an act of the Board of Trustees on December 8, 1903, to stimulate and to elevate engineering education and to investigate problems of special importance to professional engineers and to the manufacturing, railway, mining and other industrial interests of the State and of the country. The knowledge thus obtained is made available through the publication of bulletins presenting the results of original research, and of circulars containing compilations of important information not otherwise readily accessible to the interests to be served.

The control of the Station is vested in an Executive Staff composed of the Director and his Assistant, the Heads of the several departments of the College of Engineering and the Professor of Industrial Chemistry. This staff is responsible for the establishment of general policies governing the work of the Station, including the approval of material presented for publication. While all members of the teaching staff of the College are encouraged to engage in scientific research, it is conducted chiefly by the Research Corps composed of full-time research assistants, research graduate assistants and special investigators. Those employed for special investigations are engaged for a limited time on a single problem.

The University of Illinois now maintains fourteen Research Graduate Assistantships in the Engineering

## ENGINEERING EXPERIMENT STATION

Experiment Station. In addition, two Research Graduate Assistantships in Gas Engineering have been established under the patronage of the Illinois Gas Association. These Assistantships are open to graduates of approved American and foreign universities and technical schools who are prepared to undertake graduate study in engineering, physics or applied chemistry. Each assistantship carries a stipend of five hundred dollars and freedom from tuition, incidental and laboratory fees. Appointment to these positions must be accepted for two consecutive collegiate years, at the expiration of which period, if all requirements have been met, the degree of Master of Science will be conferred. Not more than half of the time of these assistants, during ten months of each year, is required in connection with the work of the department to which they are assigned; the remainder is available for graduate study.

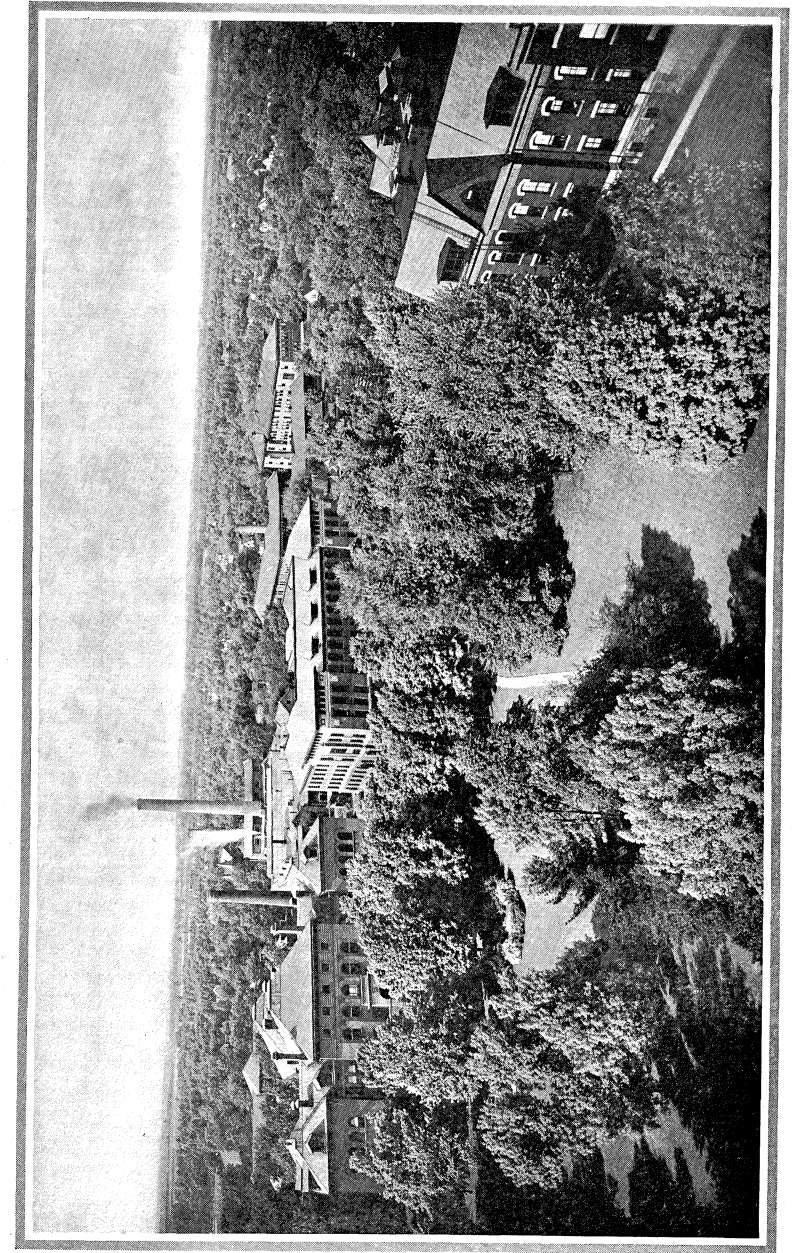
Information concerning the opportunities for graduate study in engineering will be found in the circular of the Graduate School, which may be obtained upon request to the Dean of the Graduate School. Further details regarding appointment to the Research Graduate Assistantships will be supplied upon request by the Director of the Engineering Experiment Station.

The Station has already published one hundred and ten bulletins and eight circulars. All these publications are regarded as contributions to the literature of engineering, and many of them present important additions to the science of engineering. All publications are distributed free to those persons who are on the regular mailing list of the Station, and to others upon request. After the number of copies of a particular bulletin, however, has been reduced to an established limit, a small charge is made for each of those remaining for distribution. A charge is also made for duplicate copies of a particular bulletin when these are requested by an individual, unless in special cases it is deemed advantageous to the Station to furnish such dupli-

## COLLEGE OF ENGINEERING

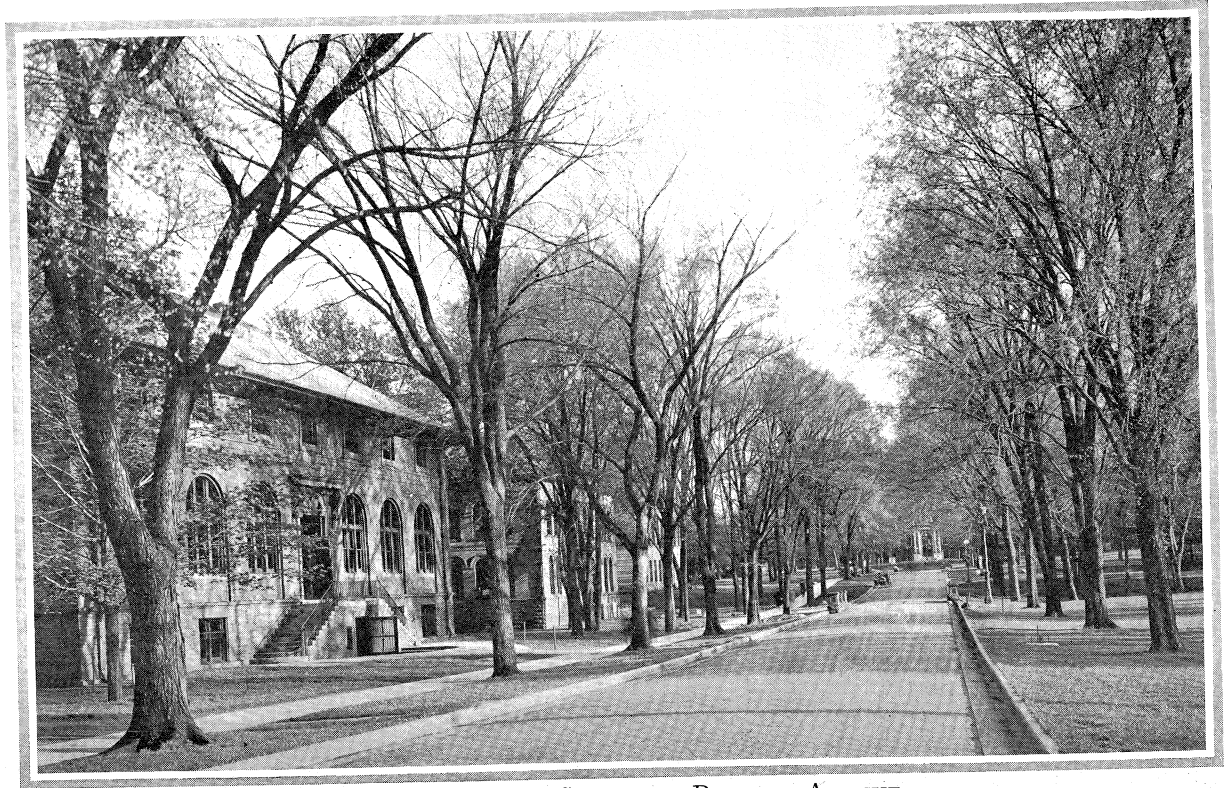
cates free. When ordered in large quantities, a special rate for bulletins may be made by the Director.

Upon request to the Director, the name of any person who desires to receive the publications of the Engineering Experiment Station, as they are issued, will be added to the regular mailing list. A complete list of the publications will be sent to any one who may desire it.

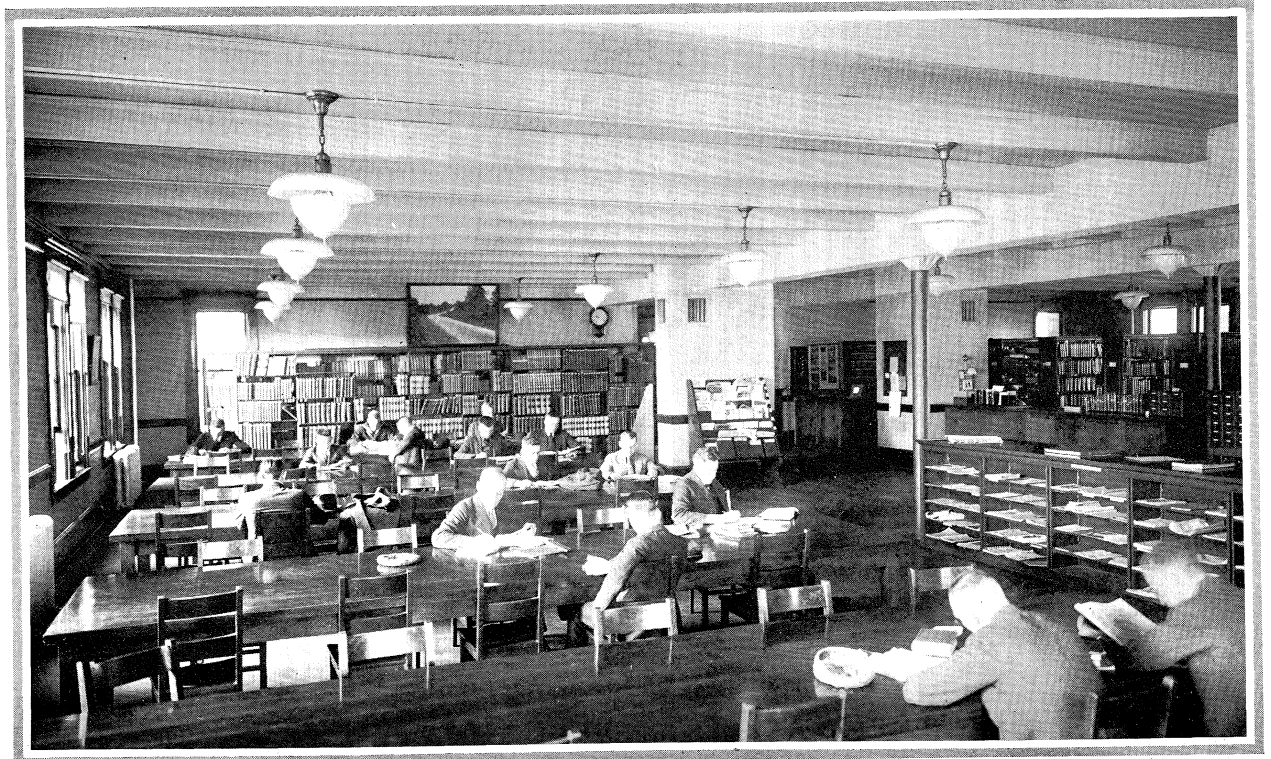


VIEW OF THE COLLEGE OF ENGINEERING FROM THE TOWER OF UNIVERSITY HALL





VIEW LOOKING SOUTH ON BURRILL AVENUE  
COLLEGE OF ENGINEERING BUILDINGS ON THE LEFT



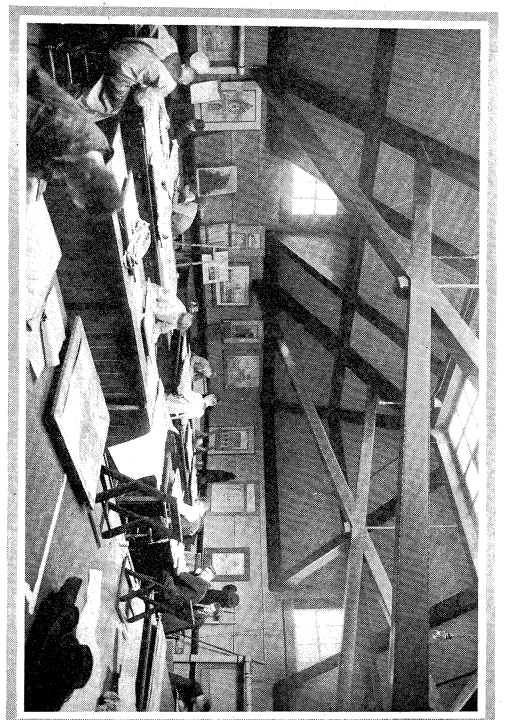
THE ENGINEERING LIBRARY



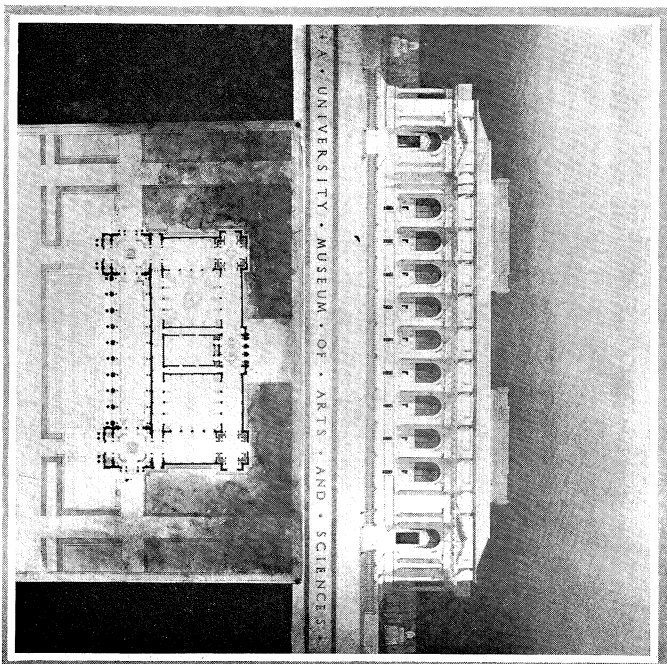


THE RICKER LIBRARY OF ARCHITECTURE FOURTH FLOOR OF ENGINEERING HALL

This is one of the best working libraries in the country. It contains about 4,000 volumes on Architecture and the allied arts, 10,000 lantern slides, several thousand mounted plates and an interesting collection of photographs.

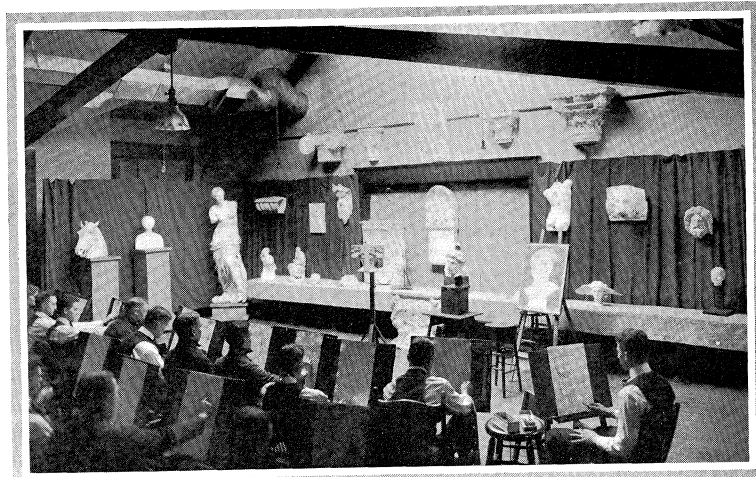


SENIOR DRAFTING ROOM  
FOURTH FLOOR ENGINEERING HALL

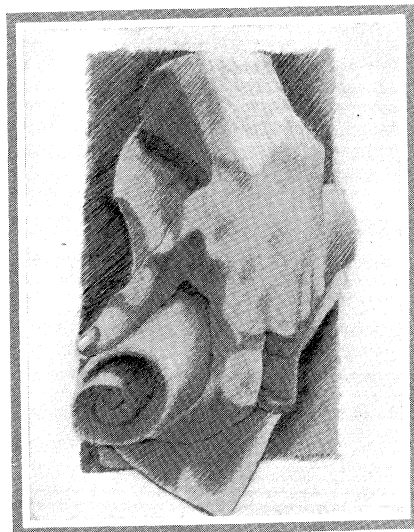


ARCHITECTURAL DESIGN  
SENIOR WORK

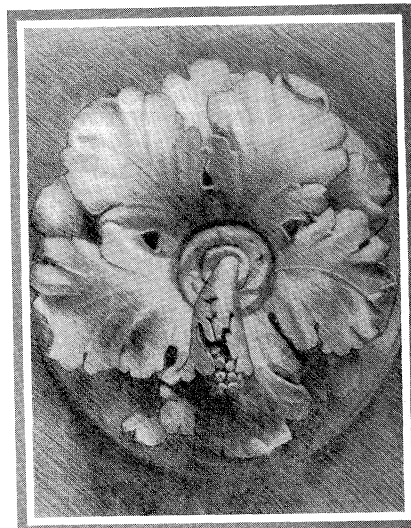
DEPARTMENT OF ARCHITECTURE



STUDIO FOR FREEHAND DRAWING  
ENGINEERING HALL

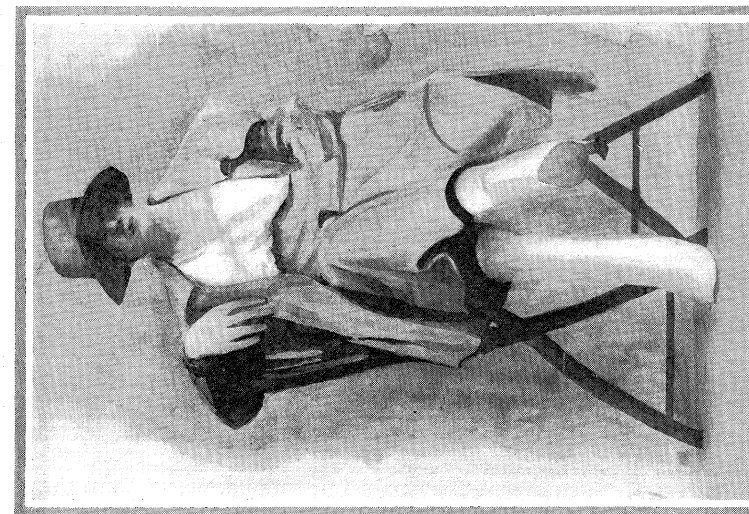


CHARCOAL DRAWING  
STUDENT WORK

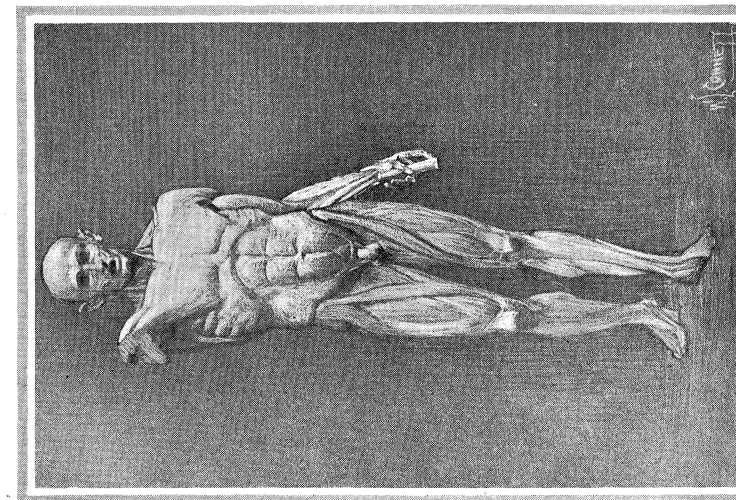


PENCIL DRAWING  
STUDENT WORK

DEPARTMENT OF ARCHITECTURE



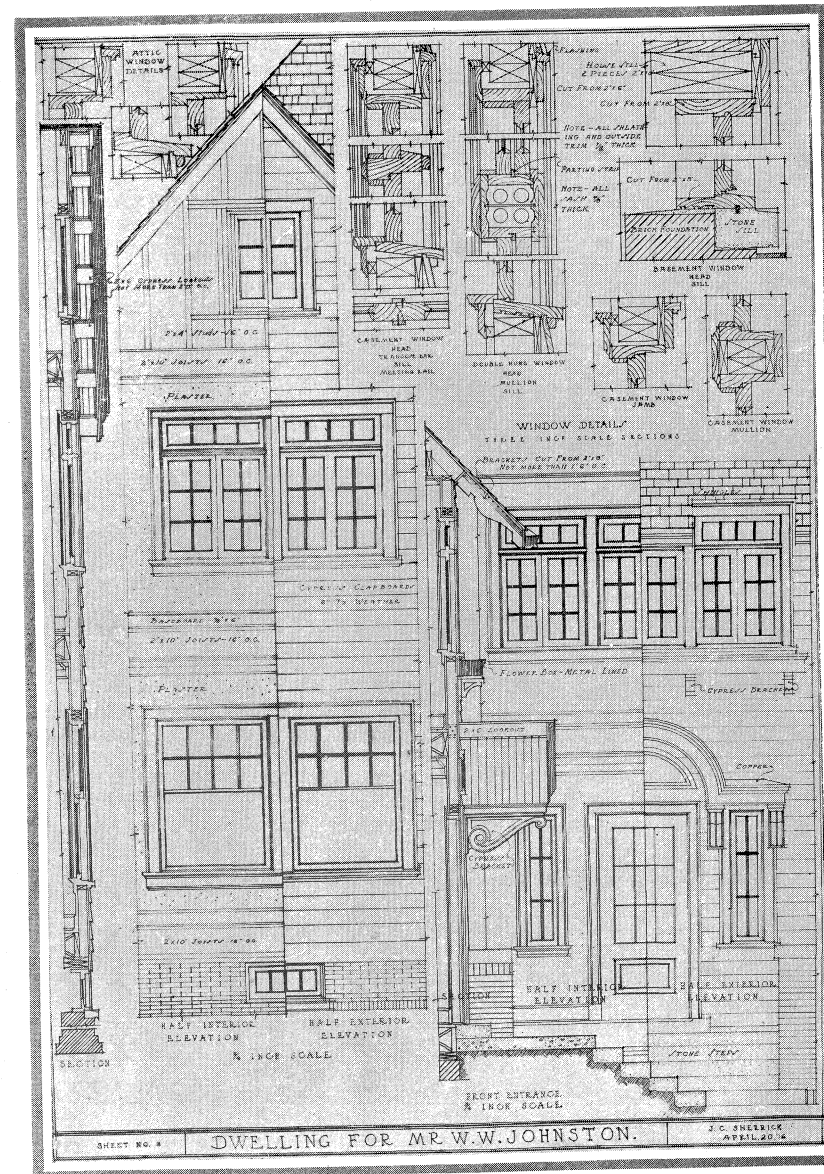
DRAWING FROM LIFE



ANATOMICAL DRAWING

DEPARTMENT OF ARCHITECTURE

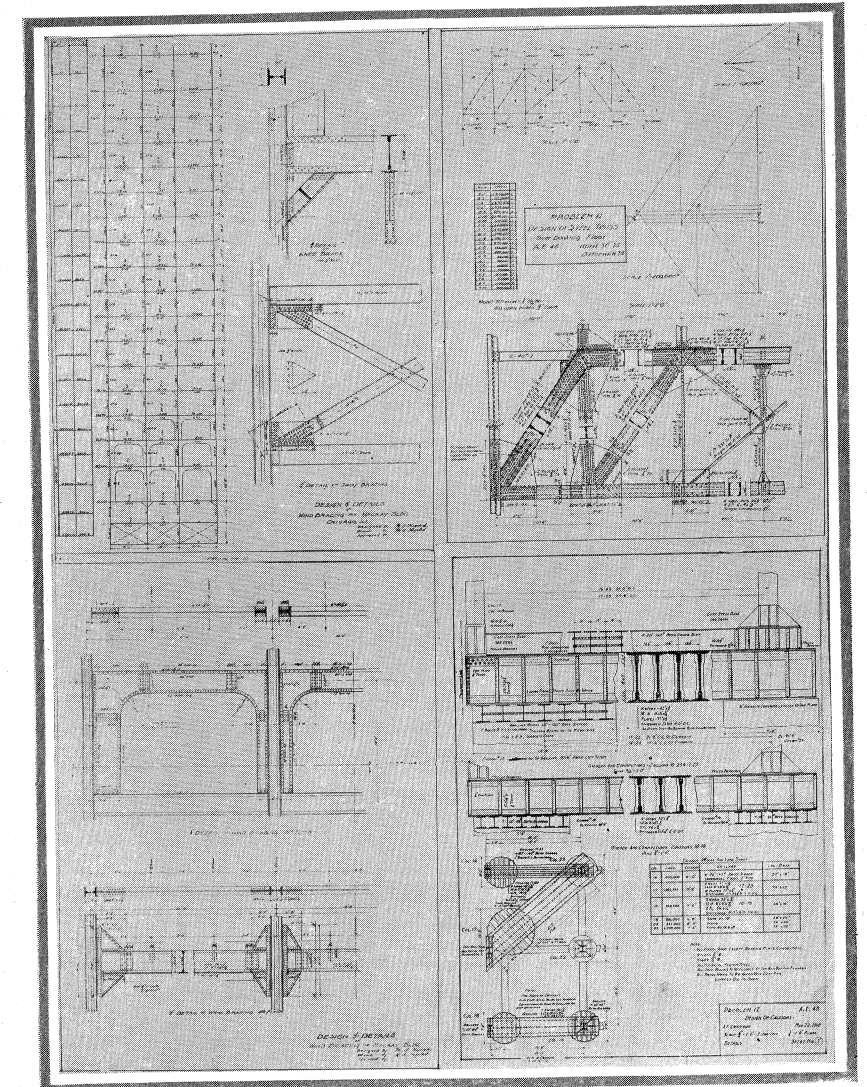




WORKING DRAWINGS AND CONSTRUCTION FOR A DWELLING

SOPHOMORE WORK

DEPARTMENT OF ARCHITECTURE



ENGINEERING DESIGN FOR A SEVENTEEN STORY OFFICE BUILDING

ARCHITECTURAL ENGINEERING

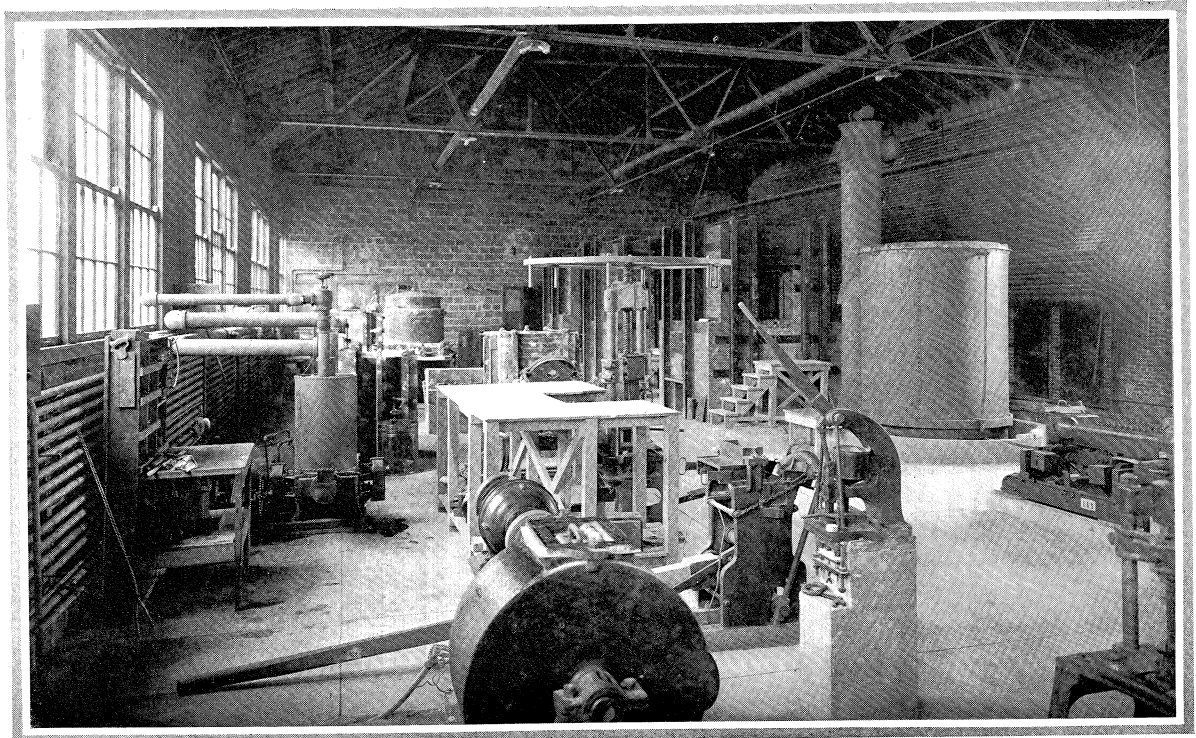
SENIOR WORK

DEPARTMENT OF ARCHITECTURE



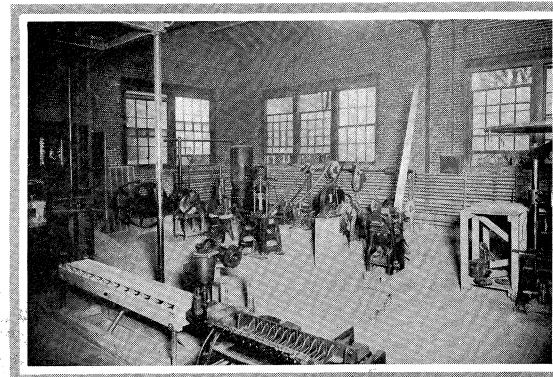
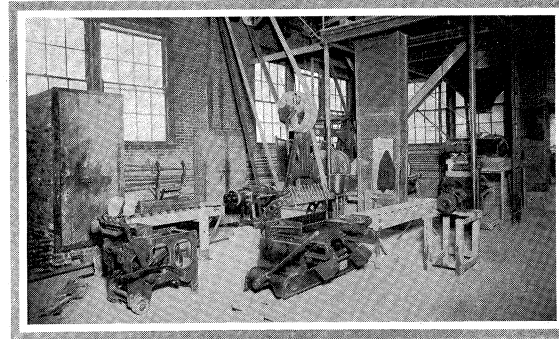


FRONT VIEW OF THE CERAMIC ENGINEERING BUILDING

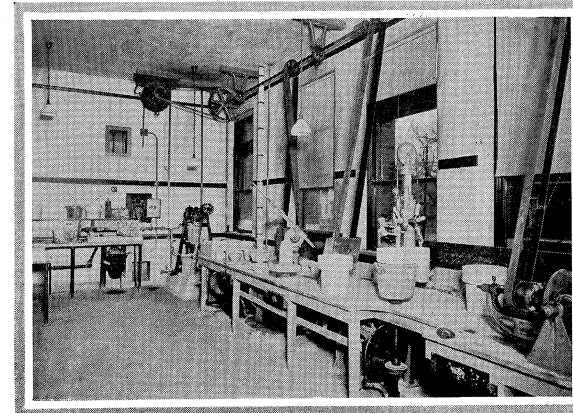


FURNACE EQUIPMENT IN THE KILN HOUSE  
DEPARTMENT OF CERAMIC ENGINEERING

BRICK  
MAKING  
EQUIPMENT



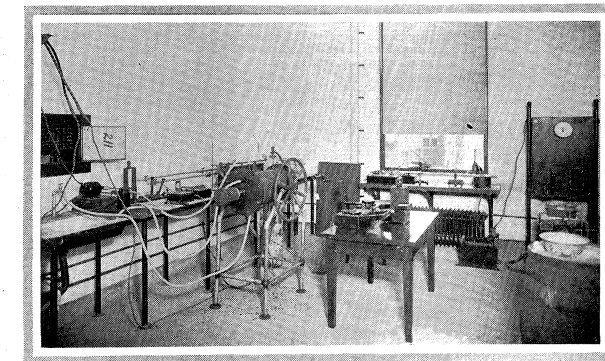
GRINDING MACHINERY AND PRESSES



POTTERY  
LABORATORY

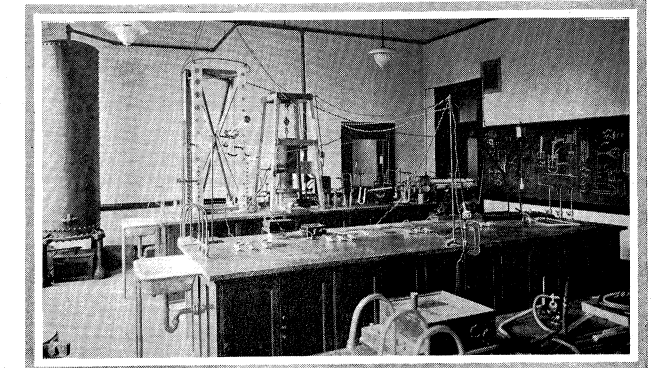
DEPARTMENT OF CERAMIC ENGINEERING

A CORNER  
IN THE  
MUSEUM



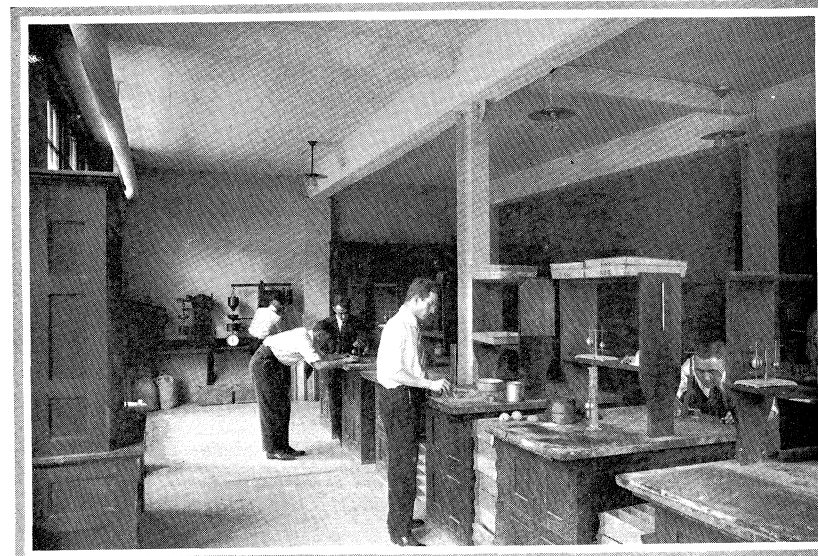
ELECTRIC  
FURNACE  
IN THE  
HIGH  
TEMPERATURE  
LABORATORY

A  
RESEARCH  
LABORATORY

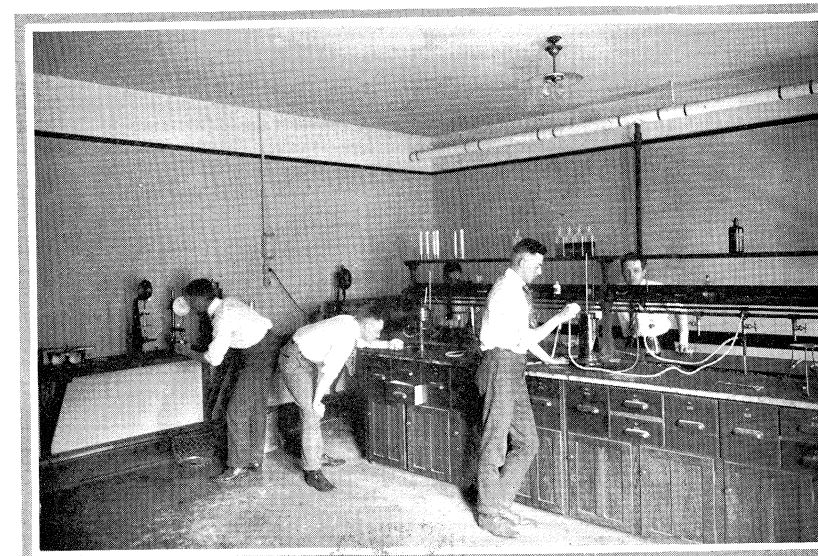


DEPARTMENT OF CERAMIC ENGINEERING

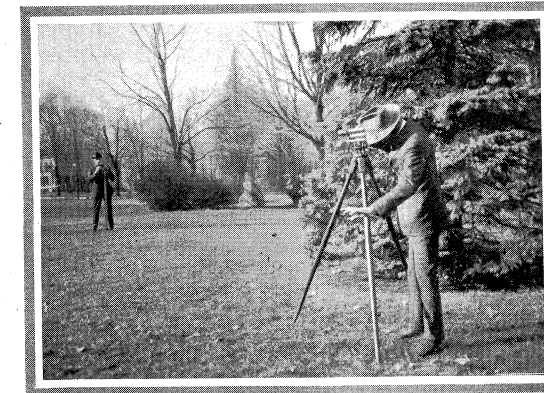




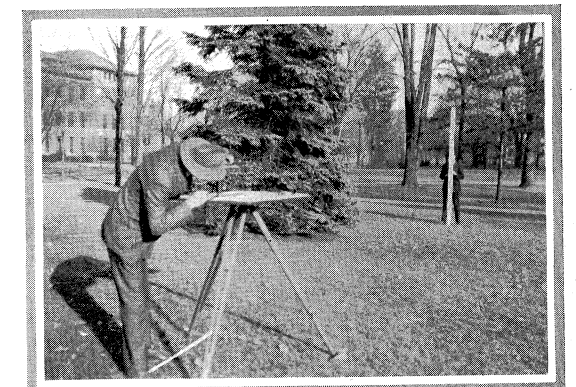
VIEW IN THE CEMENT TESTING LABORATORY  
STUDENTS testing the various kinds of commercial cements



VIEW IN THE ROAD MATERIALS TESTING LABORATORY  
STUDENTS examining the materials used in road building  
DEPARTMENT OF CIVIL ENGINEERING

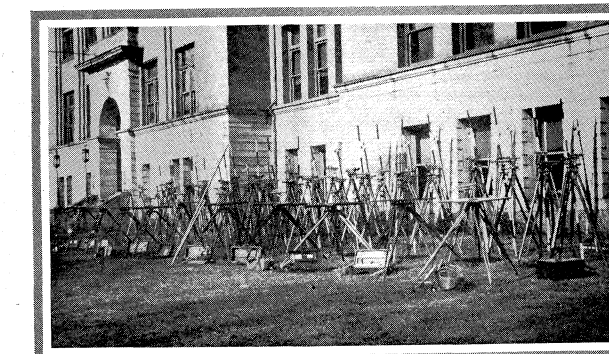


STUDENTS  
USING AN  
ENGINEER'S  
LEVEL



STUDENTS make topo-  
graphical surveys using  
similar instruments and  
the same methods as em-  
ployed by the United  
States Geological Survey.

CLASSWORK WITH A PLANE TABLE



A GROUP of tran-  
sits, levels and plane  
tables with their ac-  
cessories.

INSTRUMENTS FOR USE IN SURVEYING

DEPARTMENT OF CIVIL ENGINEERING



STUDY OF  
SUPER-ELEVATION  
ON  
ROADS



OPENING a small defective spot to determine the cause of failure.

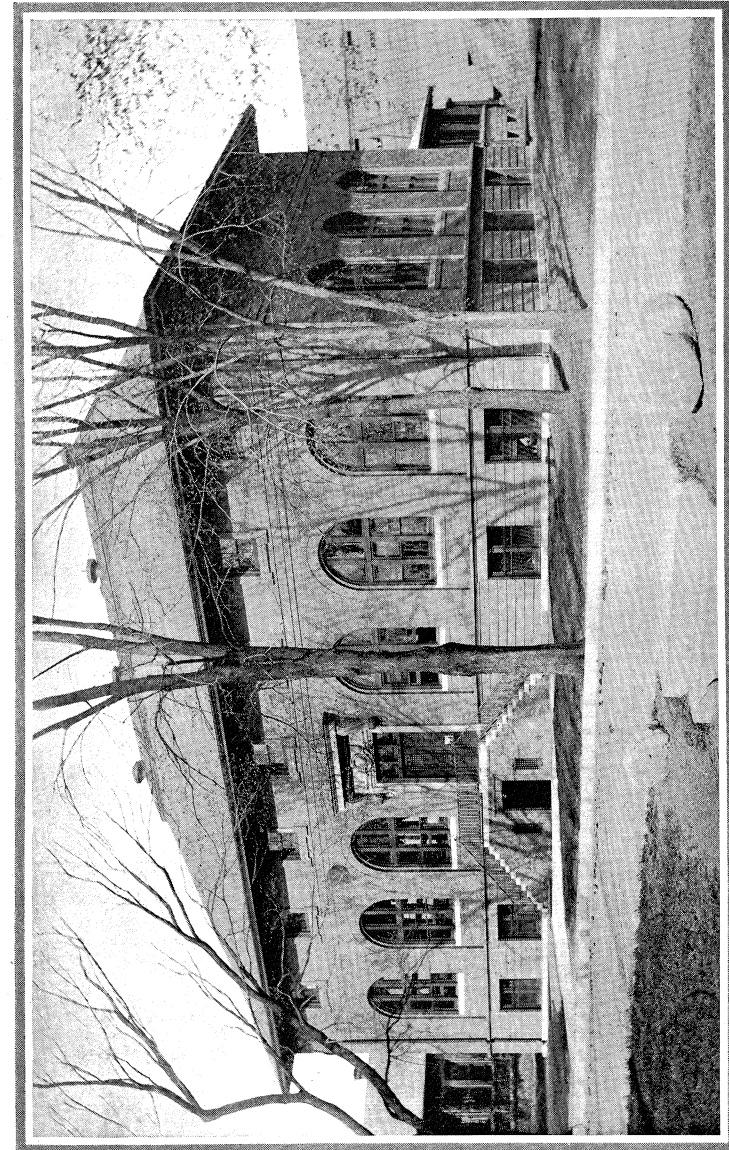
REPAIR ON BRICK ROAD

THE instrument gives a continuous record of the temperature in and under the pavement and also of the air.



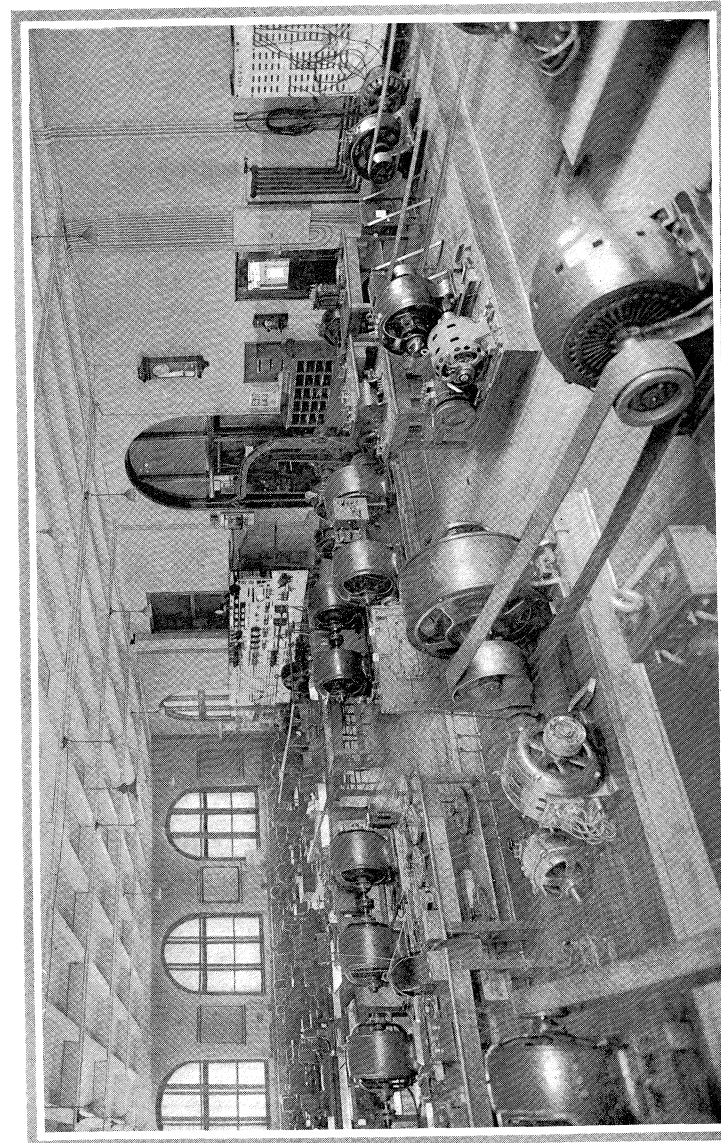
ROAD THERMOGRAPH

DEPARTMENT OF CIVIL ENGINEERING



ELECTRICAL LABORATORY IN WHICH IS HOUSED MOST OF THE ELECTRICAL APPARATUS AND EQUIPMENT USED FOR INSTRUCTION AND RESEARCH

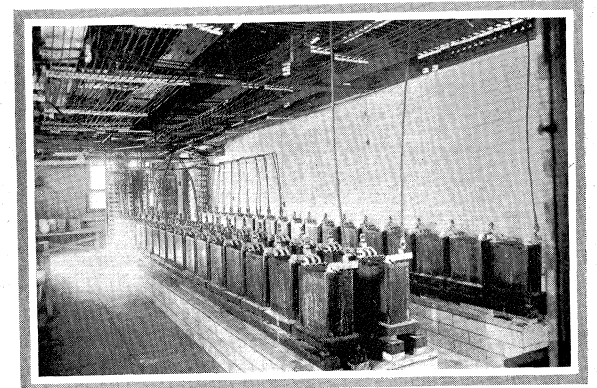
DEPARTMENT OF ELECTRICAL ENGINEERING



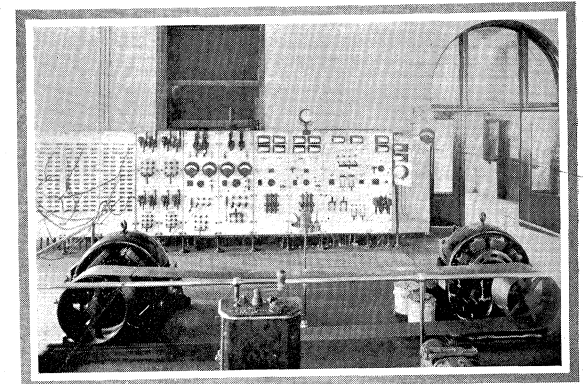
INTERIOR VIEW OF THE ELECTRICAL MACHINERY LABORATORY SHOWING VARIOUS TYPES OF GENERATOR AND MOTOR UNITS

DEPARTMENT OF ELECTRICAL ENGINEERING

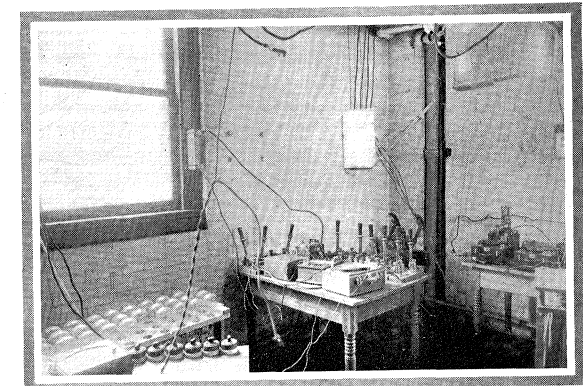
STORAGE  
BATTERY  
TESTING  
LABORATORY



SWITCH  
BOARD

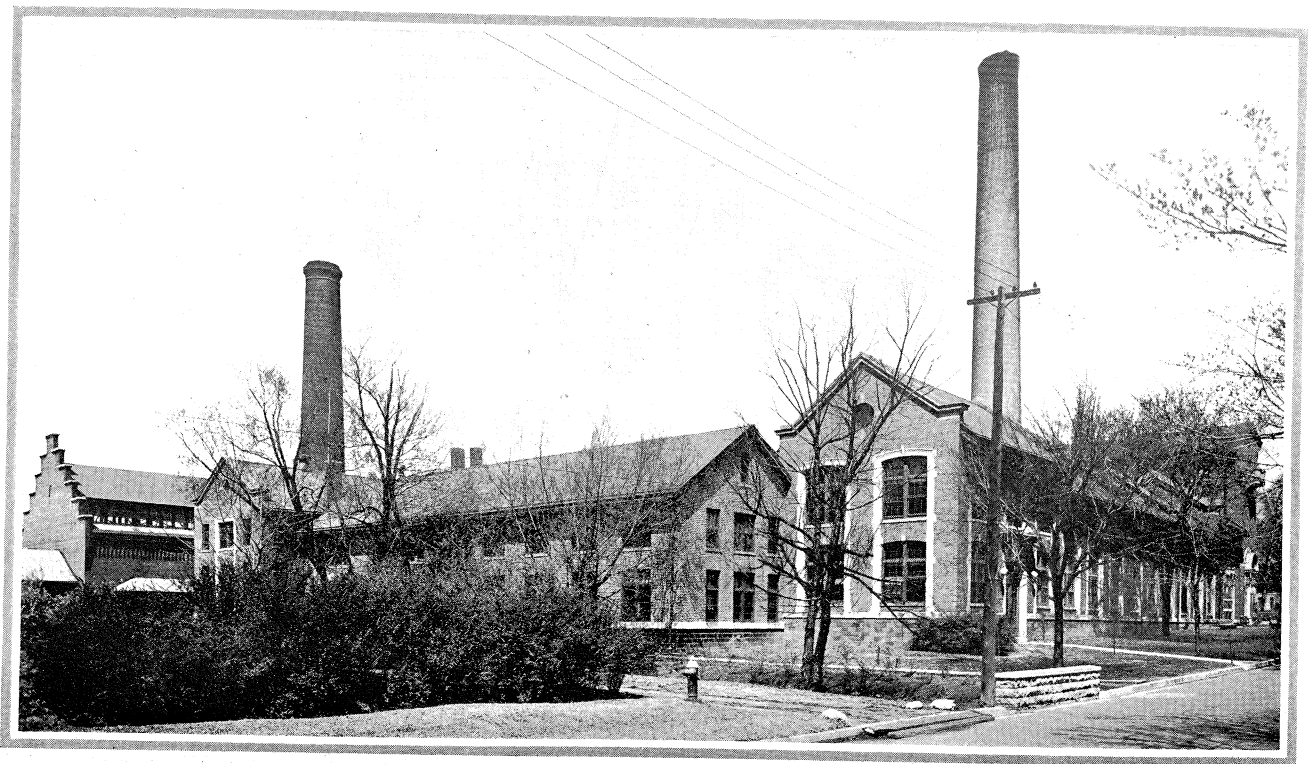


APPARATUS  
USED FOR  
TESTING  
INCANDESCENT  
LAMPS

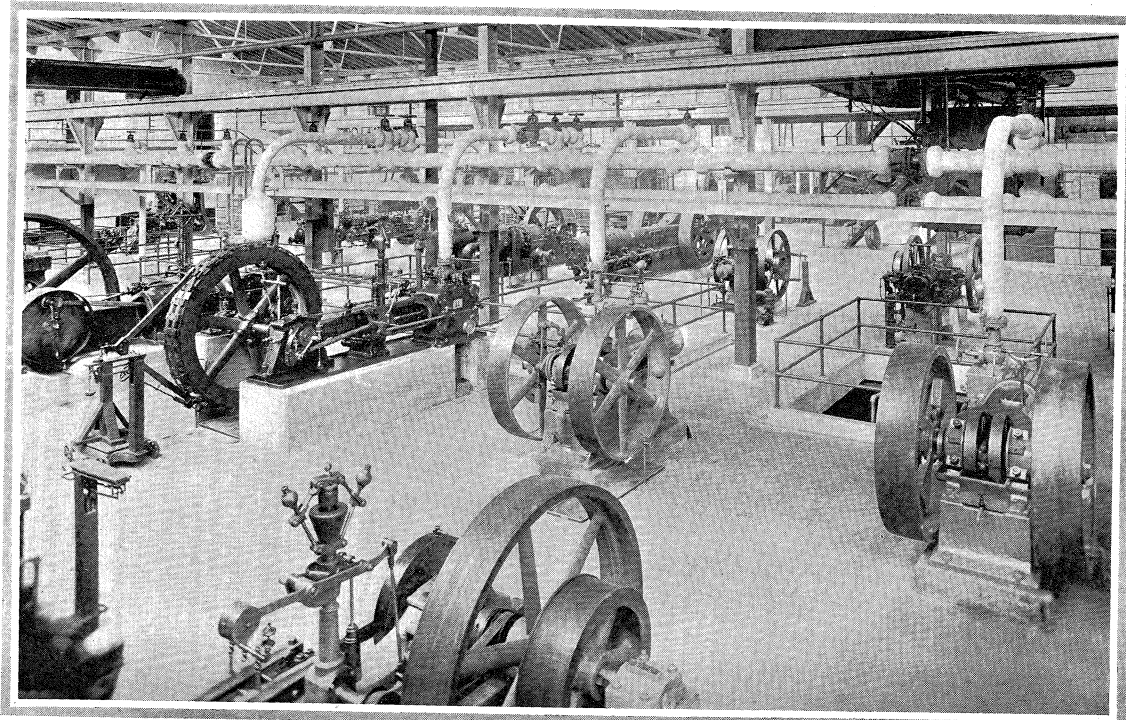


DEPARTMENT OF ELECTRICAL ENGINEERING





EXTERIOR VIEW OF THE MECHANICAL ENGINEERING BUILDING

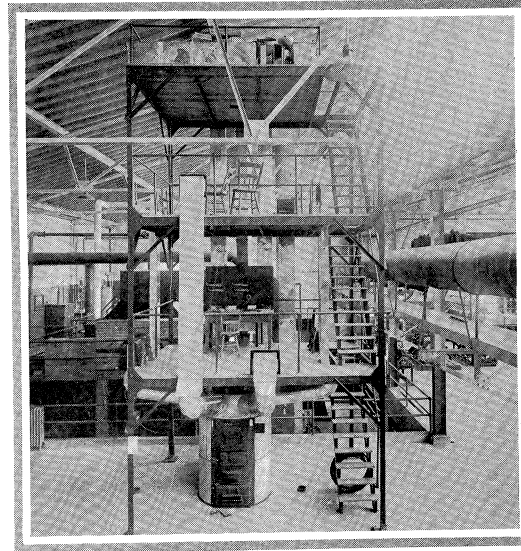


THE MEZZANINE FLOOR OF THE POWER LABORATORY

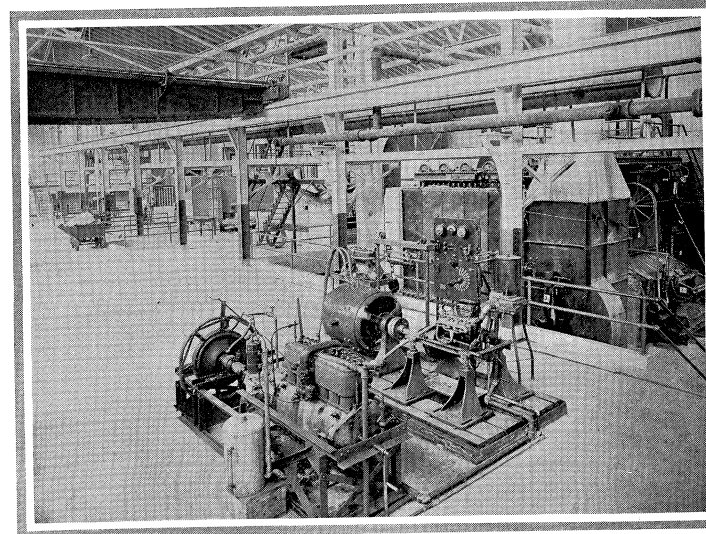
THIS laboratory is well equipped for instruction and research in steam and gas power engineering, refrigeration, and heating and ventilation.

DEPARTMENT OF MECHANICAL ENGINEERING





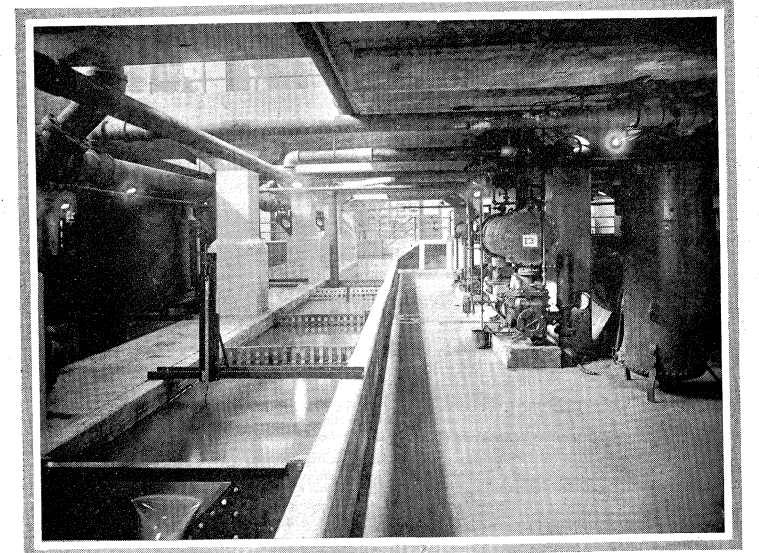
FURNACE TESTING PLANT



A CORNER OF THE POWER LABORATORY

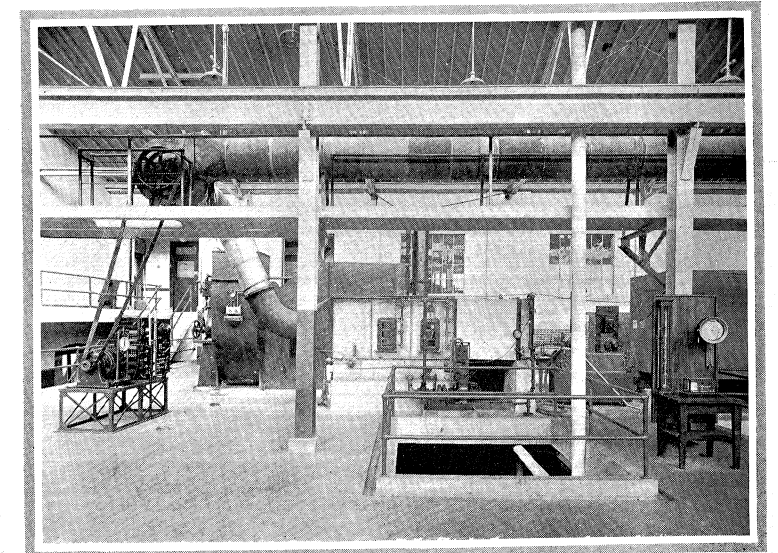
This view shows, in the foreground, the electric and hydraulic dynamometers for testing high speed gasoline engines and, in the background, the experimental boiler plant including a 210 horsepower boiler with chain grates, an economizer, induced draft fan and steam superheater.

DEPARTMENT OF MECHANICAL ENGINEERING



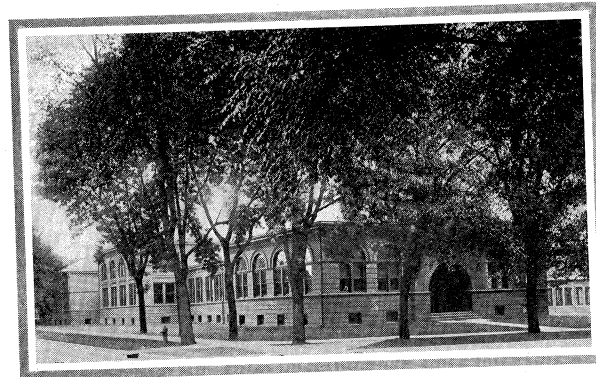
FIRST FLOOR OF POWER LABORATORY

On this floor is located the various auxiliary power equipment including steam condensers, flumes for measuring water and the freezing tank and brine coolers for the refrigerating machines.

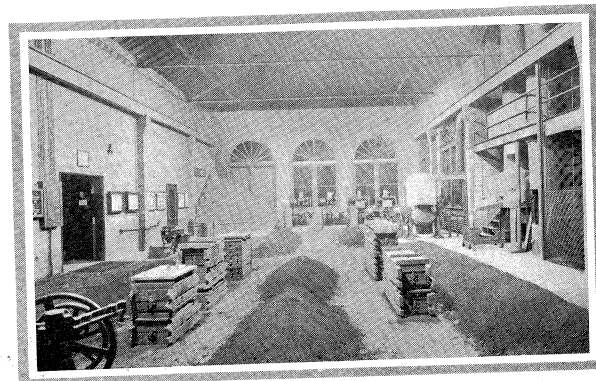


HEATING AND VENTILATION EQUIPMENT  
IN THE POWER LABORATORY

DEPARTMENT OF MECHANICAL ENGINEERING



EXTERIOR  
VIEW OF  
THE  
WOOD SHOP  
AND  
FOUNDRY  
BUILDING



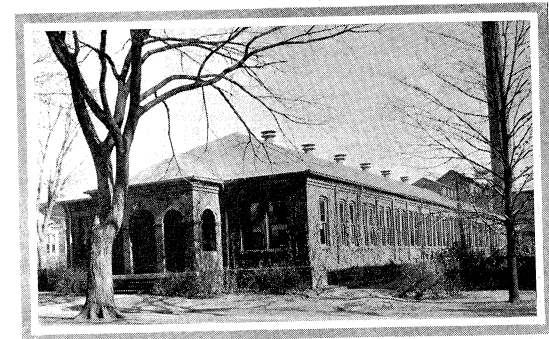
INTERIOR  
VIEW  
OF THE  
FOUNDRY



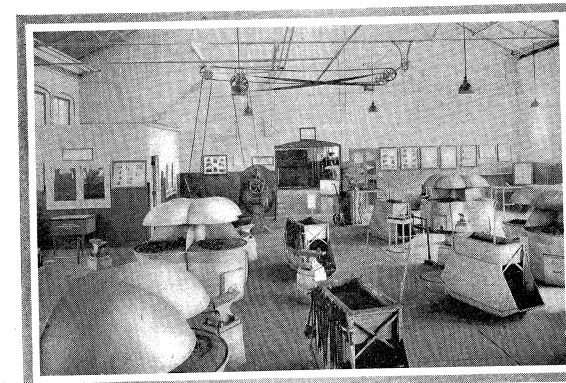
INTERIOR VIEW OF THE PATTERN SHOP

THIS shop is equipped with all power machinery and hand tools necessary for general woodworking and pattern making.

DEPARTMENT OF MECHANICAL ENGINEERING



EXTERIOR  
VIEW OF  
MACHINE  
SHOP  
BUILDING



INTERIOR  
VIEW  
OF THE  
FORGE  
SHOP

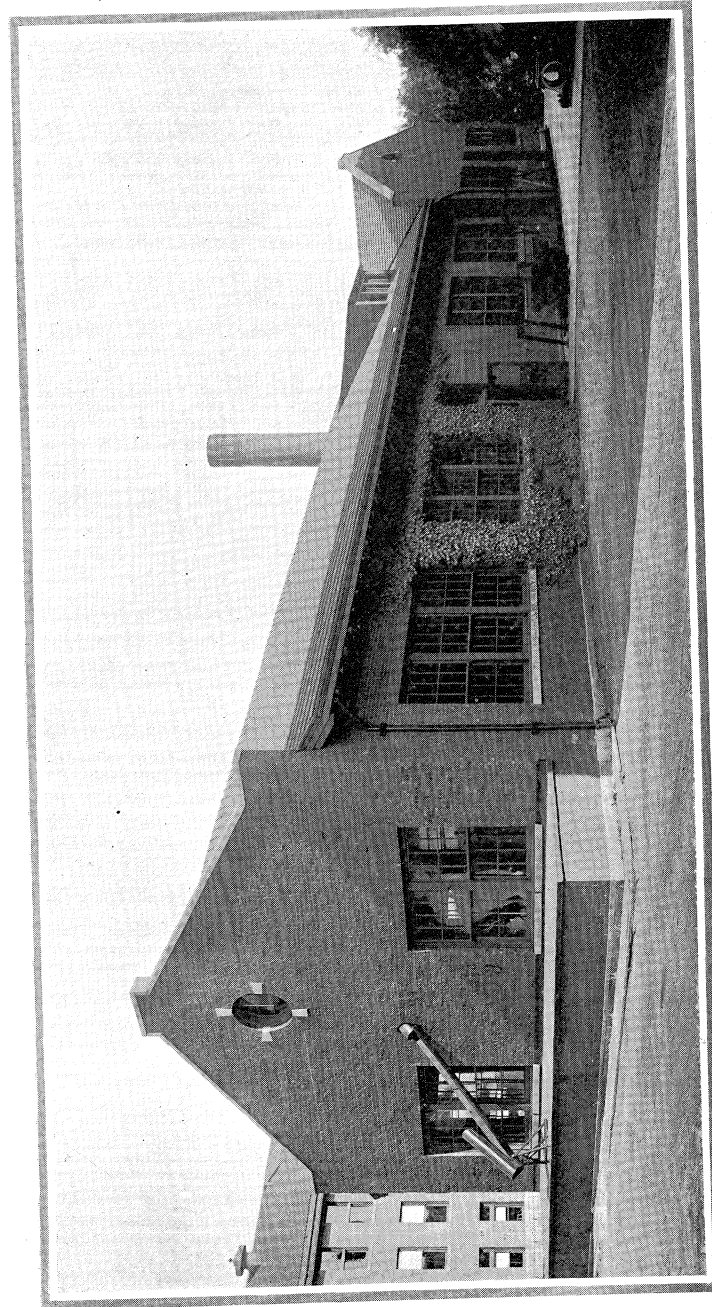


INTERIOR VIEW OF THE MACHINE SHOP

THIS shop is equipped for quantity production and the students manufacture an eight-horse-power gasoline motor on a basis comparable to commercial production.

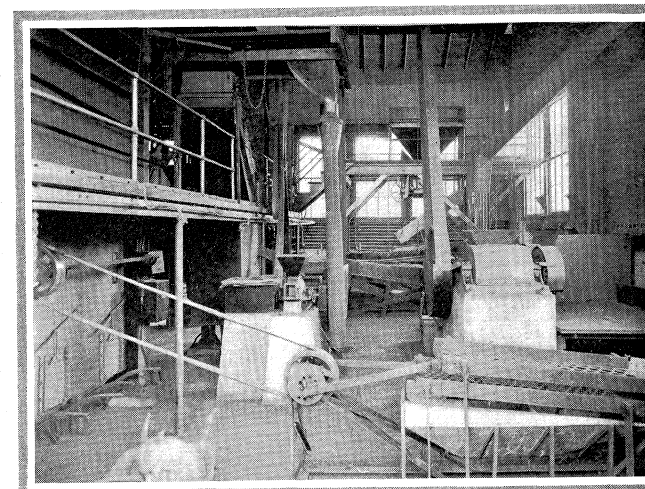
DEPARTMENT OF MECHANICAL ENGINEERING





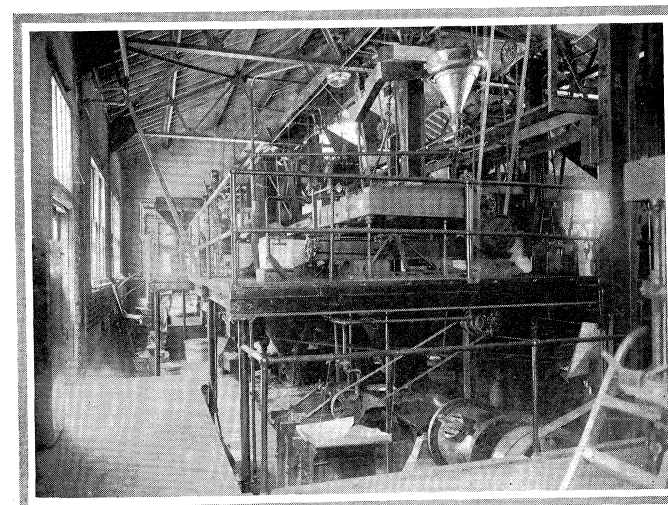
**MINING LABORATORY**

THIS building contains machinery for the preparation of ores and coal for market and for the metallurgical treatment of ores. It contains not only small appliances for scientific experimentation, but apparatus of sufficient size to permit the testing of large lots of coal and ore.



**MACHINERY FOR CRUSHING OF ORE, COAL, AND ROCK**

It is necessary to crush raw material received from the mines before it can be subjected to the various cleaning and metallurgical processes necessary to extract the metal from the ore.

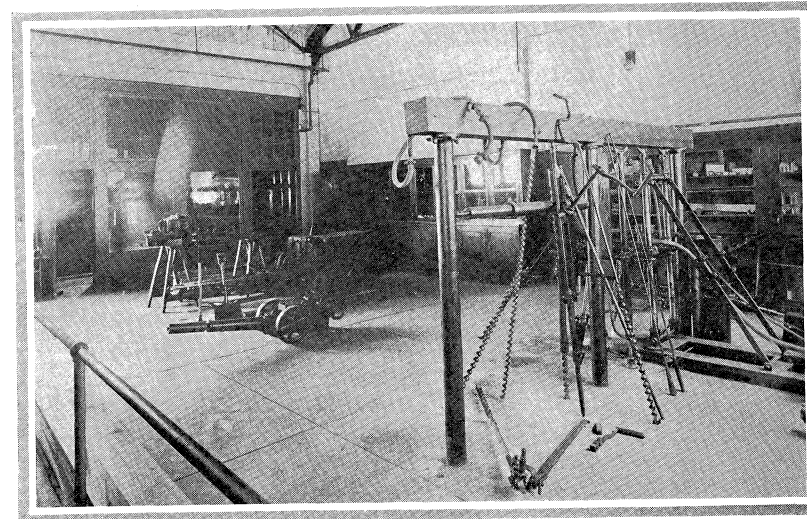


**COAL PREPARATION, ORE DRESSING,  
AND HYDRO-METALLURGICAL LABORATORY**

HALF of this laboratory is devoted to coal crushing, screening, cleaning, washing, and briquetting machinery, and other processes required in preparing coal as it comes from the mine for use in homes and industrial plants. The other half is devoted to crushing, grinding, screening and sorting of ores, and contains also appliances for treating them by amalgamation, cyanidation, flotation and other commercial processes.

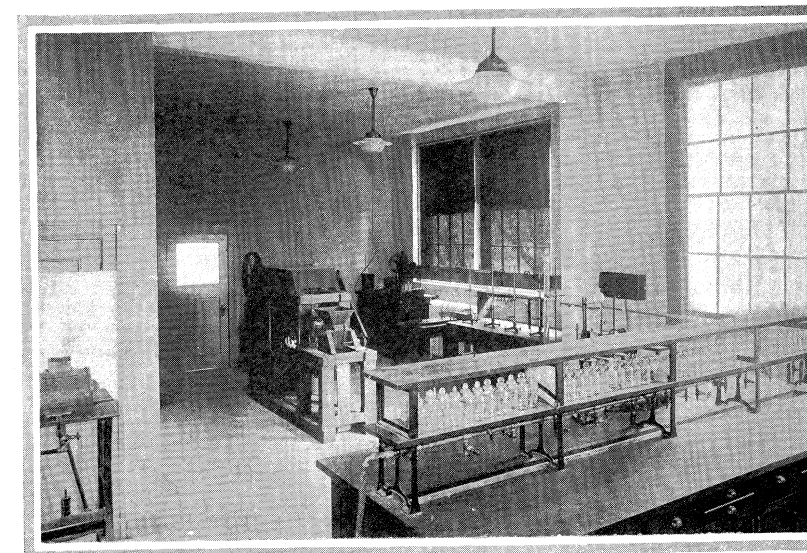
**DEPARTMENT OF MINING ENGINEERING**





Mining Machinery

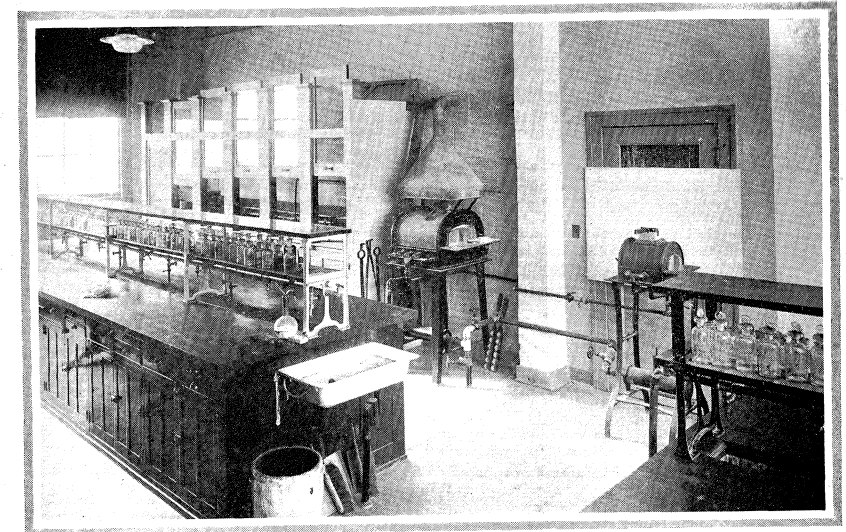
In this laboratory drilling and blasting are studied, and experimental work is carried on in connection with the extraction of coal and ores.



Auxiliary Testing Machinery

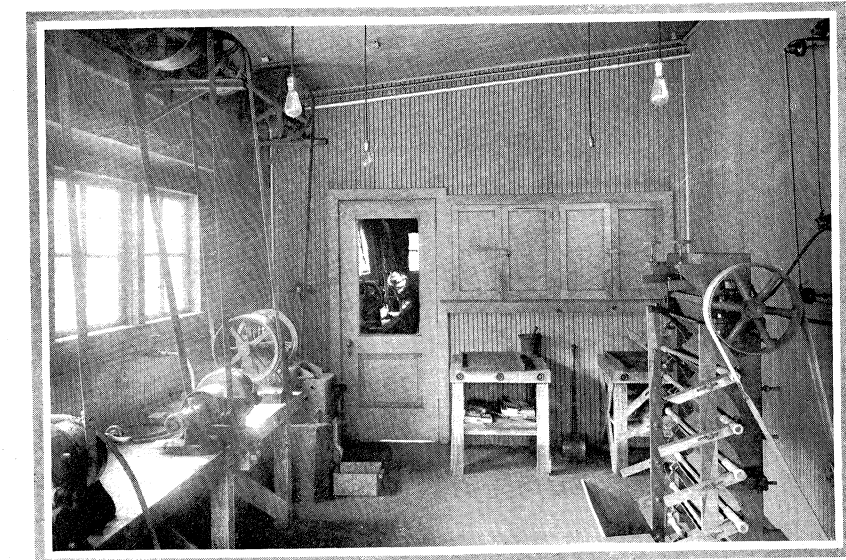
This includes a magnetic ore separator, oil flotation machines, air jigs, and other special appliances for metallurgical analysis.

DEPARTMENT OF MINING ENGINEERING



Chemical Analysis Room

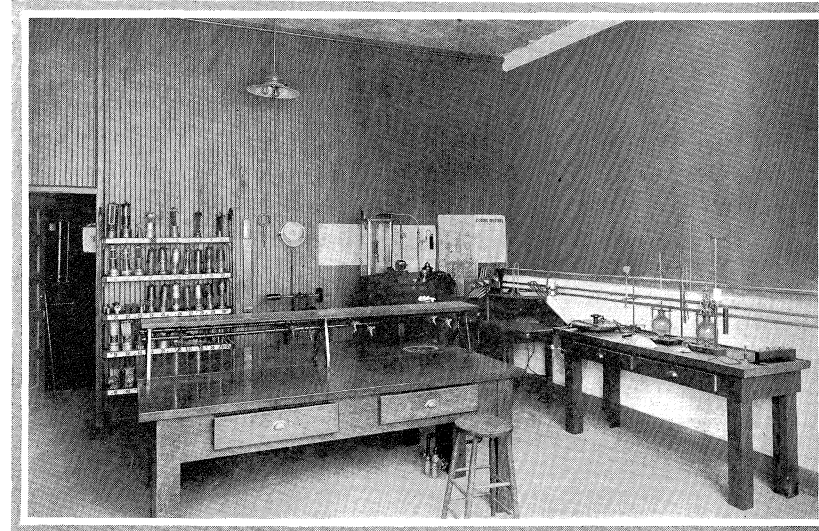
This contains the usual desks for student work, gas furnaces for assay determinations, and complete equipment of calorimeters, photo meters, and similar instruments used in testing ores and coal.



Corner of Sampling and Sample-Grinding Room

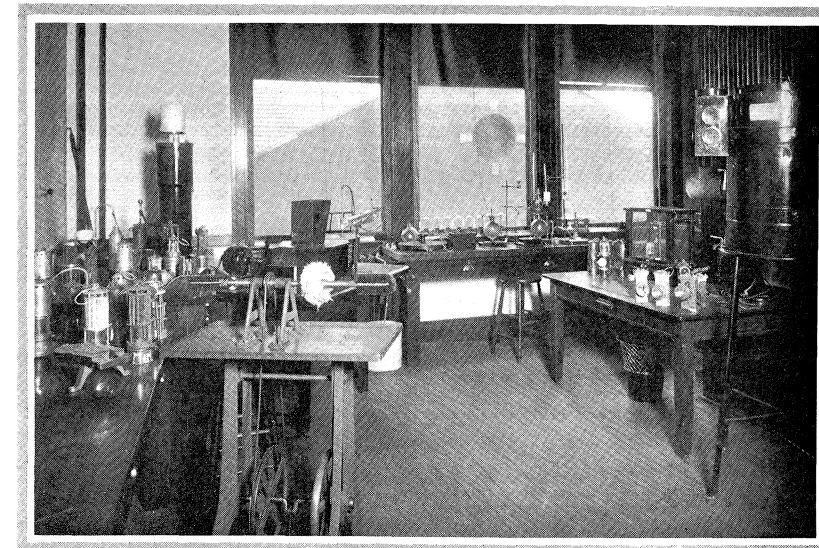
This room contains complete apparatus for pulverizing and sampling coal or ore. This is a necessary process in connection with any testing of raw material. The room also contains an electrostatic ore separator shown at the right.

DEPARTMENT OF MINING ENGINEERING



VENTILATION LABORATORY

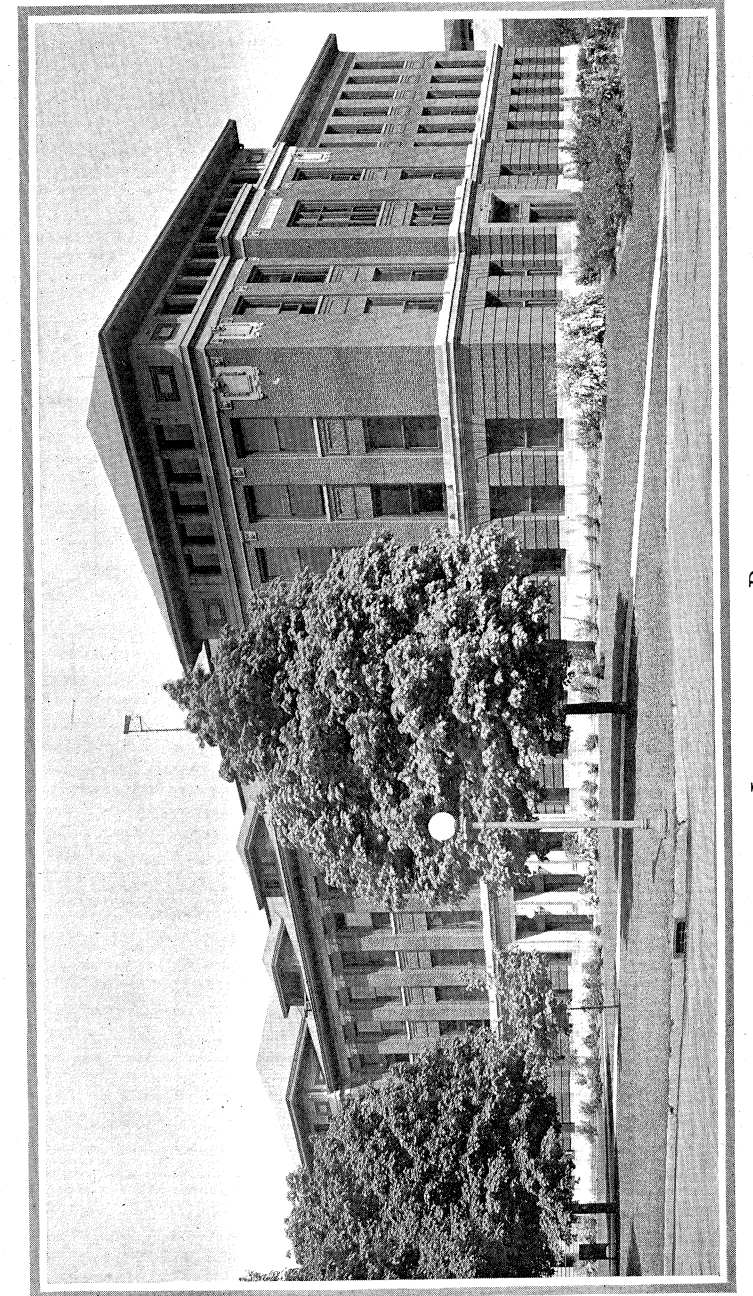
An interesting collection of safety lamps is here shown with the devices for testing them. Through the open door at the left is a dark room in which are appliances for measuring the candle power of mine lighting devices.



VENTILATION AND MINE GAS LABORATORY

This includes a small mine fan and various appliances for measuring air currents, for analysing mine gases, and for testing the explosibility of coal dust.

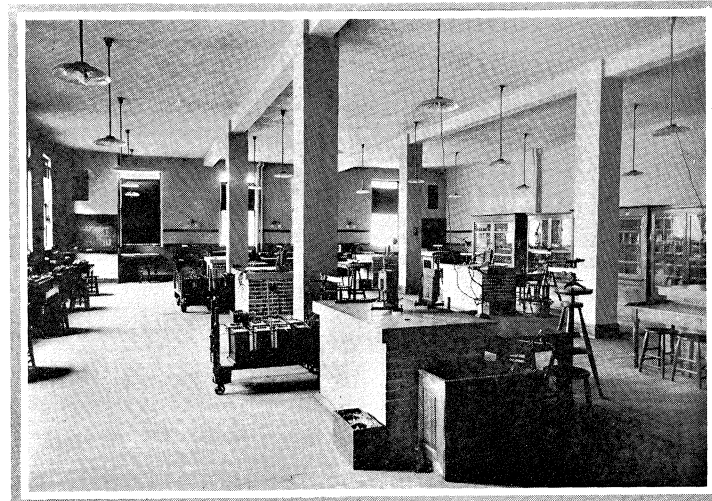
DEPARTMENT OF MINING ENGINEERING



LABORATORY OF PHYSICS

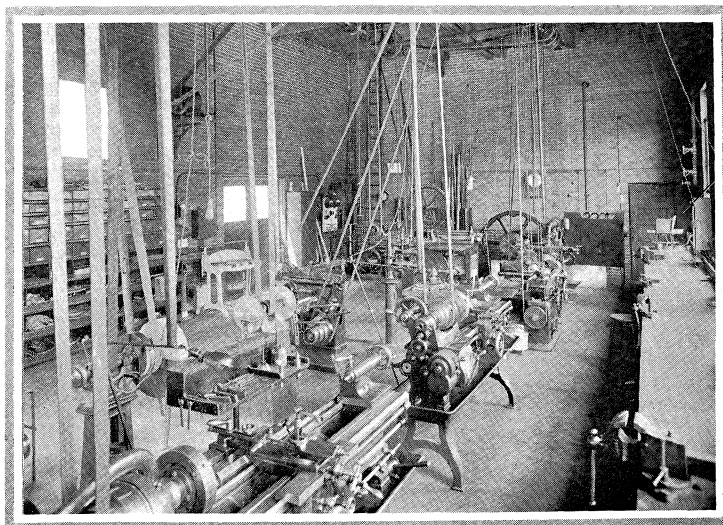
A MODERN fire-proof building completed in 1909. It was designed and equipped to afford unusually complete facilities for instruction and research in physics.





THE ELECTRICAL MEASUREMENT LABORATORY

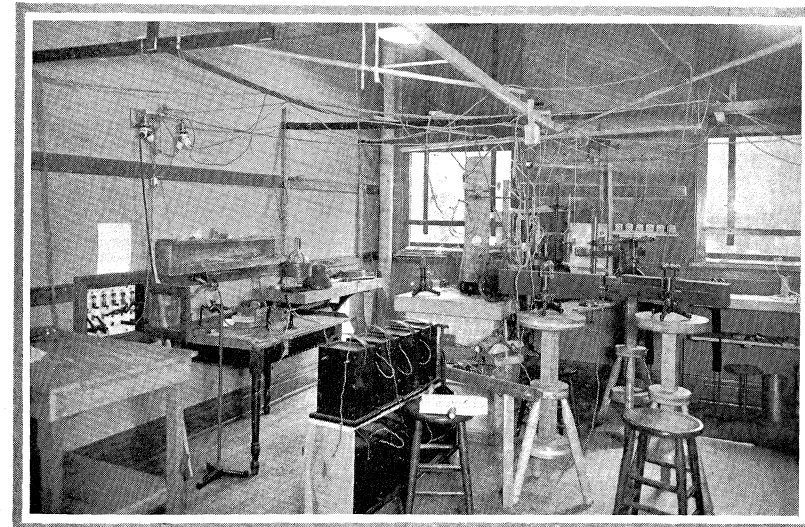
FOR advanced students in magnetic and electrical work of high precision. Calibration standards are kept corrected for use in a special even temperature room.



THE PHYSICS MACHINE SHOP

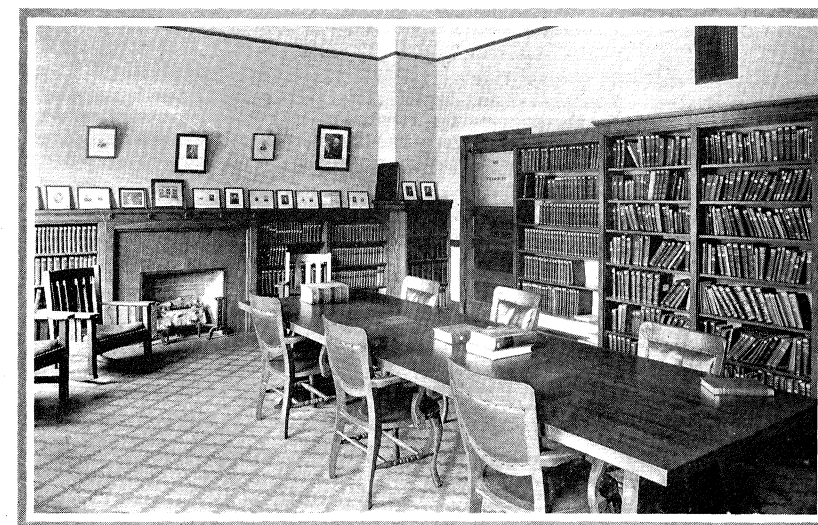
THIS shop is equipped with tools for making and repairing delicate apparatus for research and instruction. Two mechanics are employed. A compressor for liquid air is shown at the far end.

DEPARTMENT OF PHYSICS



ONE OF THE SMALL LABORATORIES  
FOR SPECIAL EXPERIMENTS AND RESEARCH

THESE laboratories are supplied with water, gas, compressed air and experimental electrical circuits, and double shades for darkening. There are twenty-five other similar laboratories.

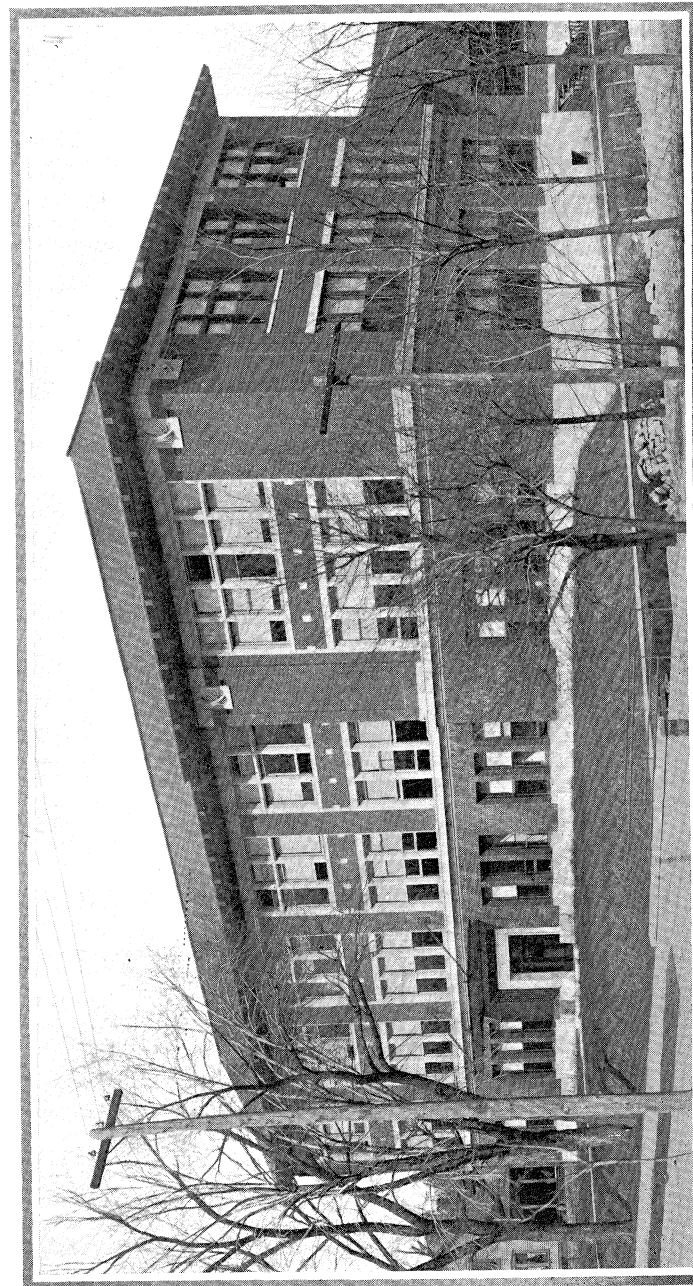


THE PHYSICS SEMINAR AND LIBRARY

THIS room contains standard reference works, the newer books, and duplicates of late series of the standard journals of physics. The main University Library is rich in sets of all the leading scientific journals and translations.

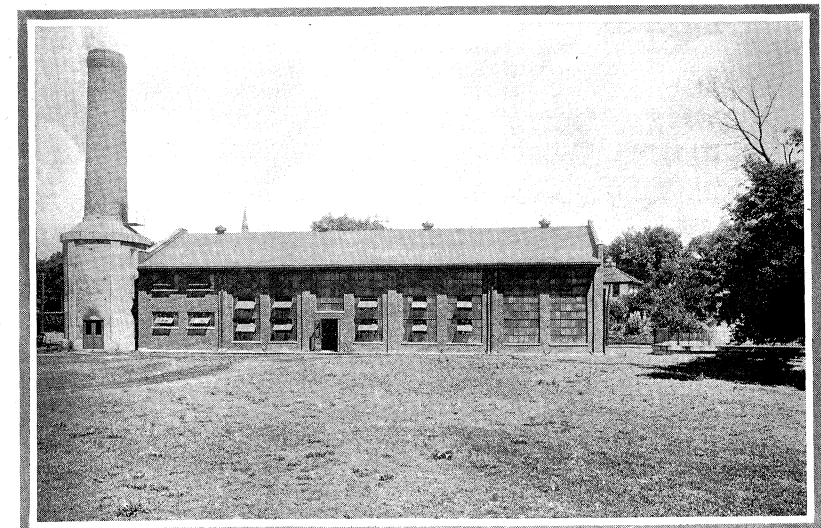
DEPARTMENT OF PHYSICS



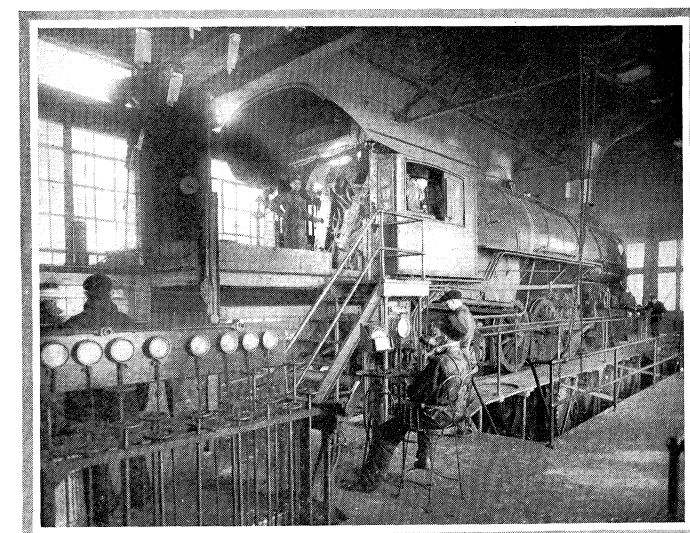


TRANSPORTATION BUILDING

This building contains the class-rooms, drafting-rooms, offices, and museums devoted to Railway Engineering, to Mining Engineering and to General Engineering Drawing.



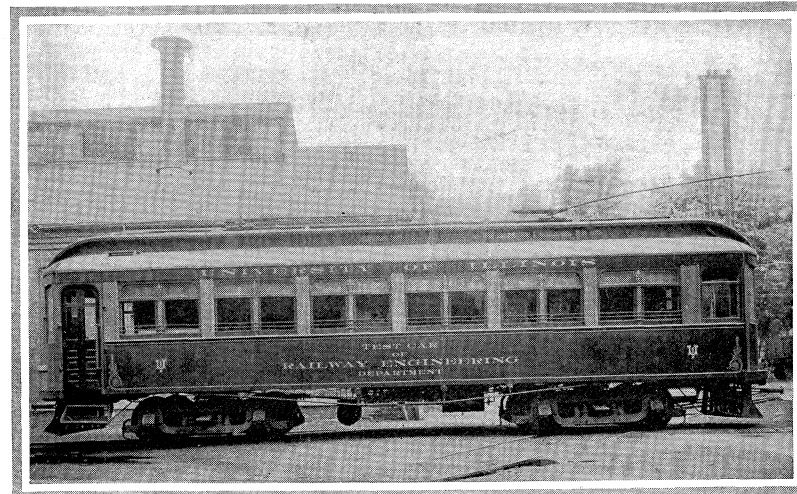
EXTERIOR VIEW LOCOMOTIVE TESTING LABORATORY



INTERIOR OF THE LOCOMOTIVE LABORATORY

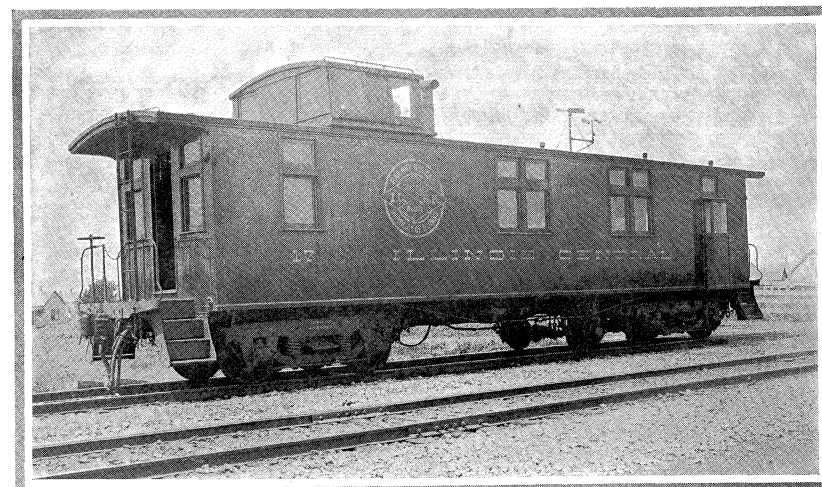
SHOWING a large Baltimore & Ohio Railway Mikado Type freight locomotive mounted on the supporting wheels which permit it to be run at various speeds and loads. The locomotive is here shown during a series of fuel tests. Other locomotives have been tested in the laboratory, which may be re-arranged to suit the dimensions of any locomotive.

DEPARTMENT OF RAILWAY ENGINEERING



THE ELECTRIC RAILWAY TEST CAR

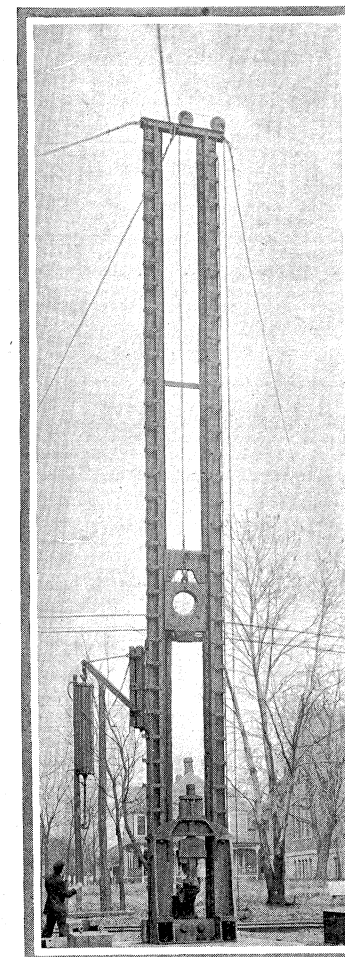
THIS car, owned by the Railway Engineering Department, is used for instruction and research. In it are two machines which make continuous graphical records of all the data needed for tests of power consumption, rail bonds, etc. By the courtesy of the Illinois Traction System and the Kankakee and Urbana Traction Co. this car is operated on their lines.



THE RAILWAY TEST CAR

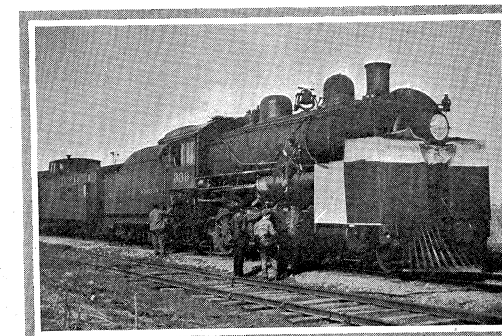
THIS dynamometer car is owned jointly by the Railway Engineering Department and the Illinois Central Railroad, and is used in instruction and research. The apparatus within it makes fifteen continuous graphical records of locomotive draw-bar pull, speed, time, and other data needed in making train resistance, tonnage rating, and locomotive tests.

DEPARTMENT OF RAILWAY ENGINEERING



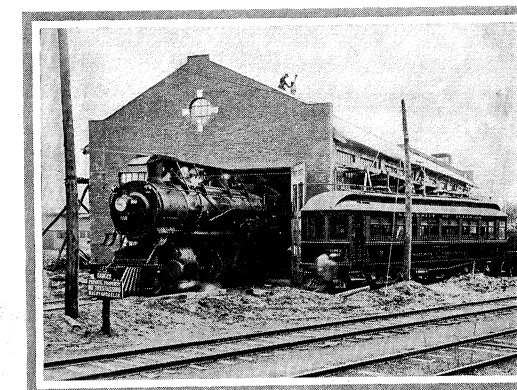
DROP TESTING MACHINE

THE 1640-pound weight drops from various heights upon a steel rail, car coupler, axle, draft gear, or other piece of equipment for the purpose of determining the strength of the material. Tests may be planned to simulate severe service conditions such as result in destruction of equipment.



THE RAILWAY TEST CAR IN USE

THIS car is being used in making tonnage rating and locomotive tests. The front end of the locomotive is arranged for taking indicator cards. This car is usually operated on the Illinois Central Railroad, but on numerous occasions it has been used on other roads. It is here shown on the Chicago Great Western Railroad. Road tests of a locomotive can be made in a more thorough and satisfactory manner when a dynamometer car is used.

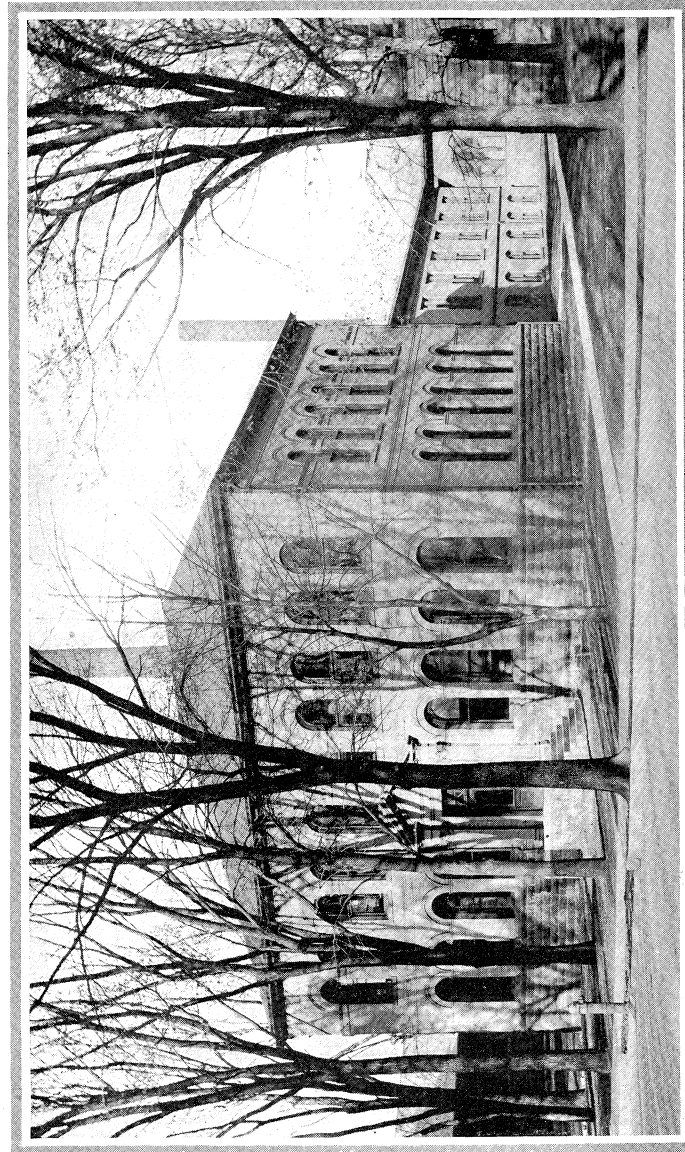


THE LOCOMOTIVE LABORATORY  
AND  
THE ELECTRIC RAILWAY TEST CAR

A LOCOMOTIVE is shown entering the laboratory for a series of tests.

DEPARTMENT OF RAILWAY ENGINEERING

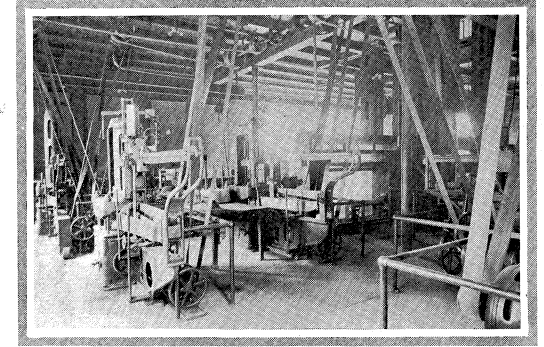




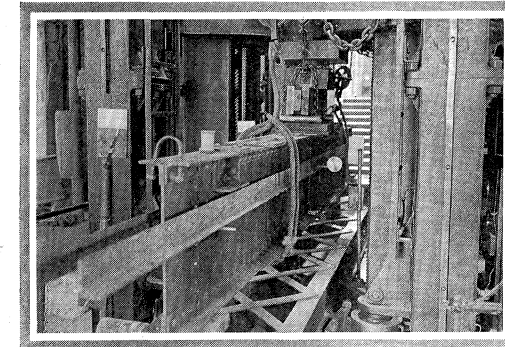
LABORATORY OF APPLIED MECHANICS

The entire lower floor (44 by 66 feet) of the front part of the building is occupied by the Materials Testing Laboratory. The second floor of the front part is occupied by offices and recitation rooms. The portion of the building to the rear is 45 by 76 feet, with two floors both occupied by the Hydraulic Laboratory. The stand pipe, which is 60 feet high, may be seen above the roof at the rear of the building.

VIEWS of one end of the laboratory showing several universal testing machines used for determining the strength in tension, compression, or bending of building materials such as iron, steel, timber, brick, or concrete.



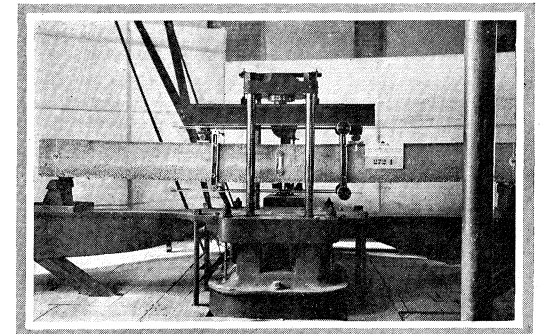
MATERIALS TESTING LABORATORY



A STEEL beam from a railroad bridge is being tested in bending. The testing machine is a huge screw-power press fitted with a massive platform scale for weighing the load applied. The screws which exert pressure can be seen in the cut. Load is applied and weighed until the beam collapses, and the deflection is measured by means of a micrometer dial shown at the middle of the beam.

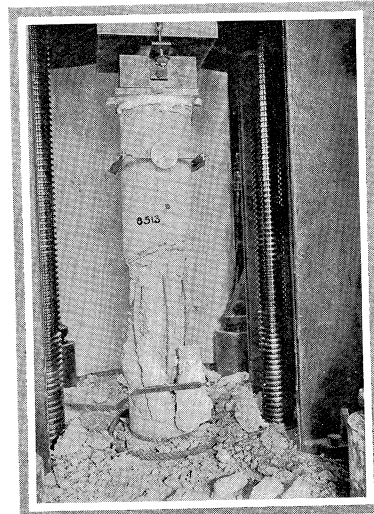
TEST OF A LARGE STEEL BEAM

THE beam is being tested in cross-bending. Delicate micrometers are used to measure the stretch along the under side and the compression along the upper side.

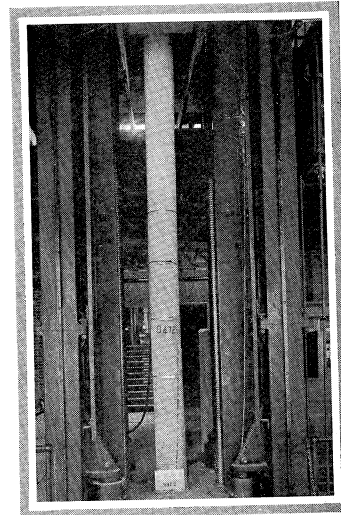


TEST OF A REINFORCED CONCRETE BEAM

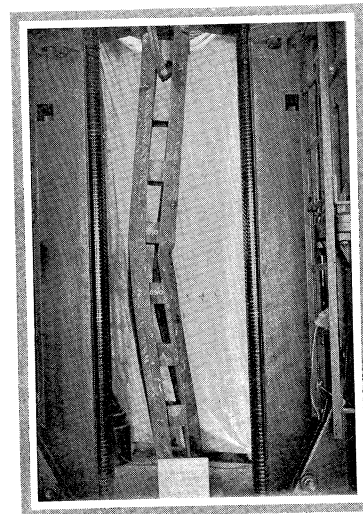
MATERIALS TESTING LABORATORY



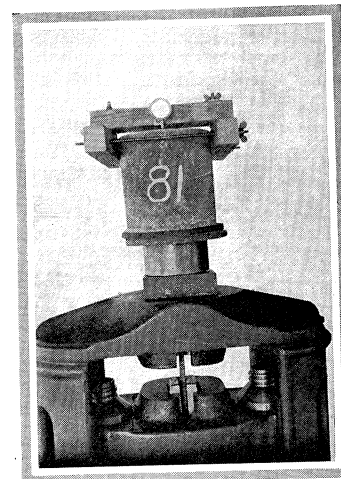
**REINFORCED CONCRETE COLUMN**  
 VIEW showing a concrete column with vertical steel rods after failure. The top of the column is covered with an iron plate imbedded in plaster of Paris to insure an even bearing. A load of 400,000 pounds produced failure.



**TEST OF A CONCRETE COLUMN**  
 THE column is 12 inches in diameter and 20 feet long, reinforced with spiral steel wire hooping. Its top is not visible. The testing machine has a capacity of 600,000 pounds and can be used for testing in either tension or compression.

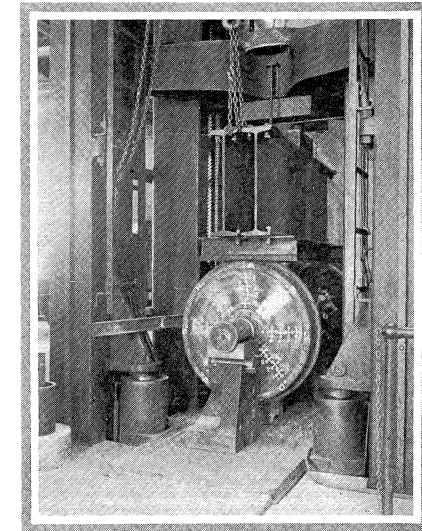


**TEST OF A STEEL COLUMN**  
 FAILURE of a built-up steel column made from angles and plates. This type of column is usually imbedded in concrete to give stiffness, and also for fire-proofing purposes.

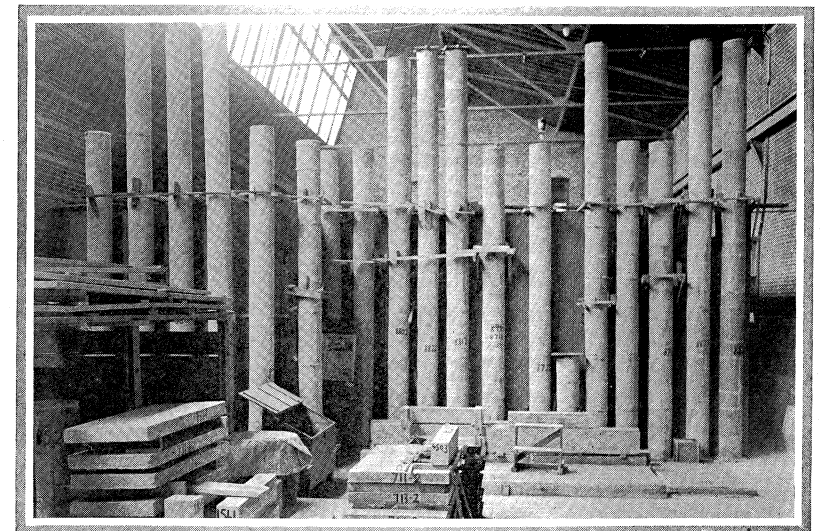


**TEST OF BOND BETWEEN CONCRETE AND STEEL**  
 THE bond is determined by measuring the force and the slip as the steel rod is pulled out of the concrete.

**MATERIALS TESTING LABORATORY**



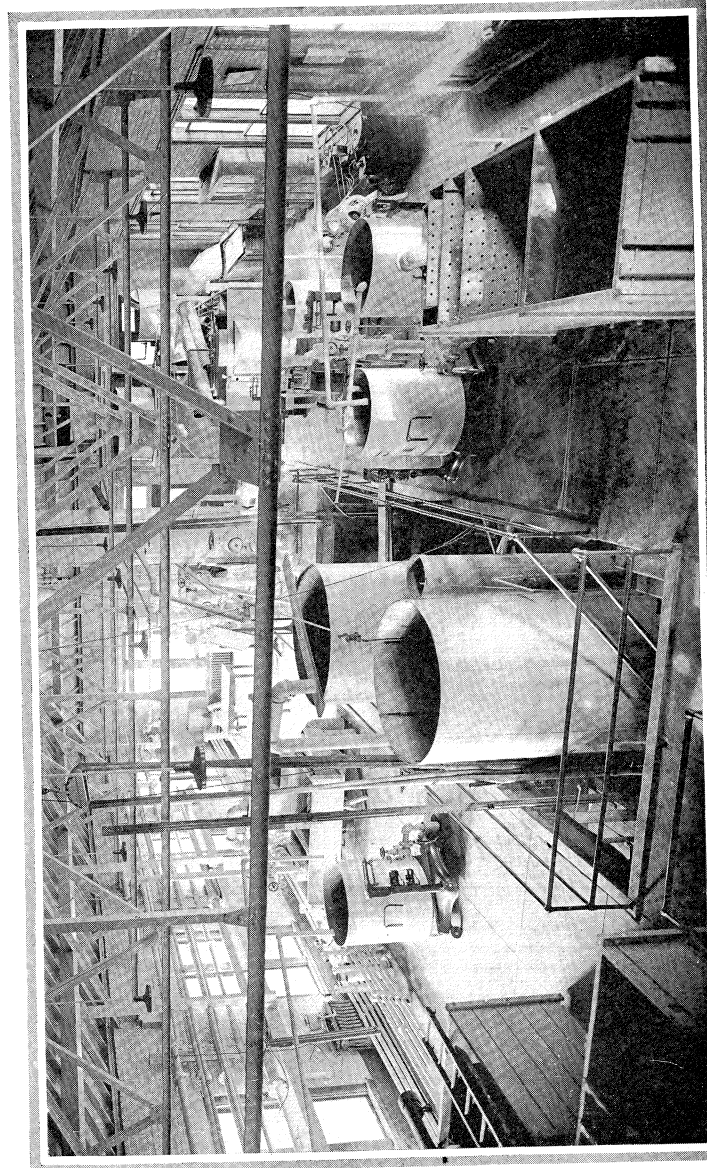
**TEST OF CAR WHEEL**  
 THE car wheels are mounted on an axle which is supported on pedestals resting on the weighing platform of the testing machine. The load is applied through steel beams and short pieces of rail bearing on the top of the wheels.



**CONCRETE TEST SPECIMENS**  
 A VIEW of the concrete laboratory where concrete and reinforced concrete specimens are made and cured. Concrete columns 12 inches in diameter and up to 20 feet long are shown in the rear and small beams and slabs in the foreground.

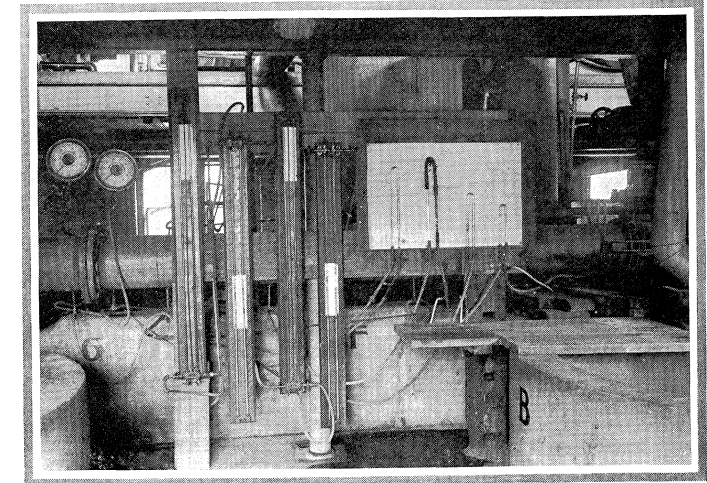
**MATERIALS TESTING LABORATORY**





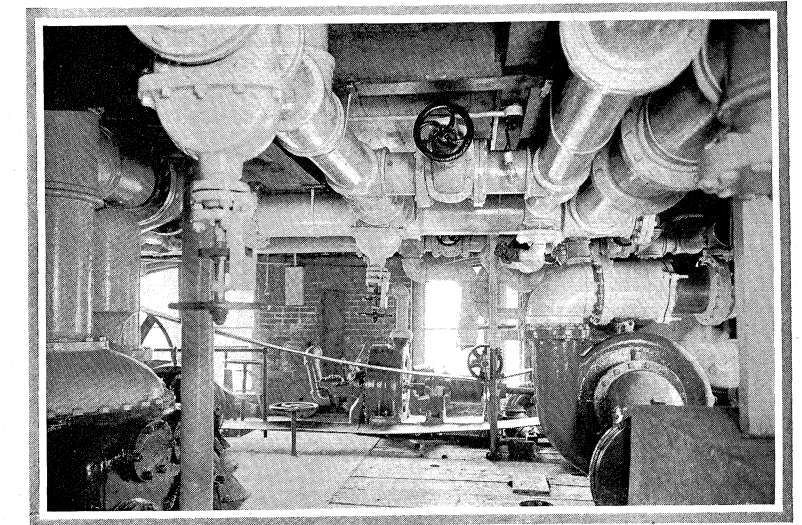
MAIN FLOOR OF HYDRAULICS LABORATORY

WATER under pressure is furnished from a stand pipe 60 feet high and 4 feet in diameter, which is shown at the rear of the laboratory. The equipment on this floor consists of tanks fitted with various pieces of apparatus for measuring the flow of water, small water motors, pumps, a small turbine water wheel, and several hundred feet of pipe of various sizes for experimental use. Apparatus for standardizing water meters is also installed in this laboratory.



MEASURING FLOW OF WATER IN A PIPE LINE

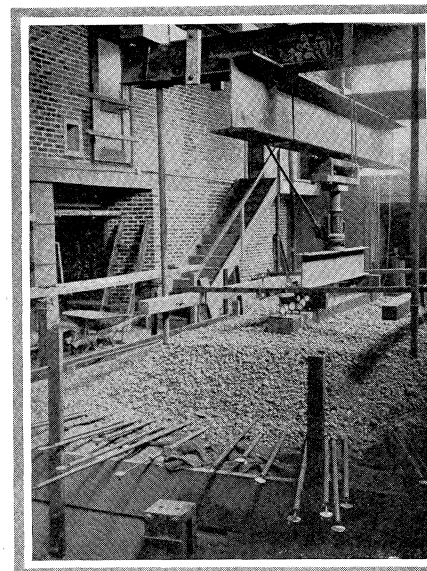
A THIN plate with a hole in it is clamped between the flanges of two pieces of pipe. The drop in pressure at the plate and the amount of water flowing per minute are measured. The orifice plate, as it is called, is thus made a meter for the amount of water flowing. In this experiment pressure gages are also used.



PUMP TESTING PLATFORM

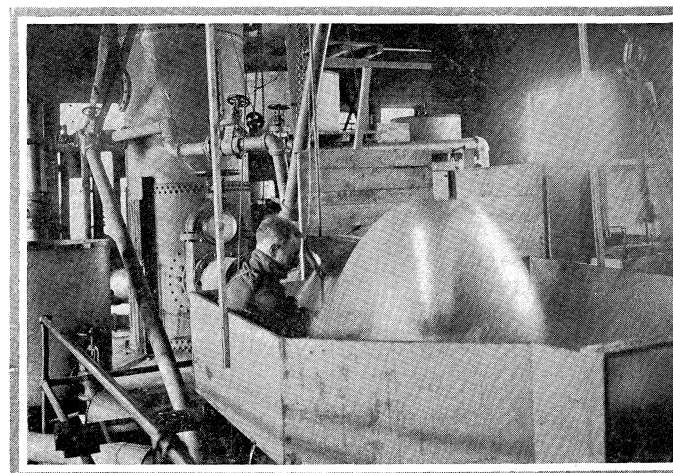
CENTRIFUGAL pumps up to 12 inches in size can be tested on this platform for capacity and power required for operation. The power to operate a pump under test is supplied by a 100 horse-power steam engine. Two centrifugal pumps can be seen in the picture.

MATERIALS TESTING AND HYDRAULICS WORK



TRANSMISSION OF PRESSURE THROUGH SAND AND GRAVEL

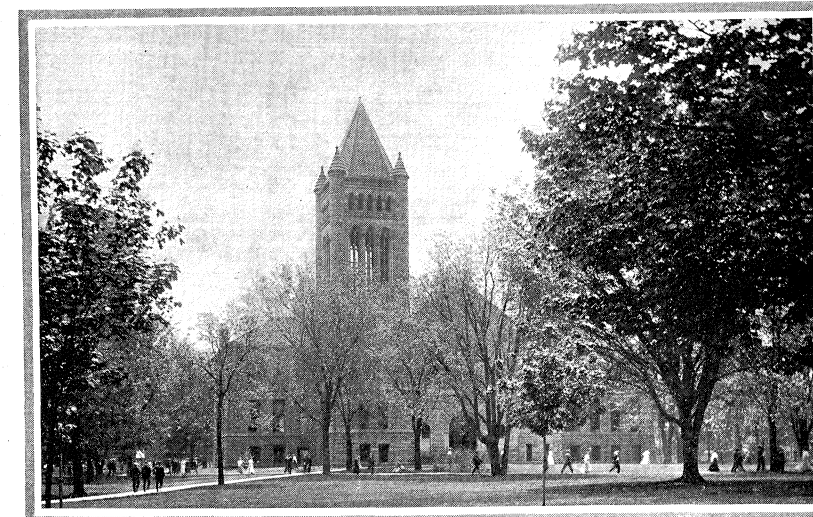
THE load is applied to the gravel bed through a railroad tie by means of a screw jack. At various points in the gravel bed small metal boxes are buried, and these are connected with the dials shown projecting from the gravel bed at various points. The pressures in the gravel bed are transmitted to these boxes, and are indicated by the dials.



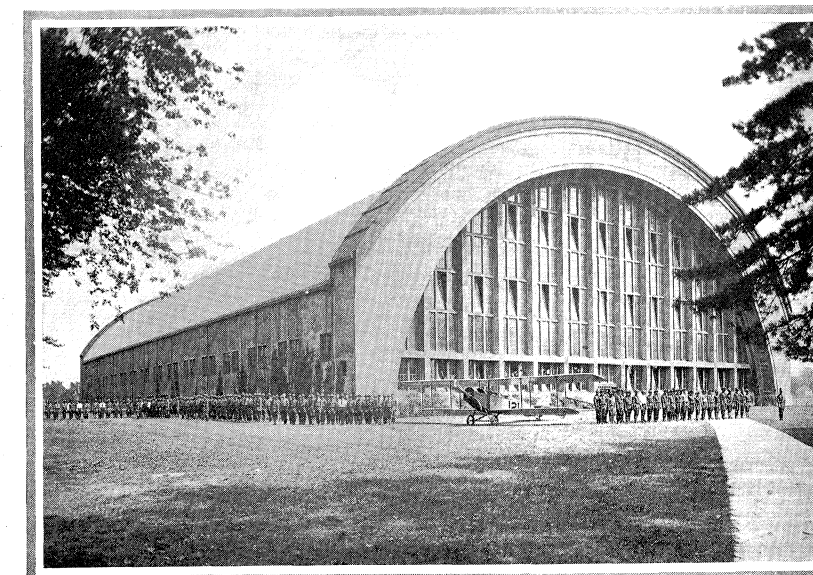
MEASURING FLOW OF WATER BY MEANS OF A VERTICAL JET

THE amount of water flowing through a pipe may be determined if it is allowed to discharge into the air in a vertical direction through a plate with a circular hole in it. The height to which the jet rises is a measure of the quantity of water passing.

MATERIALS TESTING AND HYDRAULICS WORK



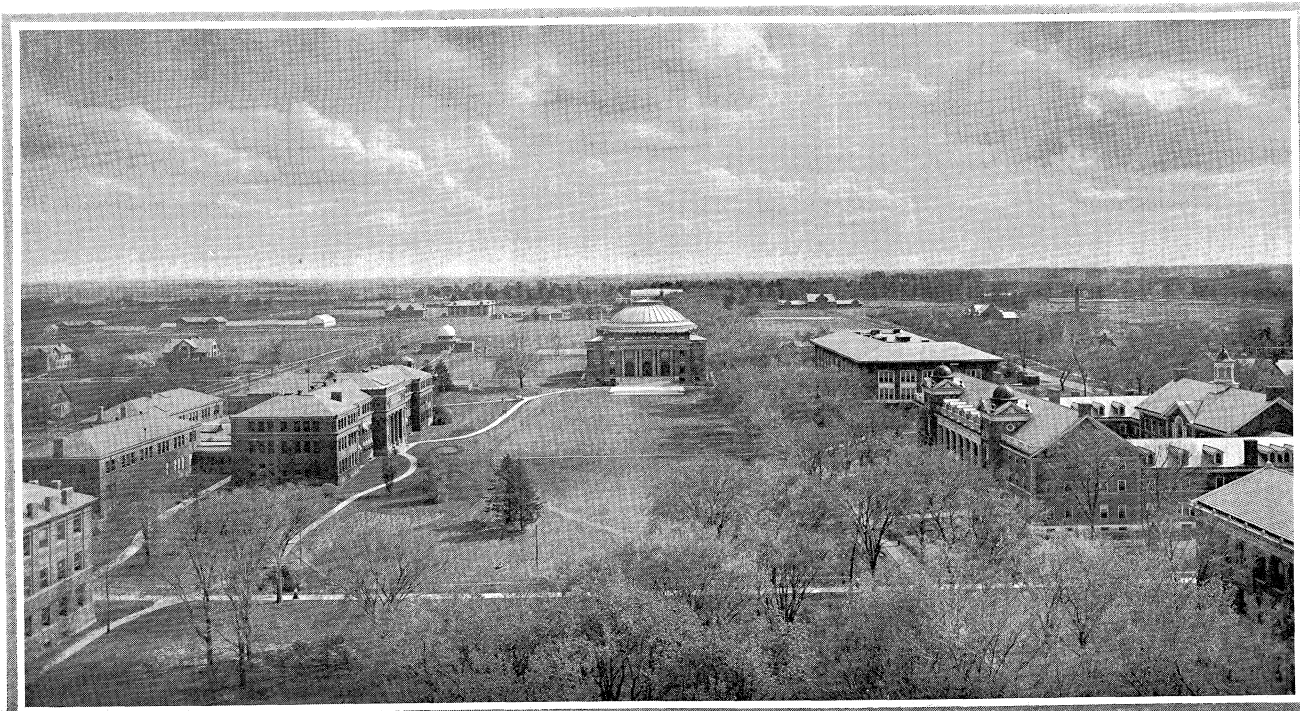
MAIN LIBRARY OF THE UNIVERSITY OF ILLINOIS



ARMORY USED FOR HOUSING EQUIPMENT  
AND FOR TRAINING QUARTERS FOR THE UNIVERSITY  
CADET CORPS

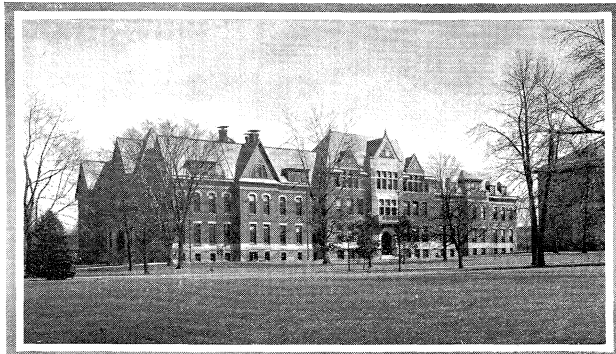
DURING the war this building was used by the United States Army; at first for training Aviators, and later for the Students' Army Training Corps.



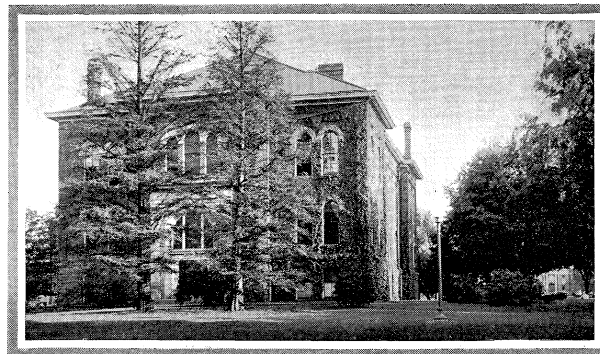


THE SOUTH CAMPUS OF THE UNIVERSITY OF ILLINOIS

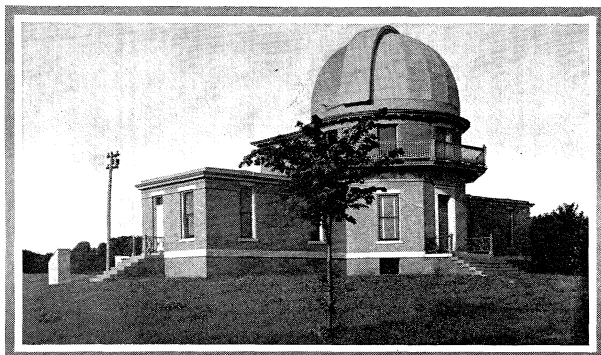
THE building shown near the center of the view is the Auditorium which seats over two thousand people.



NATURAL HISTORY BUILDING



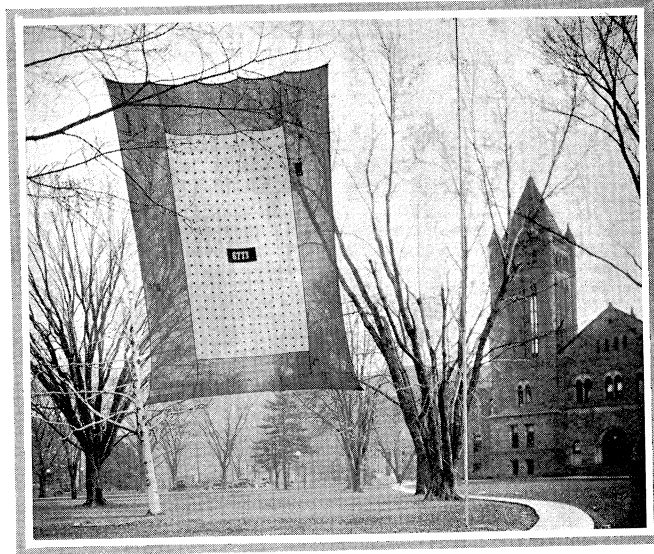
LAW BUILDING



ASTRONOMICAL OBSERVATORY



UNIVERSITY HALL



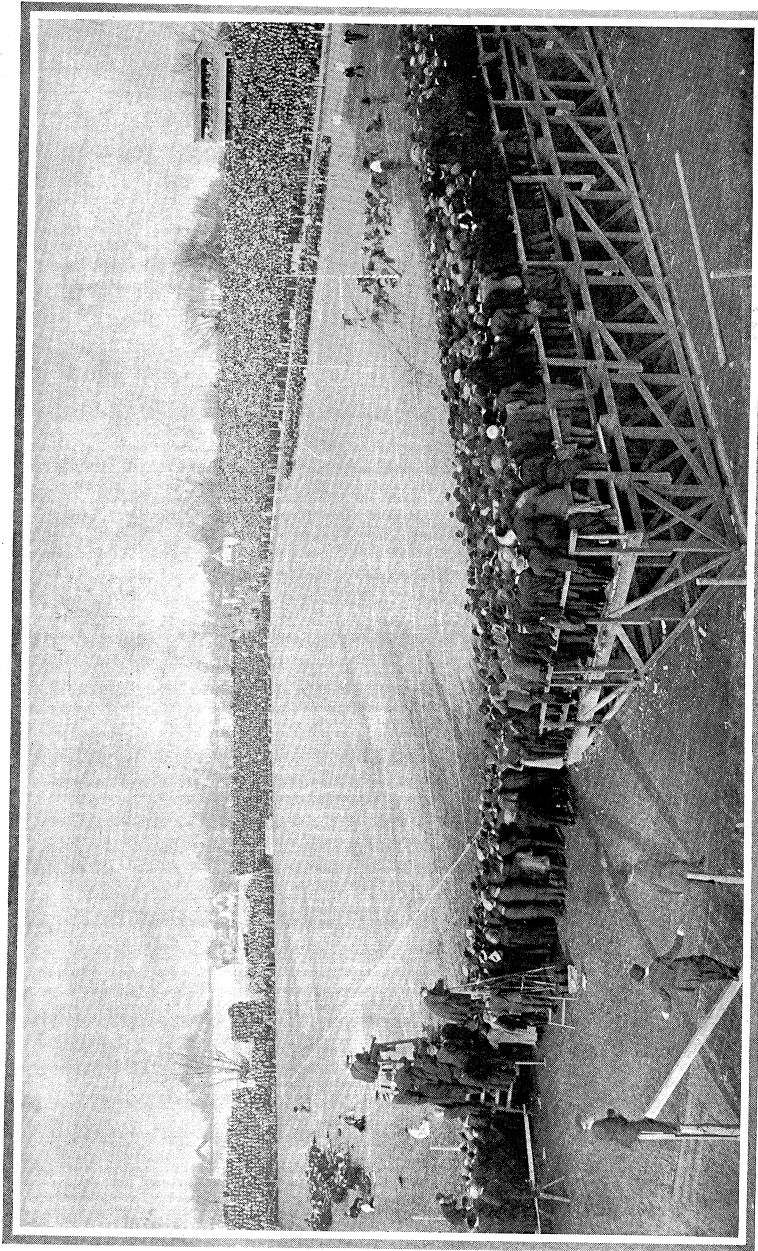
SERVICE FLAG OF THE UNIVERSITY

The picture was taken before the close of the war and the number on the flag representing students, graduates, and faculty does not give the total number who went into service.



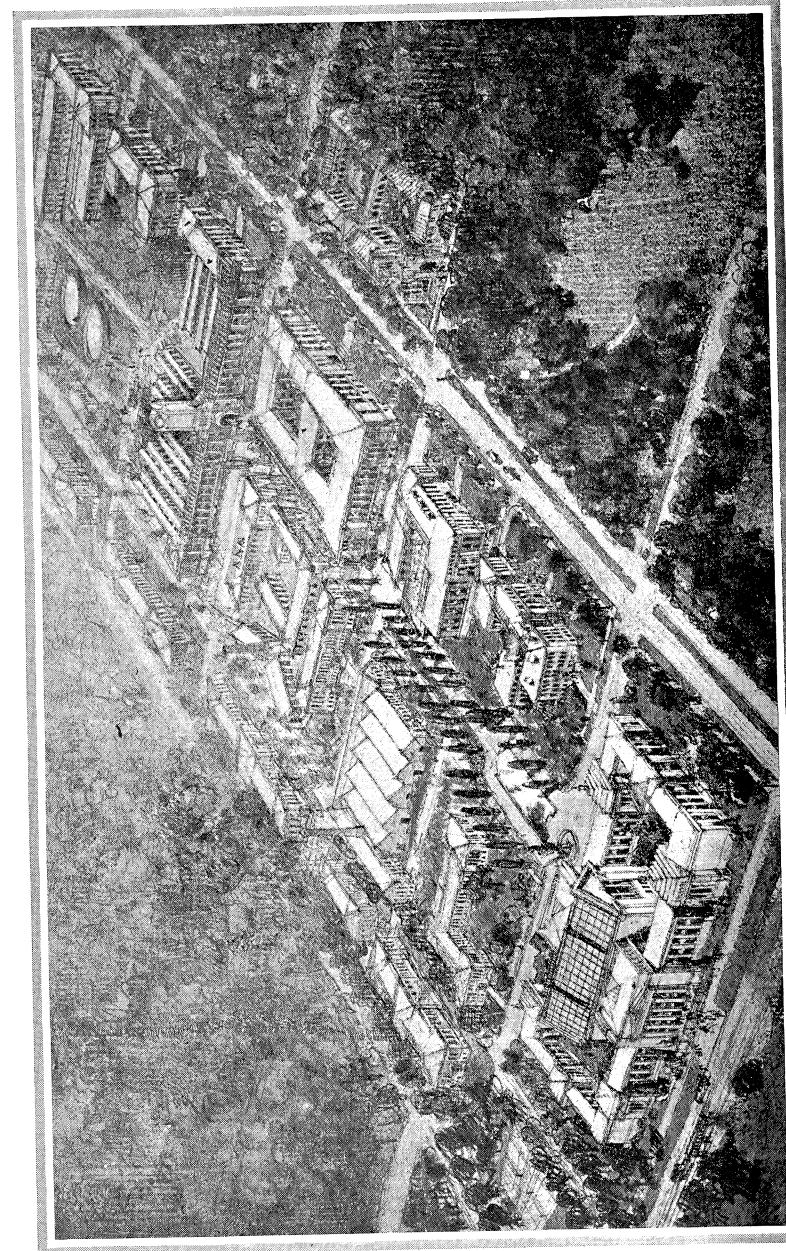
Y. M. C. A. QUARTERS OF THE UNIVERSITY OF ILLINOIS

This building was formerly occupied by the President of the University as his residence but during the war it was released to the Y. M. C. A. which in turn released its own building to the United States Government to be used as a barracks for Aviators in training.



VIEW OF THE FOOTBALL FIELD ON THE OCCASION OF ONE OF THE BIG GAMES





A STUDY FOR THE DEVELOPMENT OF THE CAMPUS OF THE COLLEGE OF  
ENGINEERING PREPARED BY THE STAFF OF THE DEPARTMENT OF ARCHITECTURE

THE UNIVERSITY OF ILLINOIS

THE STATE UNIVERSITY

Urbana

EDMUND J. JAMES, Ph.D., LL.D., President

THE UNIVERSITY INCLUDES THE FOLLOWING DEPARTMENTS:

The Graduate School

The College of Liberal Arts and Sciences (Ancient and Modern Languages and Literatures; History, Economics, Political Science, Sociology; Philosophy, Psychology, Education; Mathematics; Astronomy; Geology; Physics; Chemistry; Botany, Zoology, Entomology; Physiology; Art and Design)

The College of Commerce and Business Administration (General Business, Banking, Insurance, Accountancy, Railway Administration, Foreign Commerce; Courses for Commercial Teachers and Commercial and Civic Secretaries)

The College of Engineering (Architecture; Architectural, Ceramic, Civil, Electrical, Mechanical, Mining, Municipal and Sanitary, and Railway Engineering)

The College of Agriculture (Agronomy; Animal Husbandry; Dairy Husbandry; Horticulture and Landscape Gardening; Agricultural Extension; Teachers' Course; Household Science)

The College of Law (three years' course)

The School of Education

The Course in Journalism

The Courses in Chemistry and Chemical Engineering

The School of Railway Engineering and Administration

The School of Music (four years' course)

The School of Library Science (two years' course)

The College of Medicine (in Chicago)

The College of Dentistry (in Chicago)

The School of Pharmacy (in Chicago; Ph. G. and Ph. C. courses)

The Summer Session (eight weeks)

Experiment Stations and Scientific Bureaus: U. S. Agricultural Experiment Station; Engineering Experiment Station; State Laboratory of Natural History; State Entomologist's Office; Biological Experiment Station on Illinois River; State Water Survey; State Geological Survey; U. S. Bureau of Mines Experiment Station.

The library collections contain (November 1, 1918) 437,949 volumes and 108,289 pamphlets.

For catalogs and information address

THE REGISTRAR  
URBANA, ILLINOIS