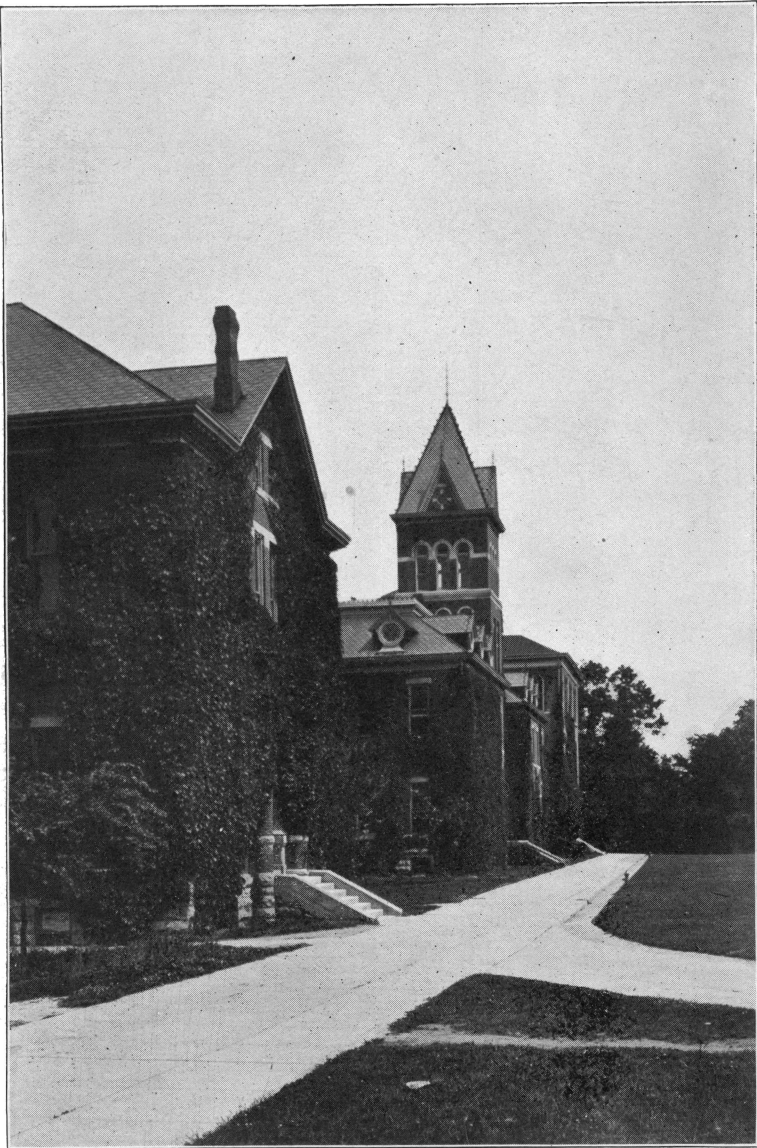


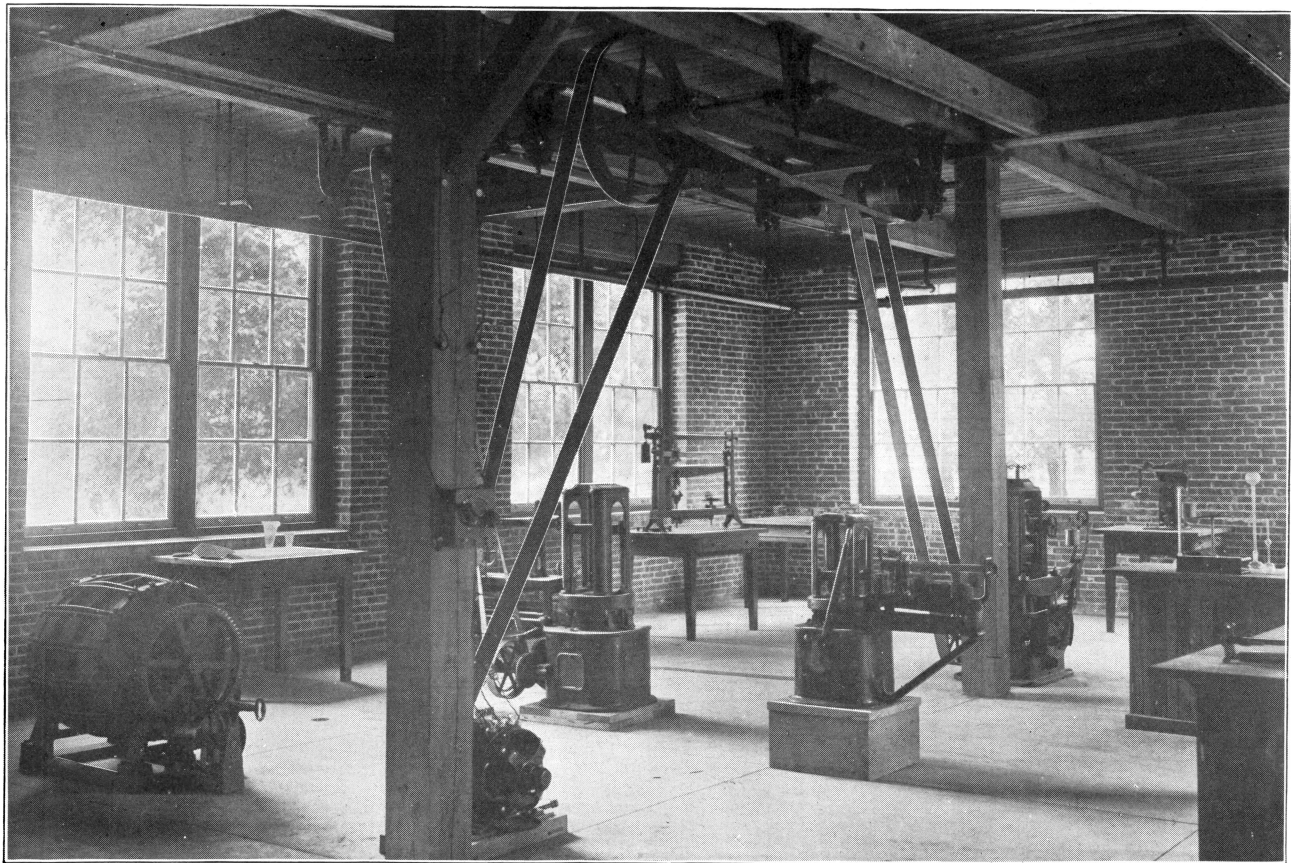
**SCHOOL OF ENGINEERING**



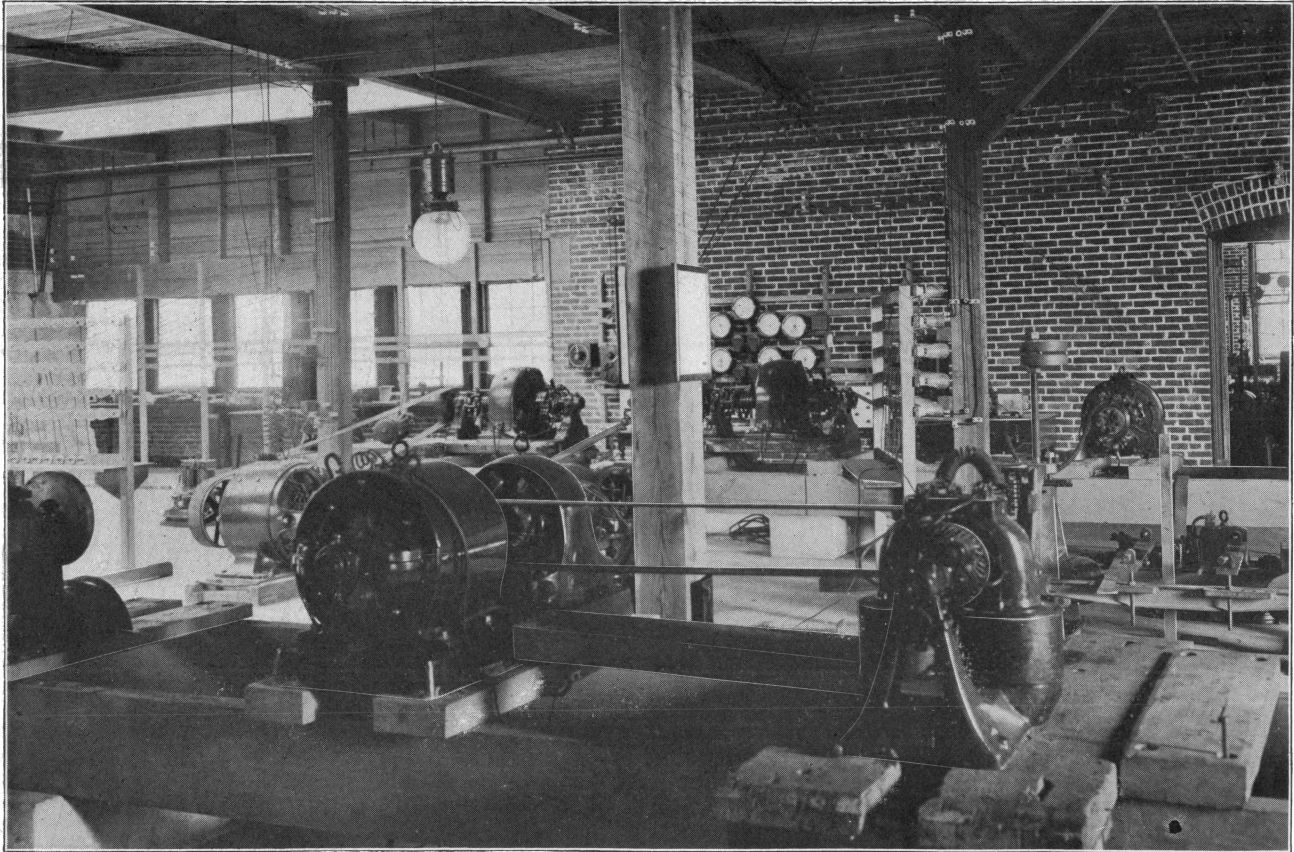
Mechanic Arts

Engineering

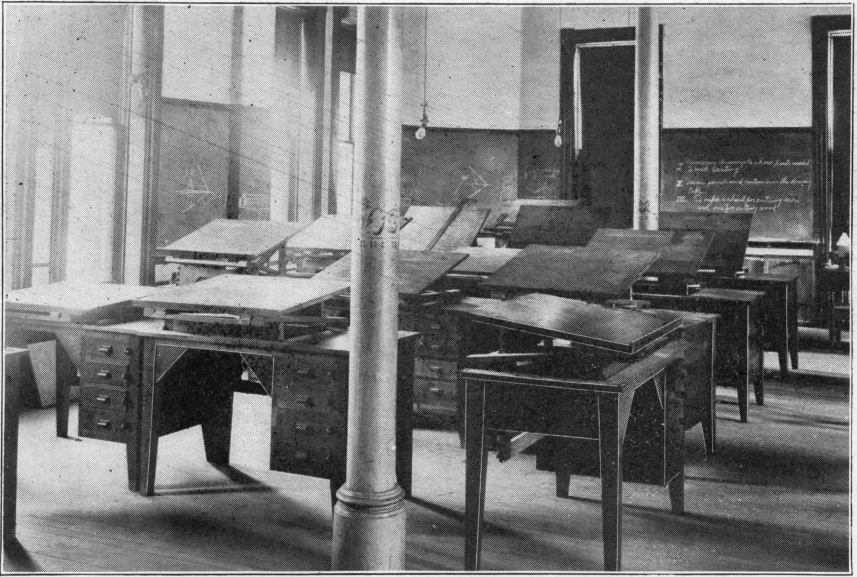
**THE WEST SIDE OF THE CAMPUS—LOOKING NORTH**



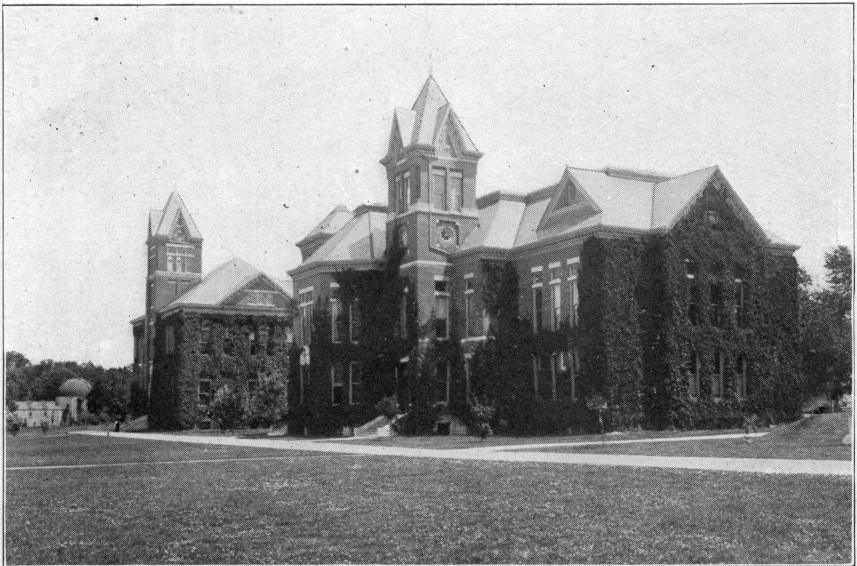
CIVIL ENGINEERING LABORATORY



ELECTRICAL ENGINEERING LABORATORY



CORNER OF ONE OF THE DRAWING ROOMS



Observatory  
(Geodetic Surveying)

CHEMISTRY BUILDING

Chemistry

# BULLETIN OF THE UNIVERSITY OF MISSOURI.

VOL. IV.

AUGUST, 1903.

NO. 8.

## SCHOOL OF ENGINEERING.

### Historical Statement.

The University of Missouri was founded in 1840. The Department of Education was founded in 1867; that of Law, in 1872; and that of Medicine in 1873. The College of Agriculture and Mechanic Arts was established at Columbia, and the School of Mines at Rolla, in 1870. In 1877, a chair of Civil Engineering was established in the College of Agriculture and Mechanic Arts, and, later were added chairs of Electrical and Mechanical Engineering. Columbia, a beautiful city of 7,000 inhabitants, about midway between St. Louis and Kansas City, is on the Wabash and the Missouri, Kansas, and Texas Railroads.

### Resources.

Our buildings, grounds, books, and other equipment, are valued at more than \$1,550,000, not including the campus or the grounds for Botany, Horticulture, and Agriculture. The endowment (interest at 5 or 6 per cent) is \$1,236,000. The income from the United States Government (Hatch and Morrill Acts) is \$38,150 a year. Moreover, the Legislature makes appropriations biennially. There is some income from fees for libraries and laboratories. There are 47,427 acres of unsold land. A State Collateral Inheritance Tax yields about \$120,000 a year. The income of the whole University, from all sources and for all departments, in each of the calendar years 1901 and 1902, was about \$425,000. It will not be less in 1903-4.

### Expenses. Free Tuition.

Tuition is free in all Departments—Graduate, Academic, Department of Education, Medicine, College of Agriculture, Engineering, School of Mines. In all these Departments, except Law and Medicine, the only charges are a library fee of \$5 a session and small laboratory deposits covering the cost of materials used by the students. In Medicine the only charge is a library fee of \$10 a year and small laboratory deposits. In Law, the only charge is a library fee of \$10 a year. The expenses for room, board, books, and fees vary. For Engineering students who board in our club houses these expen-

ses need not exceed \$140, nor more than \$200 a year for those who board in private families. The fees in some Colleges and Universities will bear all expenses here.

**Buildings.** Engineering Hall, Engineering Laboratory, Power-house, Mechanic Arts Hall, Observatory, Chemical Laboratory, Laboratory of Geology and Zoology, Academic Hall, Agricultural Hall, Dairy Laboratory, Live Stock Laboratory, Agricultural Barns, Laboratory of Horticulture Entomology and Botany, Greenhouse, Law Building, Medical Laboratory, Hospital, three Dormitories, President's House. Our School of Mines has seven buildings. Next year we may expend about \$200,000 for new buildings, including a separate Laboratory for Physics, a Gymnasium, and a Hospital for Animals.

**Laboratories.** There are at Columbia many laboratories of science and technology, seven rooms for drawing and designing, and several shops. The School of Mines has several laboratories and drawing rooms and shops. Of the \$252,000 expended for new buildings in 1902, \$154,000 went for laboratory buildings. Nearly \$60,000 more were spent for their better equipment with apparatus. Thus about \$214,000 were invested last year in better facilities for our laboratory work.

**Libraries.** We have a library for general readers and several department libraries for professors and advanced students. These libraries contain nearly 60,000 bound volumes. Moreover, the collections of the State Historical Society, 21,000 volumes, in Academic Hall, are accessible to our students.

**Faculties.** Our faculties contain, all told, more than 120 teachers. Twelve Professors, Assistant Professors, and Instructors give their entire time to mechanical drawing, shop work, civil, electrical, and mechanical engineering.

**Enrollment.** The students of the University come from almost every county in Missouri. Fifty-six states, territories, and foreign countries were represented here during the session of 1902-1903 by 1591 students. The enrollment at Columbia in Engineering has increased in five years from 66 to 230.

**Requirements for Entrance.** A good high school education, or its equivalent, and evidence of good character are demanded for admission to any department.

**Religious Influences.** Almost all denominations are represented at Columbia. The city is notable for its churches. The University has a zealous chapter of the Young Men's Christian Association, and one of the Young Women's Christian Association. There is a students' prayer meeting every week. Prayers by officers of the University also are held every morning. Attendance upon religious exercises is voluntary. A large number of students voluntarily attend courses of Bible study.

**Debates and Athletic Sports.** Our students have teams for foot ball, base ball, basket ball, track athletics, and lawn tennis. There is a gymnasium for men and another for women. The athletic field and the golf links are excellent. Much success has attended our contestants in inter-collegiate debates. There are fourteen literary and scientific societies among the students, including a flourishing "Engineers' Club."

**Courses and Degrees.** Instruction is given in Civil, Electrical, Mechanical, Sanitary, Hydraulic, and Chemical Engineering. The degrees of Bachelor of Science in Civil, Electrical, Mechanical, and Chemical Engineering, and the graduate degrees of Civil, Electrical, and Mechanical Engineer are conferred.

**Civil Engineering.** Three courses are given: one in Civil Engineering, leading to broad, general training; a course in Sanitary Engineering, with less attention to structural and railway work and more to sanitary subjects; a course in Hydraulic Engineering, giving special attention to hydraulic and irrigation problems. The surveying instruments are new. They include 13 transits, 9 levels, 2 plane tables, 4 compasses, sextant, tapes, and small instruments, and for precise work, an 8-inch Fauth Theodolite, Brandis triangulation transit, precise level, base apparatus, etc. The laboratory has a brick abrasion machine, 2 torsion machines, 3 testing machines for tension and compression, Olsen and Fairbanks cement machines, briquette press and mixer, boilers for steam tests, Vicat and Gilmore needles, etc. For office work there are rolling and polar planimeters, a pantagraph, topographical protractors, stadia charts and slide rule, Thatcher calculating instrument, beam compass, etc. About 500 drawings of recent bridges, presented by Mr. T. J. Wilkerson (class of 1890) of Pittsburg, and a set of 130 drawings, carefully arranged, indexed, and presented by Mr. J. A. L. Waddell, illustrating recent practice in bridge design, are available for instruction.

**Electrical Engineering.** This course is arranged to give fundamental training in Electrical Engineering, with as much as possible of the practical applications. Thoroughness in English, Chemistry, Physics, and Mathematics is insisted upon. The strictly technical studies include Electrical Measurements, Electrical Machinery, Alternating Currents, Electrical Design, Transmission and Distribution, besides Surveying and studies in Mechanical Engineering. A branch section of the American Institute of Electrical Engineers has been established and discussion of current literature is a feature of the training. The equipment consists of some 30 dynamos for laboratory work in direct and alternating currents, including two double-current generators, which are used for a great variety of tests; of apparatus for standardizing instruments, and for electrical testing; and of storage batteries, ammeters, voltmeters, wattmeters, tachometers, resistances, lamp banks, etc.

**Mechanical Engineering.** This course prepares for any of the branches of Mechanical Engineering, giving a thorough foundation in the general principles and developing several important divisions. The study of engineering materials is applied to the designing of structures and machinery. The theory of machines is taught as well as the practical operation, in connection with the development, transference, and use of power. These principles are tested in the laboratory, which is equipped with various types of compound and simple engines, a two-stage-duplex air compressor, compound duplex steam pump, steam pumps, power pumps, pulsometers, injectors, condensers, steam turbine, gas, oil, and hot-air engines, water wheels, and the necessary meters, gauges, weirs, and tanks. The work in the laboratory is done by the students, who make all arrangements and tests of apparatus. The problems in laboratory and class room are taken from practice.

**Mechanics.** A department has been established for work in theoretical and applied Mechanics, formerly given by the Professor of Mechanical Engineering.

**Drawing.** Instruction is given in Mechanical Drawing, Descriptive Geometry, Lettering, and Machine Drawing. All engineering students are taught practical draughting room methods as well as the making of accurate and comprehensive drawings.

**Shops.** The joinery, forge, pattern, and machine shops contain 1600 square feet of floor space each, and accommodate sections of twenty-four students. The machine shop is equipped with engine-lathes, shapers, power saws, drill presses, planers, grinder, milling and screw machines. The underlying principles of production and erection are taught and also the limitations of materials and machines.

**Other Departments.** All courses in the University at Columbia, including the Academic and other departments, are open to engineering students, with the consent of the Dean.

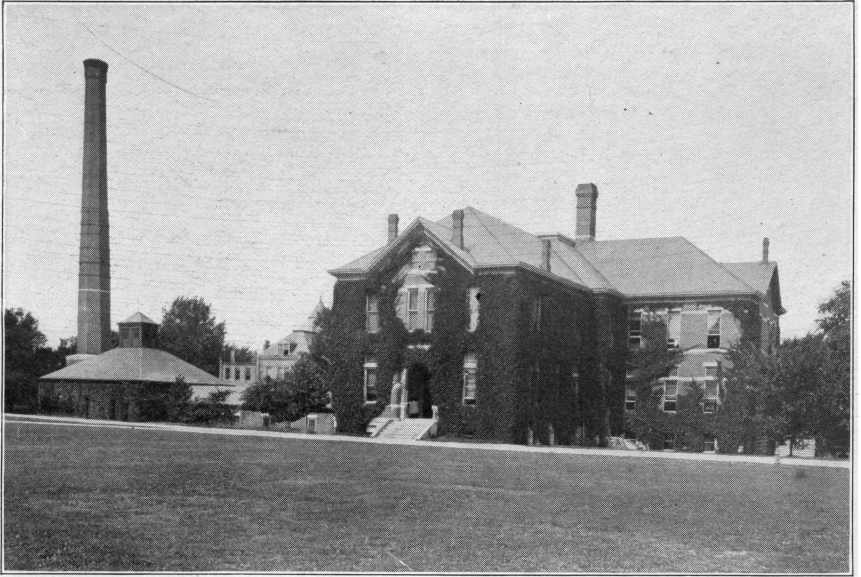
**Opportunities in Missouri.** Missouri contains 69,415 square miles—nearly 3,000 more than New England. The population is 3,106,665. While the development of its resources has scarcely begun, Missouri is the fifth state in the Union in population, in wealth, and in agriculture, and the seventh in manufactures. For mining it is justly famous. It is a land of opportunity for enterprising young men. The best introduction to any state is through its university.

**Catalogue.** If this circular interests you, write for a catalogue of the whole University or of any Department. If, thinking seriously of attending this University, you wish to see plates illustrating its buildings, these too will be sent you. Address the Registrar, Mr. Irvin Switzler, Columbia, Missouri.

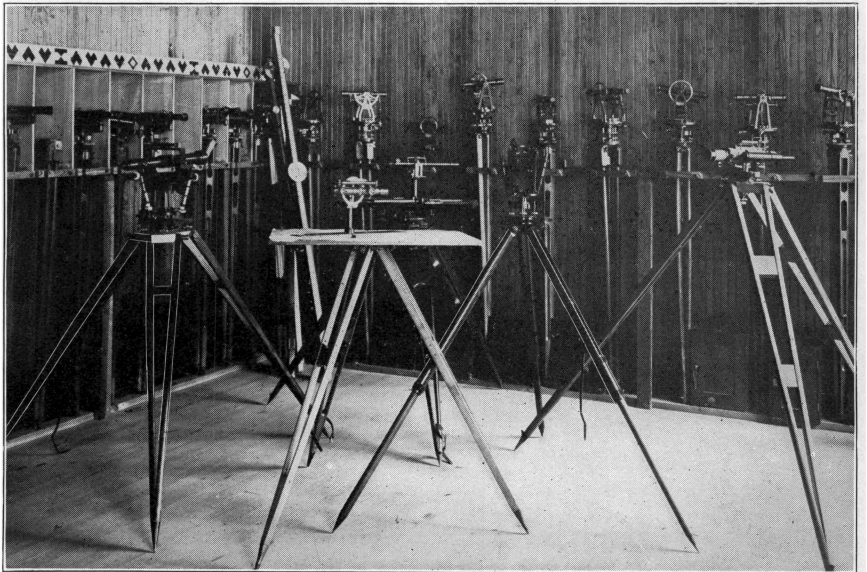
F. B. MUMFORD,  
Acting Dean.

1 August, 1903.

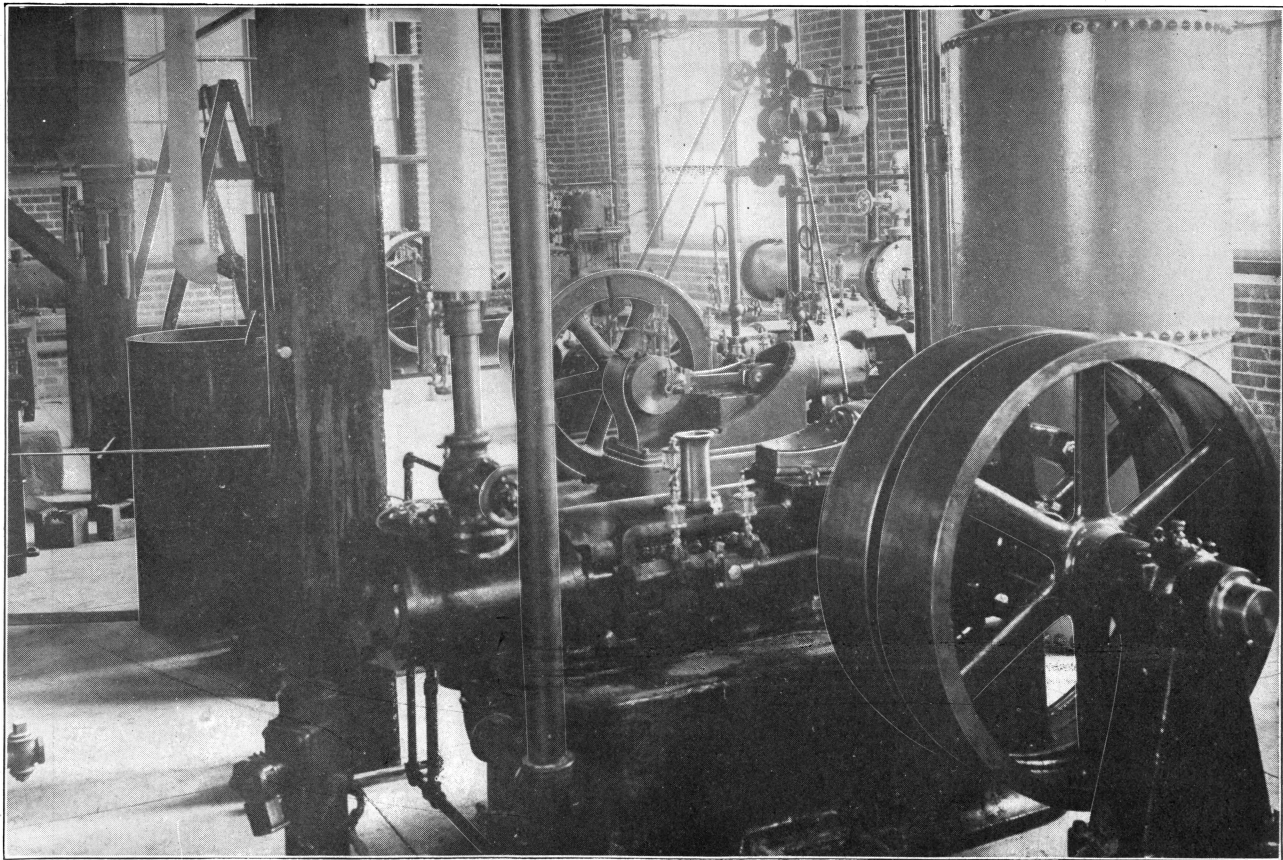




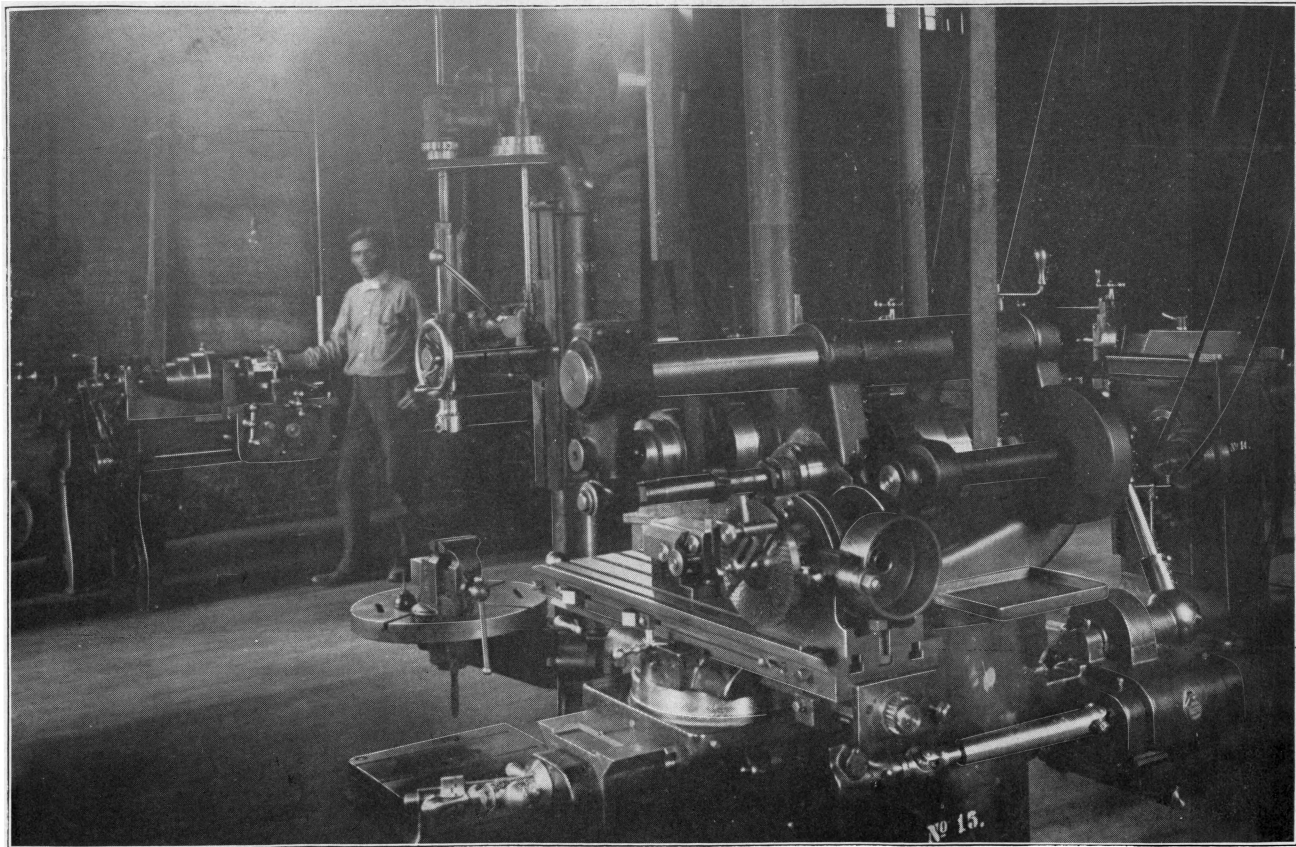
MECHANIC ARTS BUILDING AND POWER HOUSE



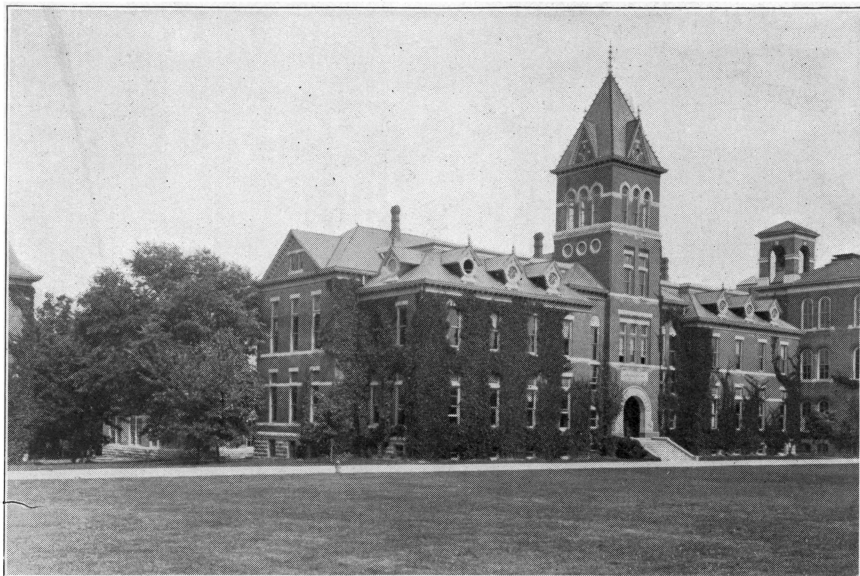
SURVEYING INSTRUMENTS



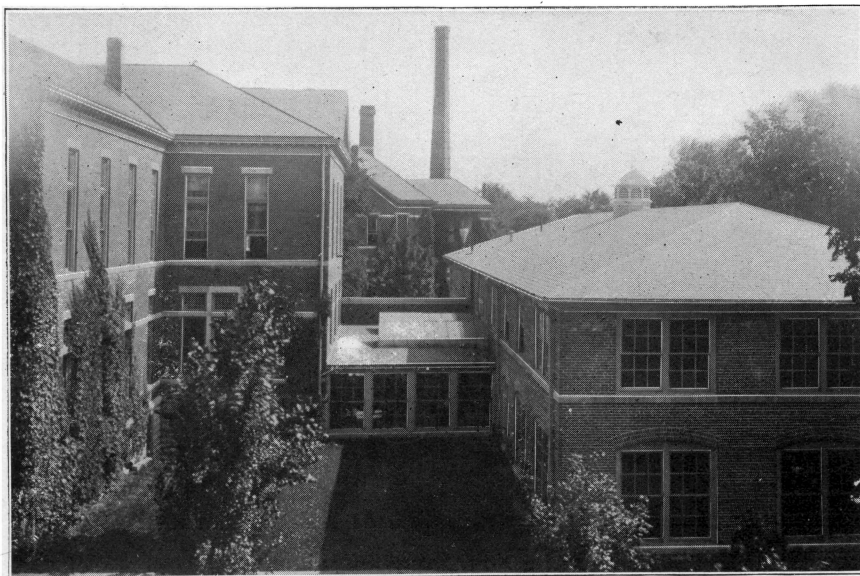
MECHANICAL ENGINEERING LABORATORY



MACHINE SHOP



ENGINEERING HALL



ENGINEERING LABORATORY

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