PURDUE UNIVERSITY, LA FAYETTE, INDIANA.

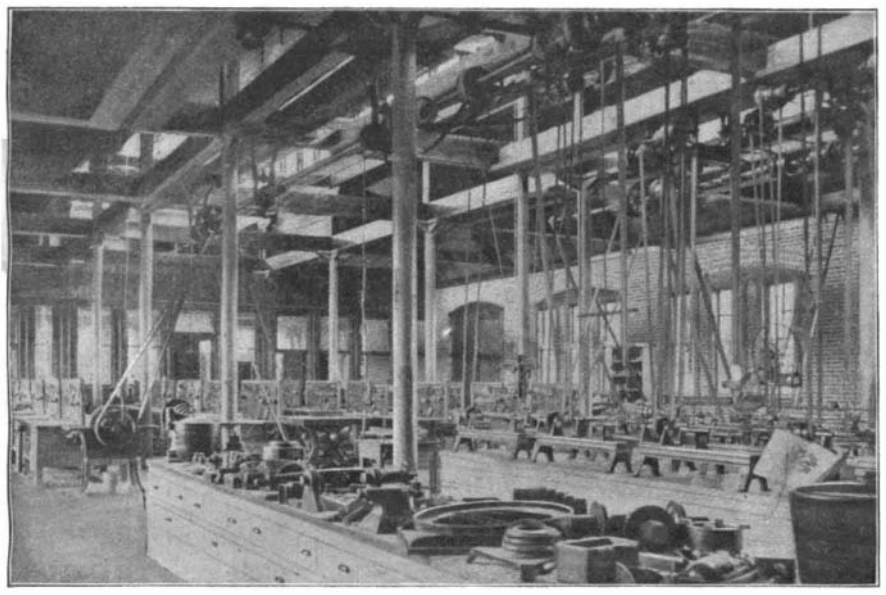
One of the most interesting and, at the same time, one of the most important problems of the last quarter of a century has been that concerning the nature of the work to be done in the higher educational institutions. The value of that system which had been pursued in colleges for centuries began to be seriously questioned, and out of this questioning grew the conclusions that institutions were needed differing radically in ultimate purpose as well as in curricula from those already existing. Out of this belief arose the various schools of technology which have been such an important factor in the educational progress of this generation.

The establishment of such institutions led to problems of extreme intricacy, and the various solutions of these problems rendered the work of these schools, for many years, largely experimental and tentative. From the results of these experiments, however, we have the technical school of to-day, which, with its magnificently equipped laboratories and its faculty of specialists, is each year making possible new applications of science, to new industries, and to new problems of everyday life.

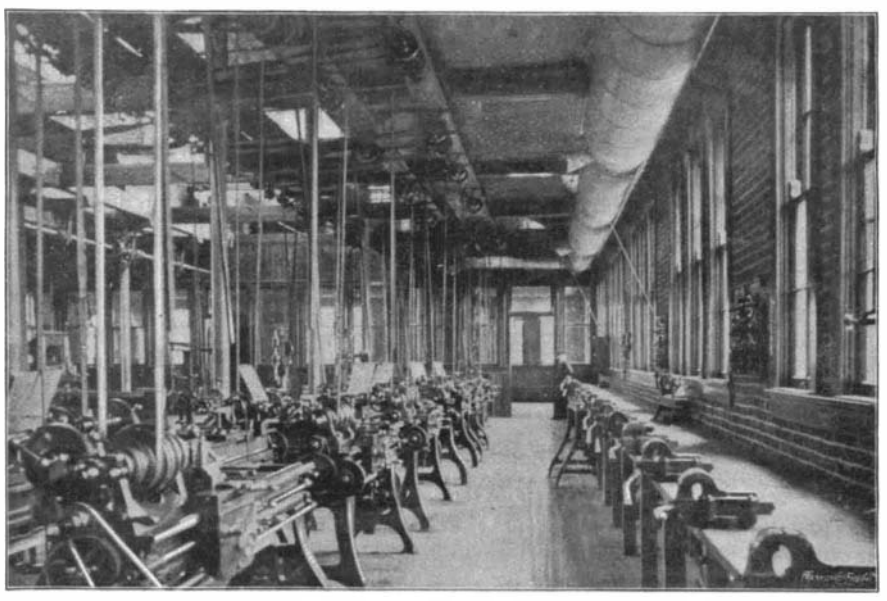
In the central States the growth and development of technical schools within the past decade has been marvelous. These schools have been able to utilize the experience of older institutions, and, by avoiding the errors of the earlier experimental years, have reached in a very short time the highest degree of efficiency. Recognizing the importance of the work of such schools we give in this issue a description of Purdue University, at La Fayette, Indiana, which stands perhaps as the most prominent type of such schools in the West.

A visitor at Purdue cannot fail to be impressed with the number and excellence of its laboratories. In the department of science are laboratories for chemistry, biology, geology, physics and art; the agricultural department boasts of a fine agricultural experiment station; and the engineering department possesses unusual facilities for laboratory practice in mechanical, electrical and civil engineering. Some of the engineering laboratories have already been described and illustrated in these columns* and others constitute the subject of the present article.

Two years ago there was erected a large building for the accommodation of the engineering departments. A few days after its dedication this building, with its acre and a half floor space and its elaborate equipment, altogether representing an investment of nearly $200,000, was swept away by fire. The loss was severe, but through the wise administration of Purdue's energetic president, Dr. James H. Smart, it has been made the basis of a new development. A large amount of new apparatus and machinery was soon running in temporary quarters. The wood room, foundry, forge room, machine room, the engineering laboratory, and the new annex laboratory for locomotive testing, were all in complete order before the beginning of the present school year, less than seven months after the fire.



ENGINEERING LABORATORY—THE WOOD ROOM.



ENGINEERING LABORATORY—THE MACHINE ROOM.

The construction of the front portion of the building, including the tower, is now going on, and the whole building will be entirely completed by the first of next October. A view of this building from a photograph before the fire is given on our first page.

The incidental gain which has been brought about by the fire is to be found in the improved character of the equipment. The machinery is new, its arrangement is improved and the amount of apparatus in all departments has been greatly increased.

The apparatus for work in steam engineering consists largely of typical engines. Each experimental engine has its full complement of accessory apparatus for determining the performance of the machine. Altogether there are in the laboratory 36 steam cylinders, aggregating about 1,500 horse power; six friction brakes, which together are capable of absorbing 1,000 horse power; and six surface condensers.

Among the important experimental steam plants may be mentioned a large triple expansion Corliss engine, a Buckeye engine, a straight line engine, two Atlas engines, a Westinghouse compound engine, a pair of Baldwin compound locomotive engines, a De Laval steam turbine and a locomotive testing plant.

The locomotive testing plant occupies an annex laboratory and consists of an ordinary locomotive mounted in such a way as to allow its action to be studied and its performance tested while the engine is run at any desired speed and under any load, the conditions being similar to those of the track. The locomotive has 17 by 24 inch cylinders and weighs 85,000 pounds. When in use, it is fired and its motion controlled precisely as if it were upon the road, and while thus run its performance may be tested with the same accuracy which attends the testing of any stationary plant. All parts of the mount are adjustable to suit the dimensions of any locomotive whatsoever. Purdue's engine may be readily run out of the laboratory and any locomotive from any part of the country may take its place. It is expected that from time to time different locomotives will be available for the use of students.

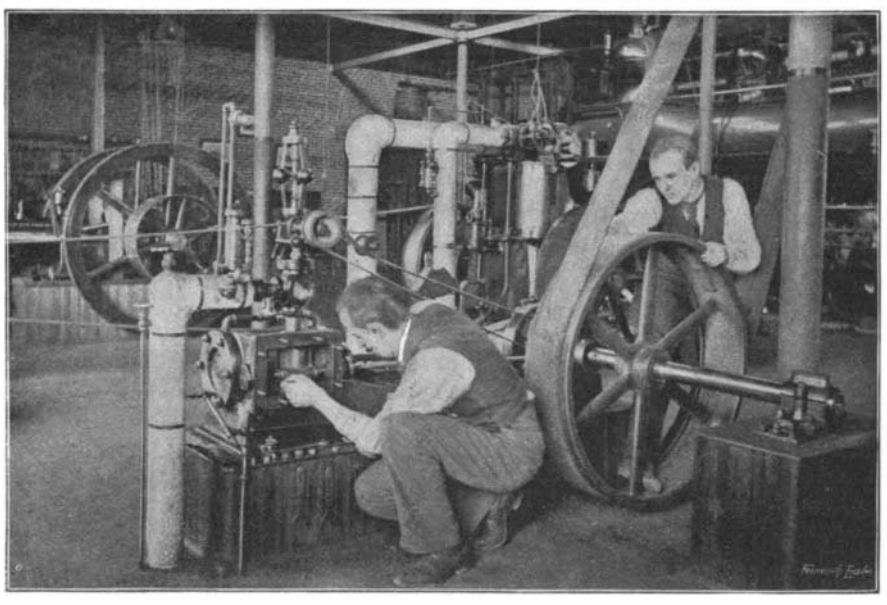
For determining the strength and other physical properties of constructive materials, the laboratory has three large machines, one of which is of 300,000 pounds capacity and of a size sufficient to allow tensional and compressional tests to be made on specimens 8 feet in length.

The several pumps, motors and other machinery making up the equipment for work in hydraulics are grouped about an experimental stand pipe. The pumps draw their supply from a low-level cistern and deliver to the stand pipe. Water from the stand pipe may be used to supply hydraulic apparatus, or it may be discharged directly into an iron weir tank, from which it flows to the low-level cistern. The combined capacity of the several experimental pumps is about 1,000 gallons per minute.

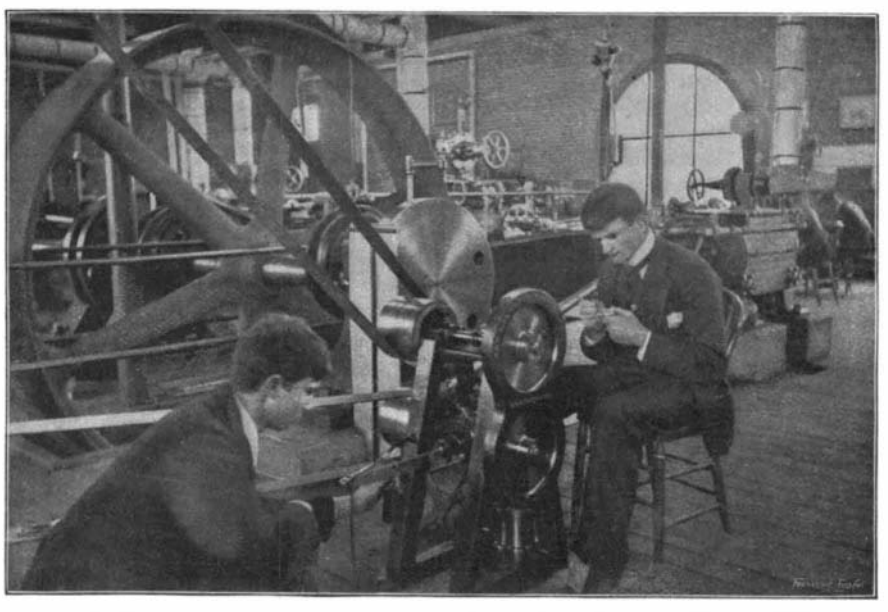
The laboratories of the electrical department occupy a building by themselves. The dynamo laboratory contains over twenty dynamos and motors of different types and outputs, aggregating over 200 horse power. For direct current working, there are both incandescent and arc dynamos and motors of different voltages. For alternate current working, there are alternators and multiphase machines of different outputs and a large equipment of transformers of nearly every American type.

The circuits from all machines, instruments and pieces of apparatus throughout the pier rooms and laboratories of the electrical building can be connected to a large switchboard providing 400 terminals. By this means, any desired combination of machinery, apparatus and instruments may be readily secured.

The equipment of the civil engineering department affords the student abundant opportunity for making himself familiar, by actual use, with the excellent assortment of surveying instruments, embracing those usually employed in actual work, as well as those used in geodetic and astronomical observations.



ENGINEERING LABORATORY—VALVE SETTING.



ENGINEERING LABORATORY—PRACTICE WITH TRANSMISSION DYNAMOMETER.

In connection with the work in civil engineering, courses are offered in architecture and in sanitary engineering.

A GOLD medal of the value of $200 is offered by the Bologna Academy of Sciences for the memoir describing the best system or apparatus for putting out fires by chemical, physical or mechanical means. The papers must all be in by the end of May, 1896, and may be written in Latin, French, or Italian, or in any other language if accompanied by an Italian translation.

* May 14, 1892.

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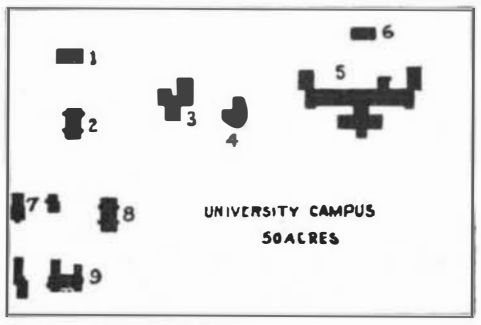
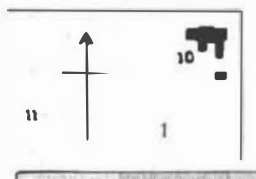
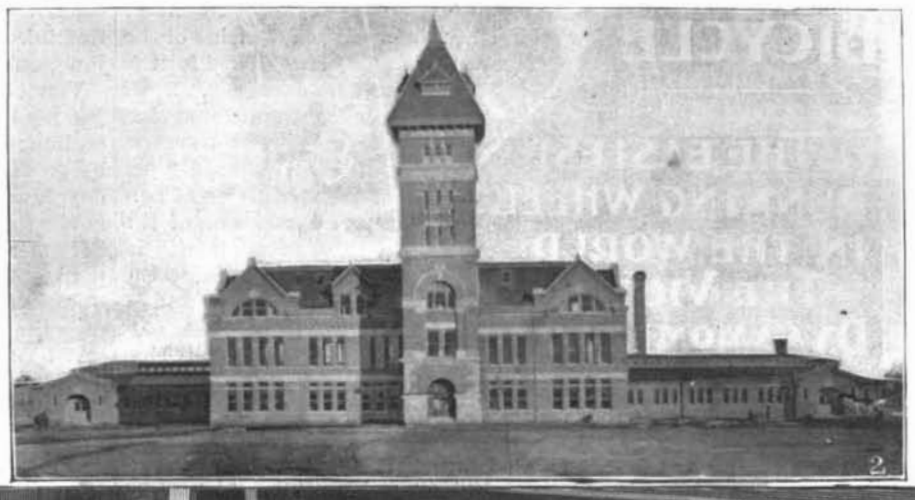
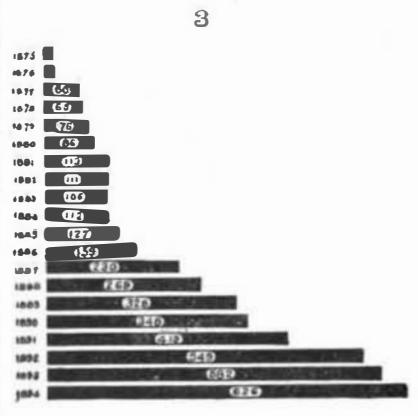
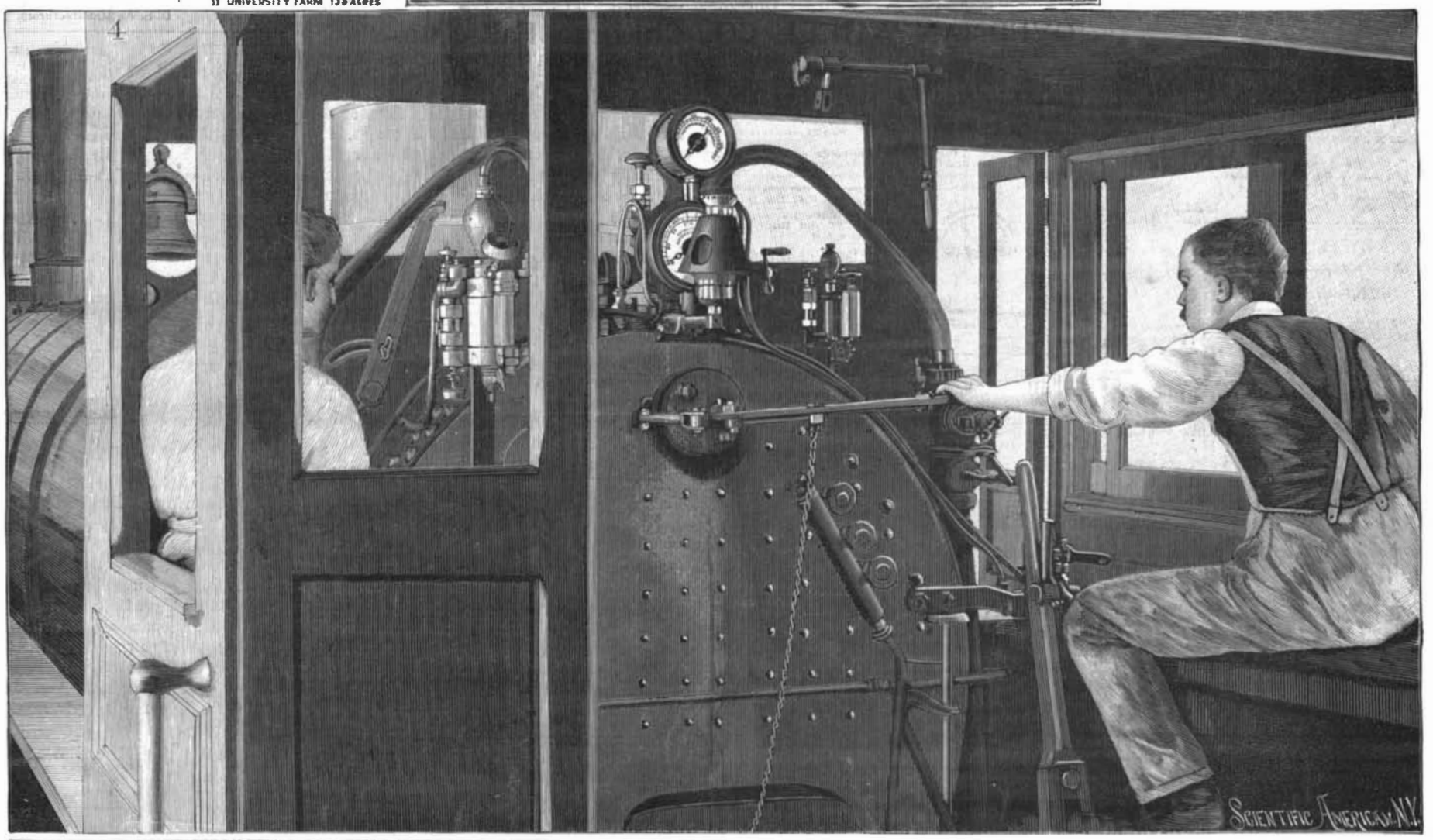


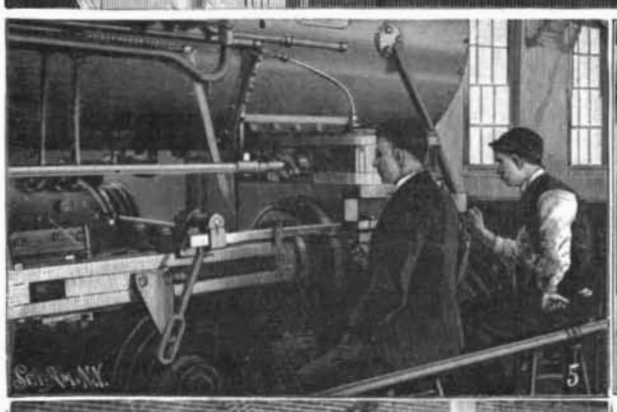


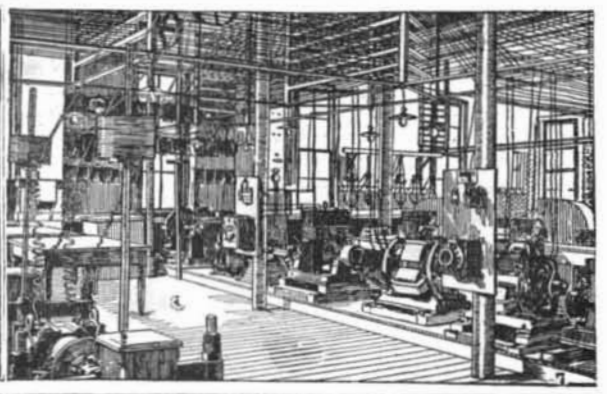
1 ARMORY
2 DORMITORY
3 SCIENCE HALL
4 ELECTRIC BUILDING
5 ENGINEERING BUILDING
6 LOCOMOTIVE LABORATORY
7 PHARMACEUTICAL LABORATORY
8 UNIVERSITY HALL
9 ART HALL
10 U.S. EXPERIMENT STATION
11 UNIVERSITY FARM 135 ACRES

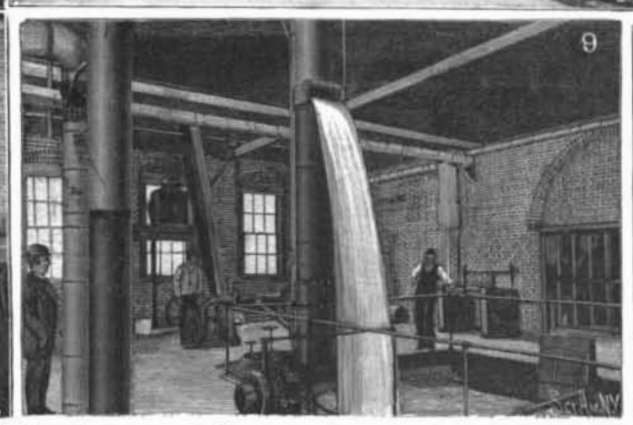












1. Plan of campus, showing location of the more important buildings. 2. Engineering building. 3. Diagram showing number of students in attendance, 1875-94. 4. Locomotive testing: In the cab. 5. Taking indicator diagrams. 6. Field engineering. 7. A corner in the dynamo room. 8. Testing strength of beams. 9. Testing centrifugal pump. 10. Working up a test.

PURDUE UNIVERSITY, LA FAYETTE, IND.—[See page 292.]