Woodhead, Cambridge, vice-president; and Dr. Maud E. Abbott, Montreal, secretary-treasurer. It was decided to publish a bulletin and an editorial committee consisting of Drs. Aldred S. Warthin, Ann Arbor, Mich.; Dr. Aschhoff, Freiburg, Germany; and Dr. Frederick F. Russell, Washington, with the president and secretary ex-officio, was appointed. Among the subjects discussed at the meeting were "The Exchange of Specimens," "Elevation of the Medical Museum as a Teaching Medium," "Index Pathologicus," "Classification of Specimens," and "Methods of Technic." The next meeting of the association will be held in Boston in April next, following the meeting of the Association of American Pathologists and Bacteriologists.

Along the lines of the Erie Railroad in western New York a train will be run this fall by the New York State College of Agriculture at Cornell. The train will be known as the "Educational Special." On board will be about a dozen senior members of the agricultural faculty. At each station, where a stop of forty-five minutes will be made, the professors will talk to the farmers and answer any questions that may be asked by seekers for information about improved methods of farming. Circulars and posters will be sent in advance, so that the exact time of the arrival of the train may be known. Towns on the main line, the Rochester division and the Hornell and Attica division and their branches will probably be visited and the party will be on the road about ten days.

As a result of recent cooperative work with the state board of health of Rhode Island, the United States Geological Survey has accumulated a large amount of data in regard to textile and other factory wastes, the processes which produce them, their effects on streams into which they may flow, and methods by which their deleterious effects may be reduced to a minimum. This information will soon be made available to the general public through the medium of one of the survey's water-supply papers. The factory wastes studied in detail are those resulting from wool scouring, cotton-yarn bleaching, cotton-yarn dyeing, and cotton-cloth bleaching, and from the manufacture of fertilizer, glue and oleomargarine. Experimental purification of the wastes was undertaken with varying results. The details of the experiments, with estimates of probable cost and degree of purification, will be given in full in the forthcoming paper. It was found that all the wastes studied can be satisfactorily purified at a reasonable expense. The sewage from the manufacture of fertilizer, glue and oleomargarine contains enough valuable matter to pay the costs of treatment, and the recovery of wool fat and potash from wool-scouring liquor will in many cases result in a substantial profit. The pollution of streams and consequent destruction of natural water resources by such liquid wastes therefore seems to be unwarranted.

UNIVERSITY AND EDUCATIONAL NEWS

A bill has been introduced in the Vermont legislature appropriating $6,000 annually for the establishment of a department of pedagogy in Middlebury College.

Professor Liveing has given to Cambridge University almost the whole of the apparatus and material belonging to him in the chemical laboratory.

The attendance at the University of Cincinnati this year, exclusive of the external students, is as follows: liberal arts, 409; engineering, 191; teachers, 191; medical, 119; law, 82; graduate, 85.

We learn from the *Experiment Station Record* that in accordance with the law passed by the first state legislature of Oklahoma providing for the establishment and maintenance of agricultural schools of secondary grade in each supreme court district of the state, two schools have been established this year, one known as the Murray State School of Agriculture, located at Tishomingo in Johnston County and the other at Warner in Muskogee County. These state schools will offer no courses of instruction other than industrial courses. Each school has an appropriation for the first year of $20,000 for buildings and $12,000 for maintenance. One fourth of the maintenance fund for each school must

be expended in developing agricultural experiments in the field, barn, orchard, shop and garden. The Tishomingo School has 120 acres of land and the Warner School, 160 acres. These and the other similar schools in the state will be under the supervision of the state commission of agricultural and industrial education, which consists of the state superintendent of public instruction, the president of the state board of agriculture and the president of the Agricultural and Mechanical College. The Murray School will open this fall and will be in session eight months.

DR. ALBERT ROSS HILL will be inaugurated as president of the University of Missouri on December 10. The principal speaker will be Dr. J. G. Schurman, president of Cornell University.

MR. R. J. H. DELOACH, botanist to the Georgia Experiment Station, has resigned to accept a professorship of cotton industry in the State Agricultural College at Athens.

THE following appointments have been made in the philosophical department of the University of Michigan: DeWitt H. Parker, Ph.D. (Harvard) to be instructor in philosophy; F. C. Dockeray, A.B. (Mich.), and Elmer C. Adams, A.B. (Mich.), to be assistants in psychology.

INSTRUCTORS at the University of Cincinnati have been appointed as follows: Harry Louis Wieman, biology; Charles N. Moore, mathematics; Taylor S. Carter, physics; Joseph Eugene Root, civil engineering; Howard A. Dorsey, mechanical engineering, and Murrell Edwards, physical education.

MR. A. R. BROWN, who recently returned from an anthropological expedition to the Andaman Islands, has been elected to a fellowship at Trinity College, Cambridge.

DISCUSSION AND CORRESPONDENCE

THE TEACHING OF MATHEMATICS TO ENGINEERS

TO THE EDITOR OF SCIENCE: Doubtless many physics teachers in our technical schools and universities have followed with great interest the spirited discussion on the teaching of mathematics to students of engineering, recently published in SCIENCE, and I have been wondering if any of them had the same uncomfortable feeling which I had while listening to some of the criticisms. Again and again I could not help but think of a well-known biblical quotation about the mote and the beam. Professor Franklin's letter, October 2, shows that I do not stand alone in this matter.

Aside from actual deficiencies in the knowledge of mathematics depending upon local conditions and personal aptitude, it is apparent that our students beginning engineering subjects show often a deplorable lack of ability to express practical problems in mathematical form and to properly interpret the results after the formal operations upon the mathematical equations have been completed. As Professor Slichter says: "They very generally lack the power to do anything with the mathematics they have been taught." The statement that mathematics is nothing but a tool for the future engineer means that it is only the teaching of the mere mechanical operations enabling the student to solve certain equations. Whoever uses the phrase in this sense confounds the tools *of* mathematics which he borrows from it, with the science itself, and it would be better for him to study a little more real mathematics.

I believe, however, that we all agree that it is highly desirable that our students in engineering should obtain a greater skill in handling these tools, falsely called mathematics. But who is responsible for their lack of skill? Considering the small amount of time allotted to mathematics in many of our schools, the blame can not well be placed upon the teachers of this science alone; it is a severe impeachment of the teachers of engineering and—of the teachers of physics.

It seems remarkable that only in a few instances during the whole discussion was any mention made of physics. Do the students pass directly from mathematics to the purely engineering courses? If so, it is a grave mistake. Students taking elementary mathematics have very little knowledge of physical facts and it was well said: "To illustrate a new mathematical principle by an application to a science with which a student