Dr. George S. Graham has been appointed second assistant pathologist and Dr. Edgar M. Medler research assistant in pathology, at the Boston City Hospital.

Dr. Irving Perrine, professor of geology and paleontology at the University of Oklahoma, has resigned to become head geologist to the Pierce Oil Corporation, of St. Louis, Mo. With him goes Mr. L. E. Trout, at present chief geologist of the Oklahoma State Geological Survey. They will make their headquarters at Oklahoma City, Okla.

Curator William C. Mills, of the Ohio State Archeological Museum, will leave for Scioto County in two weeks, where he with two assistants, H. C. Shetrone, of the museum, and William Holdermann, of Columbia University, will superintend explorations in the mounds of that vicinity. This trip is taken by members of the Ohio State Historical and Archeological Society each year. The party which includes, besides a photographer, a surveyor and a working force, will live in tents during the summer. Data and relics will be collected and afterwards tabulated and recorded by Dr. Mills. Bound copies will be made of these records and placed in the museum.

Dr. Richard C. Cabot has been appointed medical adviser to Radcliffe College.

Sir Nathaniel Barnaby, the British naval engineer, died on June 15, at eighty-six years of age.

## *UNIVERSITY AND EDUCATIONAL NEWS*

In honor of Dr. Wheeler, since 1899 president of the University of California, the regents have voted that the new classroom building to be begun in July, 1915, shall be named Benjamin Ide Wheeler Hall. This white granite building is being erected at a cost of $800,000 from proceeds of the bond issue of $1,800,000 voted in November, 1914. Plans are being prepared also for an additional agricultural building to cost $350,000; for the first unit of a new group of chemistry buildings, this structure to cost $250,000; and for the completion at a cost of $400,000 of the university library.

Arrangements for an exchange of professors between the University of Washington and the University of the Philippines have progressed to the stage where it is probable that Dr. Horace G. Byers, professor of chemistry in the University of Washington, will spend the next year in Manila. In the event of his going, Professor Horace G. Deming, a graduate of the University of Washington, head of the department of chemistry in the University of the Philippines, will go to the University of Washington for the year.

The trustees of Cornell University have elected Alexander M. Gray to be professor of electrical engineering and head of the department of electrical engineering in Sibley College. Professor Gray will begin his work at Cornell in the fall. He has been for several years a member of the faculty of McGill University. The head professorship of electrical engineering in Sibley College was resigned by Professor H. H. Norris two years ago and Professor Vladimir Karapetoff has been acting head of the department.

At the Carnegie Institute of Technology, James Burt Miner, of the University of Minnesota, has been appointed assistant professor of psychology. Louis L. Thurstone, graduate student at the University of Chicago, and Margaret L. Free, of Bryn Mawr, have been appointed assistants in the bureau of mental tests. Jonathan L. Zerbe and Katharine Murdoch remain as instructors in educational psychology. Among the aims of the department is the study of the psychology of industrial processes and of the teaching of those processes.

Dr. W. C. Allee, who had charge of the department of zoology at the University of Oklahoma this year, during the temporary absence of Dr. H. H. Lane, has been appointed head of the department of zoology of Lake Forrest College.

Dr. F. E. Chidester, assistant professor of biology and in charge of the courses in zoology at Rutgers College, has recently been promoted to the headship of a new department of zoology, with the rank of associate professor.

DR. GEO. I. ADAMS, who has been professor of geology and mining at the Pei Yang University at Tientsin, China, has been appointed to the faculty of the Government University at Peking.

MR. C. T. R. WILSON, F.R.S., lecturer in experimental physics at the University of Cambridge, has been elected to a fellowship in Sidney Sussex College for a period of five years.

THE board of Trinity College, Dublin, has appointed Miss E. M. Maxwell, of the Royal Victoria Eye and Ear Hospital, Dublin, to the Montgomery lectureship in ophthalmology.

## *DISCUSSION AND CORRESPONDENCE*

### APPLICATION OF PETROGRAPHIC METHODS TO ANALYTICAL CHEMISTRY

WHEN it is considered that minerals are fundamentally more or less definite chemical compounds and that optical mineralogy has attained a high stage of development and importance, it is a matter of considerable surprise that the application of petrographic methods to general chemistry has been attempted in so relatively few instances and that at present, speaking generally, crystal optics is a subject almost unheard of among the great majority of chemists. Chemical literature is filled with such vague crystal descriptions as "needles," "tablets," etc., which it is hardly necessary to say are almost worthless—absolutely so when taken out of connection with the reactions of the compounds. Crystallographic measurements are not always possible, are tedious, and lack general applicability. Microchemical reactions usually resolve themselves into simple observation of the appearances of the crystals formed, a procedure open to the objection that in many cases very diverse substances crystallize rather similarly. Petrographic methods are open to none of these objections. In a very large number of substances the optical data is definitive. The methods are of general applicability to crystalline material regardless of the existence or non-existence of crystal faces, and are rapid and comparatively simple.

It is well known that the rock-forming minerals are now usually determined by microscopic examination and that it is even possible to calculate approximately the chemical composition of a rock from the data thus obtained. In some rather rare instances these same methods have been extended to chemical compounds other than minerals. In 1898 J. L. C. Schroeder van der Kolk[1] published an acount of petrographic methods and applied them to certain artificial salts. Otto Rosenheim[2] by a determination of the optical characters, positive or negative, of phrenosin and kerasin, obtained from the brain, succeeded in differentiating these two substances. This test was confirmed in this laboratory on the same materials obtained from molds. Fry[3] has applied petrographic methods to the determination of the various salts ordinarily occurring in commercial fertilizers, and to the determination of mixed solids obtained in certain phase-rule work,[4] all cases where chemical analysis could not give the desired results. In a very recent address before the Chemical Society of Washington Dr. F. E. Wright called attention to the utility of petrographic methods in chemical analysis, and during this address and the succeeding discussion several specific applications were pointed out, notably that of the differentiation of the sugars. The published reports of Dr. Wright and coworkers afford numerous instances of the valuable application of petrographic methods to many substances, especially in the examination of products obtained in various melts. This work can not be too highly commended. Chamot[5] has emphasized the usefulness of the methods.

Recently the literature has been searched and practically complete optical data has been found for over 375 chemical individuals ranging from simple elements to the more complex inorganic and organic compounds. In addition there is an immense number of compounds of which some of the data is known. This makes it quite possible to definitely identify quite a

[1] "Kurze Anleitung zur Mikroskopischen Krystallbestimmung," Wiesbaden.

[2] *Biochem. Jour.*, 8, 110, 1914.

[3] U. S. Dept. of Agric., Bul. 97, 1914.

[4] Parker, *Jour. Phys. Chem.*, 18, 653–61, 1914.

[5] "Elementary Chemical Microscopy."