

graduates other employees of the corporation. There are 1,000 students now enrolled.

THE address of Dr. G. E. Coghill, recently announced as Beaufort, N. C., is now Gainesville, Fla., where he expects to reside permanently.

DR. LEWIS H. WEED, professor of anatomy and director of the School of Medicine of the Johns Hopkins University, has been invited by the University of London to deliver the advanced course in anatomy. It is understood that he will lecture in London in the spring of 1937 and will choose for his subject "The Cerebrospinal Fluid."

DR. ARTHUR H. COMPTON, professor of physics, delivered the convocation address at the University of Chicago on December 15. The title of the address was "Can Science Point the Way?"

DR. RODNEY H. TRUE, chairman of the department of botany at the University of Pennsylvania, delivered a Sigma Xi lecture at the Massachusetts State College on December 7. He spoke on "Erosion."

DR. COLIN G. FINK, professor of electrochemistry at Columbia University, has planned a western trip during which he will speak before twenty local sections of the American Chemical Society, the American Institute of Mining Engineers and university groups on the following subjects: "Research in Electrochemistry," "Electrochemistry in Industry," "Corrosion" and "Chemistry in Art."

ERNEST H. ANTHERS, director of the New York Division of the Bausch and Lomb Optical Company, visited the School of Tropical Medicine, San Juan, Puerto Rico, in December, where he lectured on the history of the microscope, its design and manufacture, with special reference to illumination methods.

THE annual Science Congress and Christmas lectures of the American Institute of the City of New York were held on December 28 and 29. The lecturers and their subjects were as follows: Dr. Harlow Shapley, director of the Harvard College Observatory, "Broadcasting from Antares"; Dr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry*, "New Man-made Materials," and G. Edward Pendray, secretary of the American Rocket Society, "Rocketing through Space."

A DINNER in honor of the British Association was given recently by the Technical Group of the Forum Club, London. Miss Caroline Haslett, director of the Electrical Association for Women, presided, and the chief guest was Sir Josiah Stamp, president of the British Association. Other speakers were Sir Edward Poulton, president-elect of the association, and Professor William Cramp.

AT the Paris Exposition of 1937, an International Congress of Physical Education and Sport will be held during the week beginning July 14. The National Committee of French Sports and the president of the committee of organization, Dr. Collect, will have charge of the program. The object of the congress is to interest the French medical profession in encouraging boys and girls to take up sports in a more active manner than is at present the case.

FOUR fellowships named in memory of the late Dr. Arthur D. Little, for many years a member of the corporation, have been announced by Dr. Harry M. Goodwin, dean of the Graduate School of the Massachusetts Institute of Technology. Two of the fellowships will be known as the Arthur D. Little post-doctorate fellowships, carrying stipends of \$1,500 each, with facilities for research in the institute's laboratories. The other two are to be known as the Arthur D. Little fellowships and entitle their holders to stipends of \$1,000. They are open to graduate students pursuing studies for the doctor's degree in the fields of chemistry and chemical engineering, respectively. The announcement was made in connection with the dedication of the industrial museum which has been established at the headquarters of the Arthur D. Little Company on the occasion of the fiftieth anniversary of this widely known research organization.

THE College of Mines and Metallurgy, a branch of the University of Texas, has been unanimously accepted as a member of the Association of Colleges and Secondary Schools of the Southern States. Membership of the College of Mines followed application made last year and an examining tour by a survey committee of the association, composed of M. C. Huntley, executive secretary of the association; D. M. Key, president of Millsaps College, Jackson, Miss., and Dr. B. Gould, Sophie Newcomb College, New Orleans, La.

DISCUSSION

THE EARTH'S CORE

ONE of the problems that has long puzzled seismologists is the nature of the earth's interior. That the earth is not a homogeneous body has long been known. The existence of a definite core some half the diameter

of the earth seems well established. Reflected waves from this core and refracted waves through it seem to identify its existence beyond reasonable doubt. But what is the nature of the core? Is it solid liquid or gas? Let us see some of the conditions it must satisfy.

In density it must be such as to allow of a mean density of about 5.5 as concluded from the results of Boys and others. Accepting Gutenberg's radius of the core, this would seem to require (following Jeffreys) a core density of about 12 (crustal density 4.2). This comparatively high density of the core has led to the general view that it is metallic—iron, nickel and such substances being mentioned as possible constituents.

In the matter of rigidity, the core must be considerably less rigid than the shell if the total rigidity is to fit in with that demanded by tidal phenomena and the Eulerian nutation. Jeffreys suggests the zero rigidity of a liquid core.

In its behavior to shear waves it is difficult to say what conditions the core must satisfy. In view of the identification of core shear waves claimed by Macellwane, Krumbach, Imamura and Bastings, it seems that the core must be capable of transmitting a shear wave, but with considerable loss of energy as compared with the compressional wave. The compressional waves are quite prominent after passing through the core, whereas, apart from the isolated cases of identification mentioned above, the shear wave fails to appear.

In view of these required conditions, the picture of the core that most nearly suits our facts is a solid metallic core heavily occluded with some such gas as hydrogen. Experiments with palladium occluded with several hundred times its own volume of hydrogen have revealed effects on its elastic constants that point in this direction. Such a solid metallic sponge for core would seem to give the right values for density, rigidity and small shear wave energy. Experiments to determine the effect of occlusion on elastic properties and particularly on shear wave energy are being carried on. Their results will be published shortly.

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CELL INCLUSIONS AND THE LIFE CYCLE OF *AZOTOBACTER CHROOCOCCUM*

FOR some time the writer has been engaged in a study of the so-called life cycle of *Azotobacter chroococcum*. While these experiments have not been brought to completion, one point of particular significance may be recorded here. A search of the literature reveals the fact that much confusion exists concerning the nature of the granular bodies which are invariably present in the cells of *Azotobacter* at certain periods of growth.

Jones¹ noted two types of granules which differed from each other in staining capacity. Some of the granules were not stained by aqueous solutions of

aniline dyes, while others became intensely stained. He regarded the stainable bodies as reproductive cells or gonidia. Löhnis and Smith² made similar observations and conclusions. Menez³ regarded the granules as a chromidial system and the equivalent of a true nucleus. Prazmowski⁴ believed that each cell contains one nucleus which divides preceding cell division. Schmidt⁵ reported the presence of volutin. There is no indication that any of the other workers performed microchemical or solubility tests to determine whether the stainable bodies are living entities of the cell or lifeless cell inclusions which function as reserve food. In the absence of precise knowledge concerning the true nature of the granular bodies, any theory as to their function must be doubted.

Experiments were performed, therefore, to determine the reactions which occur when standard tests for fat, volutin and glycogen are applied. The colorless granules are readily identified as fat bodies, while the stainable granules consist of volutin. It is obvious, therefore, that these bodies could not perform the vital functions assigned to them by previous writers. So far as this species is concerned there seems no support for the conception of a life cycle which involves reproduction by means of gonidia.

Additional work is in progress dealing with reproduction by symplasm, conjunction and endospore formation and the question of cell transmutation. The results of this study will be published elsewhere.

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THE NEW AMERICAN DICTIONARY

NOTICE of publication by the University of Chicago Press of Part 1 of "A Dictionary of American English" has undoubtedly come to the attention of many American scientists, but perhaps few who have not actually seen the work are aware of its importance scientifically.

This dictionary, based on historical principles, is compiled under the editorship of Sir William Craigie, co-editor of the Oxford English Dictionary. In a letter I received from Professor Craigie in 1928, when the work of compilation had barely begun, he stated: "The New Dictionary will not aim at the inclusion of purely scientific terminology, but it ought to include the popular names of animals, birds, etc., so far as these can be historically traced." In this particular aspect the dictionary is succeeding admirably and

² F. Löhnis and N. R. Smith, *Jour. Agr. Res.*, 6: 675, 1916.

³ E. Menez, *Arch. f. Protistenk.*, 22: 1, 1911.

⁴ A. Prazmowski, *Centralblt. f. Bakt.*, etc., II Abt., 33: 292, 1912.

⁵ E. W. Schmidt, *Centralblt. f. Bakt.*, etc., II Abt., 50: 44, 1920.

¹ Dan H. Jones, *Jour. Bact.*, 5: 325, 1920.