

secretary for one year prior to that, and having passed the age of seventy-two years, I wish to resign from the office, my resignation to take effect as of July 1, 1944.

I feel that it would be quite unfair to the Institution to continue in this responsible position when in the nature of things my capacity must gradually begin to decline. In tendering my resignation I wish to express my gratitude to the board for its kindly and helpful attitude and my desire to be of any service which the board or my successor may feel disposed to suggest.

Dr. Alexander Wetmore, assistant secretary, automatically becomes acting secretary. Dr. Abbot will remain on the staff under the title of research associate.

In resigning the secretaryship Dr. Abbot thanked the members of the staff for their unwavering support and their kindly attitude towards him. He bespoke for his successor and for the institution the continued loyalty and devoted service which had been given so generously during his administration.

SCIENTIFIC NOTES AND NEWS

A PORTRAIT of Dr. Anton J. Carlson, emeritus professor of physiology of the University of Chicago, president of the American Association for the Advancement of Science, was presented to Augustana College, Rock Island, at a recent banquet of the alumni. Dr. Carlson graduated from the college in 1898.

DR. ELMER V. MCCOLLUM, professor of biochemistry at the School of Hygiene and Public Health of the Johns Hopkins University, has been elected a foreign member of the Swedish Academy of Sciences.

DR. HARLOW SHAPLEY, director of the Harvard Observatory, was presented by the Mexican Government with the Order of the Aztec Eagle, third class, at a reception given on July 22 by the Mexican ambassador and Senora de Castillo Najera, in recognition of his cooperation in arranging for the installation of the telescope of the National Astrophysical Observatory at Tonanzintla.

THE University of Oxford will confer an honorary doctorate of science on Dr. Isaiah Bowman, president of the Johns Hopkins University.

THE honorary degree of doctor of science was conferred by the University of Oregon at its sixty-seventh annual commencement on June 4 on Dr. Ralph Works Chaney, professor of paleontology at the University of California. The citation reads: "In recognition of his penetrating researches in paleobotany in general and of the Oregon area in particular; his unique understanding of the historical geology of Western America in relation to that of Asiatic countries; and his deep appreciation of the kinship of science in its broadest aspects and its contribution to the understanding of human values."

WESLEYAN UNIVERSITY at its commencement on June 25 conferred the honorary degree of doctor of science on Dr. Stanley D. Wilson, formerly professor of organic chemistry and dean of the College of Natural Sciences at Yenching University, Peking. Professor Wilson was repatriated on the *Gripsholm* and arrived

in New York in December, 1943. He has been engaged since in research at the California Institute of Technology, and now has been appointed visiting professor of chemistry at Pomona College, where he will take up work on September 1.

THE degree of doctor of laws was conferred at the commencement exercises of the University of Wyoming on Dr. James F. Wilson, professor of animal husbandry at the College of Agriculture at Davis of the University of California.

DR. LELAND W. PARR, professor of bacteriology and head of the department of the School of Medicine of George Washington University, has been elected secretary-treasurer of the Society of American Bacteriologists.

AT the annual general meeting of the British Physical Society held on May 24, the following officers were elected: *President*, Professor E. N. da C. Andrade; *Vice-president*, Sir Edward Appleton; *Honorary Secretaries*, J. H. Awbrey (Papers) and Dr. W. Jevons (Business); *Honorary Treasurer*, Dr. C. C. Paterson; *New Members of Council*, Professor S. Chapman, C. H. Collie and Professor H. R. Robinson. At an extraordinary general meeting held on the same day A. F. Joffe was elected an honorary fellow.

THE title of emeritus has been conferred on Dr. Joseph C. Bock, professor of biochemistry at the School of Medicine of Marquette University. He retires after teaching for thirty-two years.

DR. RONALD A. SILOW, formerly assistant geneticist of the Cotton Research Station of the Empire Cotton Growing Corporation, Trinidad, British West Indies, has been appointed visiting professor for the coming year in connection with the Blandy Experimental Farm of the University of Virginia.

DR. WILLIAM WALTER GREULICH, professor of physical anthropology and anatomy and director of the Brush Foundation of the School of Medicine of Western Reserve University, has been appointed professor of anatomy at Stanford University.

DR. J. FISHER STANFIELD, of the State University of Iowa, has been appointed professor of botany and bacteriology and head of the department at Miami University.

DR. MAURICE EWING, now engaged in research for the Navy with the civilian rank of "chief scientist," has been appointed associate professor of geophysics in the department of geology of Columbia University. He will direct graduate instruction in geophysics as part of a postwar program of geological training and research. He also plans to continue his investigations of the continental shelf and the ocean basins.

At the University of Illinois the following members of the faculty have been advanced to full professorships: Dr. Reinhold Baer, mathematics; Dr. R. R. Kudo and Dr. F. B. Adamstone, zoology-physiology; M. K. Fahnestock, mechanical engineering; Dr. L. M. Mott-Smith and Dr. Leland J. Haworth, physics, and Dr. O. T. Bonnett, agronomy.

At Kansas State College, Dr. A. D. Weber has been appointed head of the department of animal husbandry to succeed Dr. C. W. McCampbell, who recently retired to teach and to carry on research work. Dr. James E. Ackert, in addition to his work as dean of the Graduate School, has been made head of the department of zoology. He succeeds Dr. Robert K. Nabours, who will devote his full time to research. Dr. J. H. Burt has retired as head of the department of anatomy and physiology in the School of Veterinary Medicine, but will continue to teach full time. This department has been divided, with Dr. W. M. McLeod as head of the department of anatomy and Dr. E. E. Leasure as head of the department of physiology.

At the University of London, Dr. Frank Horton, professor of physics, has been re-elected vice-chancellor. Dr. H. T. Flint, reader in physics at King's College, has been appointed to the Hildred Carlile chair of physics tenable at Bedford College and Dr. W. N. Bailey, lecturer in mathematics in the University of Manchester, to the university chair of mathematics, also tenable at Bedford College. Dr. S. W. Woolridge, reader in geography at King's College, has been appointed to the chair in geography tenable at Birkbeck College. He succeeds Professor E. G. R. Taylor, who has retired. The title of reader in zoology at University College has been conferred on G. P. Wells.

DR. H. G. SANDERS, lecturer in agriculture at the University of Cambridge, has been appointed professor of agriculture at the University of Reading. He succeeds Professor Robert Rae, who has been appointed agricultural attaché to the British Embassy at Washington.

DR. JOHN R. SWANTON, ethnologist of the Bureau of American Ethnology, has retired after forty-four years' continuous service. At a reception on June 30 his friends and associates took the opportunity to wish him well and many years of happiness. He has been given an honorary appointment as collaborator of the Bureau of American Ethnology. He will live in New England.

DR. DONALD B. KEYES, professor of chemical engineering and head of this division at the University of Illinois, who since 1943 has been chief of the chemical industries branch of the Office of Production, Research and Development of the War Production Board, has been appointed director of the office. He succeeds Dr. Harvey N. Davis, who plans to devote his full time to the presidency of Stevens Institute of Technology.

PROFESSOR VERNON L. FRAMPTON has resigned from the department of plant pathology of Cornell University, to become affiliated with the research division of the National Cotton Council.

DR. ARTHUR P. RICHARDSON, professor and head of the department of pharmacology of the College of Medicine of the University of Tennessee, has been appointed head of the division of pharmacology of the Squibb Institute for Medical Research, New Brunswick. He succeeds Dr. Harry B. Van Dyke, who has become head of the department of pharmacology of the College of Physicians and Surgeons of Columbia University.

DR. OTTO SCHALES, research associate in medicine and tutor in the biochemical sciences at Harvard University, director of the Clinical Laboratories of the Peter Bent Brigham Hospital, has been appointed director of chemical research of the Ochsner Foundation and director of the Biochemical Laboratory at the Ochsner Clinic, New Orleans. The new chemical laboratories of the Ochsner Foundation will specialize in research on the therapeutic aspects of medical enzymology.

P. M. ROXBY, who is retiring from the Rankine chair of geography at the University of Liverpool, which was endowed for him in 1917, will go to Chungking at the invitation of the British Council to be a chief cultural link between China and Great Britain. Professor Roxby has been associated with the department of geography of the university since 1906.

DR. CHARLES HALLILEY KELLAWAY, F.R.S., director of the Walter and Eliza Hall Institute of Research in Pathology and Medicine of the Royal Melbourne Hospital, Australia, has been appointed director of the Wellcome Foundation Research Laboratories in England and in the United States. His headquarters will be in London. Dr. Frank M. Burnet will take charge of the work at Melbourne.

DR. ROBERT REDFIELD, professor of anthropology at the University of Chicago and dean of the Division of the Social Sciences, has leave of absence for six months beginning in September to make a study of social science problems in China. The trip is sponsored jointly by the Social Science Research Council and the University of Chicago. It will be financed by a grant of the Rockefeller Foundation.

DR. VINCENT DU VIGNEAUD, professor of biochemistry at Cornell University Medical College, will deliver on August 1, 3 and 8 the Hitchcock lectures of the University of California at Berkeley. The Hitchcock Foundation, which provides lecturers on "scientific and practical subjects but not for the advantage of any religious sect or upon political subjects" was established in 1872 by Charles M. Hitchcock. A bequest from his daughter, Mrs. Lillie Hitchcock Coit, increased the endowment to \$125,000.

THE annual meetings of the Association of American Geographers and of the National Council of Geography Teachers, that were to have been held from September 10 to 13, have been cancelled.

THE demand for the Smithsonian War Background Studies has been so great that it is no longer possible to continue to print more copies for unrestricted free distribution. The entire cost of the series has been

defrayed from the private funds of the institution, and money for a further free edition is not available. The editions of most of the papers have been practically exhausted, and in order that they may continue to be available to those who need them, it has been decided to print additional copies to be sold on a non-profit basis to individuals, other than members of the armed forces. These will be available in August. Hereafter the smaller papers, Nos. 2, 3, 5, 8, 12 and 17, will be sold for 10 cents a copy; all others for 25 cents a copy.

THE Nutrition Foundation has awarded grants to the Harvard Medical School, Boston, to support fellowships in clinical nutrition for the years 1944, 1945 and 1946. The fund will be administered under the supervision of Dr. Frederick J. Stare, assistant professor of biochemistry and nutrition. The fellowships provide for post-doctorate training in medicine and for advanced training in medical nutrition for dietitians.

THE Sealy and Smith Foundation has offered a million dollars to the University of Texas for a new general hospital unit at Galveston. The gift is contingent on an appropriation by the university of a second million dollars.

DISCUSSION

EXOTOXINS FROM SLIME MOLDS

LIVING cells exude waste products. This is a well-known physiological function which presents a variety of problems, one of which is the toxic effect of the waste products of one cell upon another. Several years ago I observed the reaction of a slime mold to the exotoxins given off by another slime mold. Publication was delayed in the hope that some information could be had on the organic nature of the exuded waste products. As this has until now proved impossible—it will at best be a difficult task—I have chosen to report briefly the original observation, namely, the reaction of slime molds to one another's exotoxins.

The organism worked upon is the myxomycete, *Physarum polycephalum*, now a familiar source of material for physiological work on protoplasm. The plasmodium, or slime mold is a multinucleate, non-cellular body. The protoplasm of the slime mold *Physarum* is in a continual state of motion, except when dormant. Protoplasmic flow continues in one direction for three quarters of a minute and then reverses. The movement is, in its general appearance,

much like the ebb and flow of the tides. Streaming in the outward direction averages five seconds more than in the return direction: this additional time accounts for the onward progress, the locomotion, of the organism.

Botanists have presumably long known that slime molds rarely recross their tracks. Possibly the cause of this was also suspected to be the toxic nature of the residue left behind by the advancing mold. No more than this is known of the physiology or the chemistry of the waste products given off by slime molds. The exuded exotoxins may be regarded as secretion products, the whole organism functioning as a kidney. After all, this is true of any living cell. There is an unfortunate tendency in biology and medicine to regard protoplasm in a simple form such as the slime molds represent, as devoid of all the properties of higher organisms, thus forgetting that the properties of the organism as a whole exist in large measure because they are properties of protoplasm. The heart pulsates because protoplasm pulsates. If organisms show irritable response, protoplasm must do likewise. Kidneys secrete because protoplasm secretes.

My casual interest in the exotoxins of slime molds