traction, contributed to by Sir Seymour B. Tritton (steam power), Sir Henry Fowler (oil engine power), and Mr. F. Lydall (electric power). In Section D, Dr. Stanley Kemp will deal with "Oceanography in the Antarctic," and Mr. A. C. Stephen with "The Faunistic Divisions of the Floor of the North Sea." Professor A. C. Hardy will speak on "Plankton Research in the Service of the Fishing Industry." In the afternoon there will be a discussion in Sections D and H on "The Primates and Early Man," in which part will be taken by Dr. C. Tate Regan, Dr. A. B. Appleton, Professor J. S. Shellshear, Dr. S. Zuckerman and Dr. Carter, and another on "The Techniques, Possibilities and Limitations of the Measurement of Human Effort as a Basis of Monetary Reward." This will be in Section F; the chairman will be Dr. C. S. Myers, and those taking part will include Dr. C. H. Northcott and Dr. G. H. Miles.

The program on Tuesday includes a discussion in Section M on "The Distribution of Agricultural Products," and addresses on "Recent Changes in the Wheat Areas of the World," in Section E, by Mr. G. V. Jacks, and on "Effects of the World Depression on the Banking Systems of Central Europe," in Section F, by Dr. E. Roll. At the conference of delegates of corresponding societies Dr. C. B. Williams and Captain T. Dannreuther will explain "A Scheme for Recording Immigrant Insects in Great Britain." On Wednesday, Professor J. R. Bellerby will address Section F on "Inflation, the International Remedy," and in Section H, Mr. M. E. L. Mallowan will speak on "The Prehistoric Civilizations of Nineveh."

Two evening discourses have been arranged, one by Sir Arthur Hill on "Plant Products of the Empire in Relation to Human Needs," and the other by Mr. C. C. Paterson on "Uses of the Photo-electric Cell." Other evening engagements are the reception on Thursday by the Lord Mayor of York, Mr. R. H. Vernon Wragge, and the Sheriff, Mr. Arnold S. Rowntree, in the Exhibition Buildings, a public lecture by Mr. H. E. Wimperis in the Cooperative Hall on "Speed in Flight," and a discussion in Section L on "The Place of Science in the Education of Boys and Girls up to Sixteen Years of Age." The subject will be introduced by Sir Richard Gregory, and he will be followed by Sir H. B. Hartley, Mr. Donald Gray, Dr. W. W. Vaughan, Professor W. W. Watts and Mr. W. M. Heller.

An extensive program of visits to places of interest has been drawn up.

SCIENTIFIC NOTES AND NEWS

DR. ARTHUR H. COMPTON, professor of physics at the University of Chicago, has been elected a corresponding member of the Prussian Academy of Sciences.

AT the recent meeting of the American Society of Agricultural Engineers, Major O. V. P. Stout of Berkeley, irrigation engineer in the U. S. Department of Agriculture, was awarded the Cyrus W. McCormick medal, conferred annually in recognition of the most notable contribution in engineering for the year.

C. A. MENZEL, associate engineer at the Research Laboratory of the Portland Cement Association, was awarded the Charles B. Dudley Medal for 1932 at the thirty-fifth annual meeting of the American Society for Testing Materials. This medal, commemorating the name of the society's first president, is awarded annually to the author of a paper presented at the preceding annual meeting, which is of outstanding merit and constitutes an original contribution to research in engineering materials.

JOHN R. BAYLIS, physical chemist of the City of Chicago, was awarded, for work on activated carbon in water, the John M. Goodell Medal of the American Water Works Association at its fifty-second annual convention.

THE Longstaff Medal has been awarded by the Chemical Society of London jointly to Professor W. N. Haworth, of the University of Birmingham, and Sir James Irvine, of the University of St. Andrews, for their work on the chemistry of the sugars.

LECTURERS have been appointed by the Royal College of Physicians, London, as follows: For 1933 Sir Thomas Lewis, Harveian orator; Sir Humphry Rolleston, Fitzpatrick lecturer; Dr. C. S. Myers, Bradshaw lecturer; Dr. C. R. Box, Lumleian lecturer; Dr. C. E. Newman, Goulstonian lecturer; Dr. E. A. Carmichael, Oliver-Sharpey lecturer; Dr. W. G. Savage, Mitchell lecturer, and for 1934 Professor O. L. V. S. de Wesselow, Croonian lecturer.

IN honor of Professor Henry C. Sherman, head of the department of chemistry at Columbia University, a dinner was given recently in the Women's Faculty Club at the University of California, by a group of nutrition workers. Dr. Agnes Fay Morgan, of the department of household science, introduced Dr. Sherman, who spoke on his recent vitamin researches.

DR. M. A. BLISS, St. Louis, a member of the board of managers of Missouri eleemosynary institutions, for several years president of the Missouri Society of Mental Hygiene, was recently presented with the

Distinguished Service Medal for conspicuous service in private life, the first award of the medal since its authorization by the last legislature. The presentation was made by Governor Caulfield in the State Senate Chamber, with prominent physicians and members of the state eleemosynary board in attendance. Dr. Bliss organized the Child Guidance Clinic of St. Louis and the St. Louis Training School for the Feebleminded.

JOHN EDWARD LENNARD-JONES, professor of theoretical physics in the University of Bristol, has been elected to the John Humphrey Plummer professorship of inorganic chemistry at the University of Cambridge.

DR. LESLIE A. WHITE has been promoted to an associate professorship of anthropology in the University of Michigan.

DR. R. H. KAMPMEIER, instructor in medicine at the Medical School of the University of Michigan, has been appointed assistant professor of medicine at the Medical Center of the Louisiana State University.

DR. FLORENCE B. SEIBERT, of the Sprague Memorial Institute of the University of Chicago, has become assistant professor of biochemistry at the Henry Phipps Institute of the University of Pennsylvania.

DR. RUTH I. WALKER, of the department of biology of the University of Wisconsin Extension Center in Milwaukee, has been promoted to an assistant professorship of botany, and Dr. Joseph G. Baier has been appointed instructor in zoology. Dr. Walker will be acting chairman and Dr. Baier will have charge of the courses in zoology during the absence of Dr. D. C. Boughton, whose leave of absence has been extended so that he may continue his research on coccidia as a National Research Council fellow at the Johns Hopkins University.

RECENT appointments of graduates of the department of zoology of the University of California are: Blondell Carleton, teaching fellow, University of Rochester Medical School; Lloyd G. Ingles, associate professor of zoology, State Teachers College, Chico, California; Dr. James L. Leitch, associate professor of biology, Armstrong Junior College, Berkeley, California; Dr. Everett E. Lund, adjunct professor of biology, American University of Beirut, Syria; Dr. Ronald F. MacLennan, instructor, Washington State College, Pullman, Washington; Dr. R. I. Pencharz, research assistant, Rockefeller Institute; Dr. Owen L. Williams, assistant professor of biology, College of the Pacific, and Dr. Paul Thomas Wilson, professor of zoology, Marin Junior College, Kentfield, California.

DR. HARRY STOLL MUSTARD, assistant state commissioner of health for Tennessee, will take charge of the new public health district to be established in Baltimore.

A PENSION of £540 a year has been granted to Sir Joseph Larmor on his retirement from the Lucasian professorship of mathematics.

BECAUSE of ill health, F. E. Hamer has relinquished the editorship of *Chemical Age,* London, and placed himself on the retired list of Benn Brothers, Limited. He is to retain his position on the board of the company and remain a director at the unanimous wish of all his colleagues. Mr. Hamer was for many years the London correspondent of the news edition of *Industrial and Engineering Chemistry.*

DR. AUGUST KOPFF, professor of theoretical astronomy at the University of Berlin, reached New York on August 19. Dr. Kopff is a delegate from Germany to the meeting of the International Astronomical Union, which opens at Harvard University on September 2.

DR. WILLIAM BEEBE, of the New York Zoological Society, has returned from a month's reconnaissance of the shore fish fauna of some of the lesser known West Indies, such as Saba, Barbuda, Union and Mayero. The trip was made through the kindness of Colonel Edwin M. Chance on the yacht *Antares.* On August 13 Dr. Beebe left for Bermuda on the fifteenth expedition of the Tropical Research Department of the New York Zoological Society, together with his staff, Tee-Van, Hollister and Crane. Three months will be spent at the Bermuda Biological Station and on Nonsuch. In September an attempt will be made by Dr. Beebe and Mr. Barton in their bathysphere to reach a depth of half a mile.

PROFESSOR EVERETT F. PHILLIPS, of the department of apiculture at Cornell University, returned in July from a visit to Soviet Russia. He was invited by the Russian Government as a consultant on bee culture.

DR. T. C. JUNCKER, professor of botany at DePauw University, has sailed for Honolulu where he is to spend a year collecting in the Hawaiian Islands in the preparation of a revision of the Piperaceae of that area.

AN advisory board of five experts has been constituted by the Reconstruction Finance Corporation to aid in its work of facilitating and at the same time safeguarding loans for self-liquidating construction projects. The members of the board are: Dr. Charles David Marx, professor emeritus of civil engineering at Leland Stanford University, *chairman;* John Herbert Gregory, professor of civil and sanitary engineer-

ing at the Johns Hopkins University, Baltimore; John Francis Coleman, senior partner of the John F. Coleman Engineering Company, New Orleans; John Lyle Harrington, consulting engineer, Kansas City, and Major General Lytle Brown, Chief of Engineers, United States Army.

PROFESSOR ARCHIBALD V. HILL will deliver the inaugural address before the International Congress of Physiology, which opens at Rome on August 29. The subject of the address will be "Energy Exchanges in Muscle and Nerve."

THE eleventh annual scientific session of the American Congress of Physical Therapy will be held in New York City at the Hotel New Yorker from September 5 to 10. Scientific papers and symposia will be presented on September 6, 7, 8, and 9, and on the last day clinics will be conducted in fifteen New York hospitals.

THE third International Congress of Cytology will be held at the University of Cambridge in 1933.

THE second International Congress of Tropical Medicine, which was to have been held at Amsterdam next September, has been indefinitely postponed, owing to the present financial conditions.

ARTHUR HAWLEY SCRIBNER, president of the publishing house of Charles Scribner's Sons, who died at Mount Kisco, N. Y., on July 3, left $150,000 to Princeton University. The gift is payable upon the death of Mrs. Scribner.

CLEVELAND COLLEGE, which was originally made possible by a gift of $25,000 from the late Ellen Browning Scripps, has received by her will a trust fund of $50,000. The Museum of Natural History at Cleveland also receives a bequest of $50,000.

ACCORDING to the Canadian Press, Mrs. Jessie Dunlap has given to the University of Toronto a large telescope, which it is estimated will cost $500,000, for the David Dunlap Observatory, to be erected in memory of her husband. Construction will start at once on the two main buildings. On a circular platform 800 feet above sea level a round building 61 feet in diameter will be built to house the telescope, nearly all parts of which are being made in England. Larger than the one in the Dominion Government Observatory, Victoria, B. C., the telescope will be of the reflecting type and will have a mirror weighing 5,000 pounds. The telescope building and an administration building to be erected at a cost of $125,000 will be located in the center of a 177-acre plot, which will be known as the David Dunlap Park.

MR. SAMUEL A. COURTAULD, chairman of the Middlesex Hospital Medical School, London, has given £10,000 to increase the endowment of the S. A. Courtauld Institute of Biochemistry. This brings the total amount of his benefactions to the Medical School to £100,000. Its purpose is to stabilize the income of the school and its research departments, so that any economies required at the present time shall interfere as little as possible with the progress of the scientific work carried out at the hospital.

THE International Congress of the Prehistoric and Protohistoric Sciences, which met in London the first week in August, before its adjournment adopted a number of resolutions. It was proposed to organize research committees to clear up the relations between the Aegean world and the Balkan and Danubian countries; and to study the civilization of the western Mediterranean. The composition of an international vocabulary of technical terms was entrusted to Professor Childe, of Edinburgh, with the cooperation of all countries represented in the congress, and the organizing committee of the next congress was invited to see whether it was possible to present a brief report on the systems of classification adopted by different schools of archeology. The principal resolution was an expression on behalf of the congress of deep regret at the attitude of the Department of Antiquities of the Egyptian Government in putting obstacles in the way of the scientific study of Egyptian prehistory. While expressing their respect for the rights of the Egyptian nation to preserve and to arrange these documents upon their origins, the congress requested the Egyptian Government to ensure that prehistoric finds were administered in a really scientific fashion, so that the collections might become and remain accessible for specialized study. They asked in particular that measures should be taken to avoid the dispersion of prehistoric finds the scientific study of which depended upon the solidarity of the material, regardless of this aspect of their scientific value. They asked finally that no obstacles should be placed in the way of their temporary examination abroad by specialists.

NATIONAL standards for all phases of the technical equipment and operation of the motion-picture industry, from the lighting and acoustics of studios to the projectors and screens of picture houses, have been requested by the Society of Motion Picture Engineers. In a letter to the American Standards Association made public by Dr. P. G. Agnew, secretary of the association, Alfred N. Goldsmith, vice-president of the Radio Corporation of America and president of the Society of Motion Picture Engineers, asks for the development of uniform national standards to avoid the danger of confusion and waste resulting

from the establishment of conflicting standards by different groups within the industry. If the request of the society is approved, a technical committee representing all branches of the industry will be organized under the procedure of the American Standards Association.

THE Federal forest research work in the Lake States region, carried on by the Lake States Forest Experiment Station of the University of Minnesota, in cooperation with the university, has been expanded by the establishment of three field laboratories, with a total of approximately 5,400 acres and located within the Chippewa and Superior National Forests. One of these laboratories is to be known as the Cutfoot Experimental Forest, situated about 24 miles from Deer River and well stocked with growing timber, mainly Norway and jack pine. The second is the Pike Bay Experimental Forest, approximately six miles from Cass Lake, and is predominantly an aspen hardwood type. The third is the Kawishiwi Experimental Forest of 2,635 acres, about thirteen miles from Ely, and representing a distinctive region, including the jack pine, black spruce and aspen types.

DISCUSSION

OBSERVATIONS WITH THE RIFE MICROSCOPE OF FILTER-PASSING FORMS OF MICROORGANISMS

RECENTLY, I reported to the staff of the Mayo Clinic the more important observations made during three days, July 5, 6 and 7, 1932, spent in Dr. Kendall's laboratory at Northwestern University Medical School, Chicago. I went there at the invitation of Drs. Kendall and Rife, to share with them their observations in a restudy of the filter-passing forms of *Eberthella typhi* as seen with an improved model of the Rife microscope. They asked me also to bring with me my cultures of the streptococcus from poliomyelitis.

I would like to repeat here that portion of my report which had to do specifically with the Rife microscope.

Owing to the novel and important character of the work, each of us verified at every step the results obtained. Microscopic examinations of suitable specimens was made as a routine by Dr. Rife with his high-power microscope, by Dr. Kendall with the oil immersion dark field, and by myself with the ordinary Zeiss microscope equipped with a 2 mm apochromatic oil immersion lens and × 10 ocular giving a magnification of about 900 diameters. Most observations with the Rife microscope were made at 8,000 diameters. In order to check the magnification, gram and safranin stained films of cultures of *Eberthella typhi,* of the streptococcus from poliomyelitis, and stained films of blood, and of the sediment of the spinal fluid from a case of acute poliomyelitis, were examined. Bacilli, streptococci, erythrocytes, polymorphonuclear leukocytes and lymphocytes were clearly seen, and in each instance were, as nearly as could be estimated, about nine times the diameter as when examined with the 2 mm oil immersion at about 900 diameters.

The following principles and methods were stated by Dr. Rife as being essential in order to visualize clearly the objects at this and higher magnifications by direct observation. Spherical aberration is reduced to the minimum and magnification greatly increased by using objectives in place of oculars. Proper visualization, especially of unstained objects, is obtained by the use of an intense beam of monochromatic polarized light created by rotating wedge-shaped quartz prisms placed between the source of light and the substage quartz condenser. Dispersion of the transmitted rays of light, as they pass upward to the eye, is prevented by passing them through a series of quartz erecting (90°) prisms. Projection of the rays of light through air is not greater than 30 mm at any point.

In my original report[1] I summarized as follows:

There can be no question of the existence of the filterable turquoise blue bodies of *Eberthella typhi* described by Kendall. They are not visible by the ordinary methods of illumination and magnification, not because they are too small, but rather, it appears, because of their peculiar non-staining hyalin structure. Their visualization under the Rife microscope is due to the ingenious methods employed rather than to excessively high magnification. Examination under the Rife microscope of specimens, containing objects visible with the ordinary microscope, leaves no doubt of the accurate visualization of objects or particulate matter by direct observation at the extremely high magnification (calculated to be 8,000 diameters) obtained with this instrument.

The findings under the Rife microscope of cocci and diplococci in filtrates of cultures of the streptococcus from poliomyelitis, and in filtrates of the viruses of poliomyelitis and herpes encephalitis, not detectable by the ordinary methods of examination, and which resembled in form and size those found in the respective cultures, and the absence of minute forms, suggest that the filterable, inciting agent of these diseases is not necessarily extremely small, as is universally believed. Indeed, the filterable, inciting agent may be the non-staining, highly plastic, hyalin

[1] Proc. Staff Meeting Mayo Clinic, 7: 408–413 (July 13), 1932.