the World War, Dr. Jewett continued his services with the American Telephone and Telegraph Company, and also worked for the Bell Telephone Company, and the Western Electric Company. During his association with the latter company, many of the most important advancements in the fields of communications were made. These included the development of the vacuum tube, improvements in the art of inductive loading, building of the transcontinental telephone lines, development of the telephone repeater, introduction of machine switching on a large scale by the Bell System, and the development of high speed submarine telegraph cable. As an engineer, Dr. Jewett had a large share in all of these developments, and as an executive he helped to weld diversified units of the Bell System into a well balanced and efficient whole.

In regard to Dr. Kettering:

After graduation Mr. Kettering spent seven years with the National Cash Register Company. He then became associated with the Dayton Engineering Laboratories Company, which was manufacturing one of his inventions, the Delco starting, lighting and ignition system for automobiles, which is now used all over the world. In 1916 Mr. Kettering established his own laboratory at Dayton, Ohio. In 1920 this was taken over by the General Motors Corporation and combined in 1925 with other research operations in Detroit. This group of engineers and scientists now function under his supervision.

Mr. Kettering's genius and ability enabled him to contribute in many ways to the electrical, mechanical and aeronautical divisions of service during the war. He has been the recipient of many honors from various colleges and universities, and has always been foremost in encouraging scientific and educational societies and groups.

SCIENTIFIC NOTES AND NEWS

DR. THOMAS PARRAN, JR., was nominated on March 23 by President Roosevelt as Surgeon General of the Public Health Service, to succeed Dr. Hugh S. Cumming, who retired on February 1. Dr. Parran has been since 1917 an Assistant Surgeon General of the Public Health Service, from which post he has been on leave since early in 1930 to enable him to fill the position of New York State Commissioner of Health.

THE medal of the American Institute of Chemists, presented annually for distinguished service to the science of chemistry or the profession of chemist in America, has been awarded this year to Dr. Marston Taylor Bogert, professor of organic chemistry at Columbia University. The award is made in recognition of Dr. Bogert's "outstanding service as a teacher and as an investigator in the field of organic chemistry." Last year the award went to Dr. James Bryant Conant, president of Harvard University. Past medalists include Andrew W. Mellon and Richard B. Mellon, honored for establishing the Mellon Institute for Industrial Research; the late George Eastman, who made fine organic chemicals available to the chemists of the country; Mr. and Mrs. Francis P. Garvan, who established the Chemical Foundation; Dr. H. C. Sherman, for his food researches, and Dr. Charles H. Herty, paper chemist. The medal will be presented to Dr. Bogert at the annual dinner of the institute to be held in Buffalo on May 9.

IN connection with the opening on March 31 of a series of scientific lectures given under the auspices of the Eldridge Reeves Johnson Foundation for Research in Medical Physics at the University of Pennsylvania, honorary degrees were conferred on Dr. Joseph Erlanger, professor of physiology at Washington University, St. Louis, and Dr. Herbert Spencer Gasser, director of the laboratories of the Rockefeller Institute for Medical Research.

THE senatus of the University of Edinburgh has voted to confer the doctorate of laws on Dr. Edward L. Thorndike, director of the Institute of Educational Research of Teachers College, Columbia University.

DR. ROSS G. HARRISON, Sterling professor of biology at Yale University, has been elected a corresponding member of the Bavarian Academy of Sciences.

CAPTAIN LUCIUS W. JOHNSON, of the Navy Medical Corps, and Dr. Edward R. Baldwin, of Saranac Lake, N. Y., will receive the 1936 awards of the Kober Foundation of Georgetown University. Captain Johnson, plastic surgeon, was the choice of the executive committee of the Association of Military Surgeons, as the Kober lecturer for the year. Dr. Baldwin was selected by the Association of American Physicians as the Kober medalist. He is director of the Trudeau Foundation at Saranac Lake.

THE Loder Rhododendron Cup for the year 1936 has been conferred by the Royal Horticultural Society of London on Alfred Rehder, associate professor of dendrology at Harvard University and curator of the Herbarium of the Arnold Arboretum.

A BILL has been passed in the Senate to authorize award of the Distinguished Flying Cross to Lincoln Ellsworth for his recent 2,500-mile flight across an unexplored part of the Antarctic.

DR. RUDOLPH MATAS, emeritus professor of surgery at Tulane University, was the guest of honor on March 19 at the annual dinner of the New Orleans Chapter of the American Red Cross.

AT the recent meeting of the Alabama Academy of

Sciences, presided over by Dr. Walter B. Jones, state geologist, Dr. Roger Allen, of Auburn, was elected president. Professor J. R. Cudworth, director of the State Bureau of Mines Experiment Station at the university, was named vice-president in charge of the section on geology, anthropology and archeology, and Dr. Septima Smith was reelected secretary. The academy grant for research, given annually by the American Association for the Advancement of Science, was presented to Dr. Septima Smith.

Nature reports that at the annual general meeting of the Geological Society of London, the following officers were elected for 1936–37: *President,* Professor O. T. Jones; *Vice-presidents,* J. F. N. Green, Professor H. L. Hawkins, Professor W. J. Pugh, Professor H. H. Swinnerton; *Secretaries,* Professor W. T. Gordon, Dr. L. Hawkes; *Foreign Secretary,* Sir Arthur Smith Woodward; *Treasurer,* F. N. Ashcroft.

PROFESSOR WESLEY B. HALL, of the department of electrical engineering of Yale University, has resigned to become head of the department of electrical engineering at the Rhode Island State College. He succeeds the late William A. Anderson, whose death occurred last December.

APPROVAL by the Board of Education of Detroit of the appointment of Dr. Raymond B. Allen, associate dean of the Columbia University Medical School and associate director of the New York Post-Graduate Medical School and Hospital, to the position of dean of the College of Medicine of Wayne University, Detroit, Mich., has been announced by Dr. Frank Cody, president of the university and superintendent of schools.

DR. ERIC OLDBERG, acting head of the department of surgery at the College of Medicine of the University of Illinois, has been appointed professor and head of the new department of neurology and neurological surgery.

THE University of Rochester has announced the appointment of Frederick L. Hovde, assistant professor of chemistry at the University of Minnesota, a former athlete and Rhodes scholar, to organize and direct its new scholarship program. Under the plan the university will establish 120 scholarships with maximum yearly grants of $500 for exceptional students from all over the country.

DR. F. H. BAKER, Lowndean professor of astronomy and geometry at the University of Cambridge, who will retire at the end of the academic year, will be succeeded by W. V. D. Hodge, lecturer in mathematics and fellow of Pembroke College.

FRED D. BUTCHER, entomologist and plant disease specialist of the North Dakota Agricultural College Extension Service, has been appointed associate entomologist in the Bureau of Entomology of the U. S. Department of Agriculture, where he will specialize on grasshopper control work.

DR. ERNST SCHAFFNIT, editor of *Pflanzen Krankheiten,* who recently retired as director of the Institute of Plant Industry at Bonn, will spend a year at University Farm, University of Minnesota, as an honorary fellow, giving lectures and carrying on research work in plant physiology and plant pathology.

THE Board of Trustees of the Rockefeller Institute for Medical Research announces the election of Dr. Walter Bradford Cannon and Dr. George Hoyt Whipple as members of the Board of Scientific Directors.

DR. A. C. SEWARD, professor of botany and master of Downing College, University of Cambridge, has been appointed a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research.

DR. ALDO CASTELLANI, of the Royal Italian Medical Corps, member of the faculty of the School of Medicine of the Louisiana State University, will not give his annual lectures at the Medical School this spring. Dr. Castellani is commander-in-chief of the Italian Medical Corps and must remain close to the Ethiopian situation until the war is ended.

DR. ENRICO FERMI, professor of theoretical physics at the University of Rome, member of the Royal Academy of Italy, will be a member of the faculty of the summer school of Columbia University. He will direct work in the department of physics on nuclear phenomena, natural and artificial radioactivity and the transmutation of nuclei.

DR. ROBERT T. HATT, director of the Cranbrook Institute of Science, Bloomfield Hills, Mich., and Mrs. Hatt have returned from a survey of physical and educational equipment in fifty-two museums of England, Holland, Germany and France, preparatory to the planning of exhibits and laboratories for the projected building of the Cranbrook Institute of Science.

DR. OTIS W. CALDWELL, general secretary of the American Association for the Advancement of Science, delivered the principal address on the evening of March 20 at the eighty-third annual meeting at Tulane University of the New Orleans Academy of Science. Dr. Caldwell spoke on "Popular Notions and Modern Science."

PROFESSOR EMERITUS DANIEL WEBSTER HERING, curator of the James Arthur collection of clocks and watches, who has been for fifty years a member of the faculty of New York University, delivered the fifth

annual James Arthur Lecture on "Time and Its Mysteries" on April 2. The title of his lecture was "The Time Concept and Time Sense Among Cultured and Uncultured Peoples." Previous lecturers have been Dr. Robert Andrews Millikan, Dr. John Campbell Merriam, Professor Harlow Shapley and the late Dr. James Henry Breasted.

DR. GEORGE W. CORNER, professor of anatomy in the School of Medicine and Dentistry of the University of Rochester, has been appointed Thomas Vicary lecturer for 1936 of the Royal College of Surgeons of England. The lecture, which will deal with a subject in the history of anatomy or surgery, will be given in December next. In connection with his proposed visit to London Dr. Corner will also deliver by invitation a series of four lectures under the auspices of the University of London and of Guy's Hospital Medical School on the physiology of the ovarian hormones.

DR. CHARLES C. COLBY, professor of geography at the University of Chicago, recently gave a lecture on "Science in Regional Planning" before the Senior Research Group of the Tennessee Valley Authority, not six lectures as previously reported.

FREE public lectures on "The Relation of Science to Human Welfare" will be given from April 7 to 10 by the Institute of Public Affairs of the Vanderbilt Student Union. The following lectures are announced on the preliminary program: "The Changing Picture of the Universe," by Professor Frederick Slocum, Wesleyan University; "The Responsibilities and Limitations of Science toward Human Affairs," by President J. C. Merriam, the Carnegie Institution of Washington; "Economic Effects of Paper Manufacture from the Southern Pine," by Dr. Charles H. Herty, director of the Savannah Pulp and Paper Laboratory, and "Science and Common Sense in Modern Physics," by Dr. W. F. G. Swann, director of the Bartol Research Foundation of the Franklin Institute. Following the lecture on April 7 there will be demonstrations of the research, facilities and equipment in the Vanderbilt Medical School, and following the lecture on April 9 there will be demonstrations in the Vanderbilt Engineering School and in certain other scientific departments of the university.

THE twelfth scientific session of the American Heart Association will be held on May 12 from 9:30 A. M. to 5:30 P. M., at Hotel Phillips, Kansas City, Mo. The program will be devoted to cardiac insufficiency.

THE first meeting of the psychologists of the State of Oregon was held at the University of Oregon, on February 28 and 29, under the chairmanship of Professor Howard R. Taylor. Two sessions were held, one devoted to the teaching of elementary psychology, the other to a discussion of research projects. On Friday evening after an informal dinner, Dr. Gesell's sound film "Life Begins" was presented. Professor William Griffith, of Reed College, was designated chairman for the meeting to be held next year at Reed College. Dr. Calvin S. Hall, of the University of Oregon, was elected secretary.

ARRANGEMENTS have been completed for the meeting of the American Pharmaceutical Association and affiliated organizations in Dallas, Texas, during the week of August 24 to 29. At this time, the Texas Centennial Exposition will be in full operation. Walter D. Adams will serve as local secretary for the meeting and Sam P. Harben as chairman of the committee on arrangements.

THE fifteenth International Congress of Medical Hydrology, Climatology and Geology will be held at Belgrade in October. Further information can be obtained from Professor Milontine Neskovitch, 3 rue Takowska, Belgrade.

THE second International Congress of the Scientific and Social Campaign against Cancer will be held in Brussels from September 20 to 26. The congress is under the patronage of the King of the Belgians and of Queen Elizabeth. The program has been divided into two main groups, embracing the scientific campaign and the social campaign against cancer. Further particulars may be obtained from M. W. Schraenen, general secretary to the congress, 13, Rue de la Presse, Brussels, Belgium.

THE formation of a section of microchemistry, with Professor A. A. Benedetti-Pichler, of Washington Square College, New York University, as chairman, is announced by the American Chemical Society. In adding the new group to its network of professional units, the society, according to the announcement, "accords official recognition to a young branch of science which is influencing practically every field of chemistry and biology." These units, through which organized chemistry in America functions, now number nineteen, and enroll nearly 20,000 chemists representing every major sphere of chemical science. The microchemical section, initiated chiefly through the efforts of New York members, will bring into association several hundred research workers from all parts of the country. It will convene for the first time at the ninety-first meeting of the society in Kansas City, Mo., to be held from April 13 to 17.

THREE special committees, appointed by Dr. S. C. Lind, director of the School of Chemistry of the University of Minnesota, who was recently elected director of the new Institute of Technology at the university,

have begun a study of methods of combining entrance requirements in its three branches to go into effect next autumn. The Institute of Technology is composed of the College of Engineering and Architecture, the School of Chemistry and the School of Mines and Metallurgy. M. Cannon Sneed, chief of the division of inorganic chemistry, is chairman of the committee on registration, entrance requirements and curriculum for first-year students. Other members of the committee are Professor Elting H. Comstock, of the mines faculty; Robert W. French and I. W. Geiger, associate professors of drawing and chemistry, respectively, and Charles A. Koepke, associate professor of mechanical engineering. Professor Geiger; W. E. Brooke, head of the department of mathematics and mechanics; Howard D. Myers, associate professor of engineering; Professor W. T. Ryan, electrical engineering, and Professor Comstock will study entrance requirements. Chairman of the group studying a common curriculum for all first-year students in the institute is Professor W. H. Kirchner, head of the department of drawing and descriptive geometry. Others are Professor Comstock; Henry C. Eggers, assistant professor of drawing; F. M. Mann, head of the School of Architecture, R. E. Montonna, associate professor of of chemical engineering; Professor John R. DuPriest, head of the department of mechanical engineering, and Dean Ora M. Leland, of the College of Engineering and Architecture.

Nature states that two British expeditions to observe the total eclipse of the sun on June 19 are leaving for sites selected from which to observe the eclipse. The path of the total eclipse stretches from Greece over Siberia to the Pacific Ocean. An expedition led by Professor F. J. M. Stratton, of the Solar Physics Observatory, Cambridge, will station itself in northern Japan. The program of eclipse observations consists chiefly of observations of intensities of lines in the flash spectrum; despite the vigorous growth of the technique of spectrophotometry in the last decade, very few spectrophotometric observations have been made on eclipses, chiefly on account of the ill-luck through cloud which has attended recent expeditions. The second British expedition will be led by Professor J. A. Carroll, of the University of Aberdeen, and will proceed to a site in the U.S.S.R. where the eclipse will take place near midday.

DISCUSSION

OBSERVATIONS ON THE CULTIVATION OF POLIOMYELITIS VIRUS

IT is stated generally and is to some extent accepted as a fact that filterable viruses can not be cultivated on ordinary lifeless media. While many of these ultramicroscopic forms have been observed to multiply in vitro in the presence of living susceptible cells or in modified tissue culture media, these successes seem to build all the more solidly on the postulate that the viruses are probably obligate parasites. The characteristics, distinguishing peculiarities and the techniques required for the demonstration and study of viruses and their behavior have been described fully by Rivers[1] and collaborators in this country and by Bedson[2] and associates in England. On the basis of their findings one is compelled to accept as a dictum—no virus multiplication without the presence of viable or susceptible cells or tissue in a culture medium.

Of particular interest in this connection are the reports of a few investigators who brought forth evidence which was at variance with the definition of a virus, notably regarding its requirements for actual multiplication outside the animal body. Eagles and McClean,[3] working with vaccine virus, claimed to have cultivated the virus in a "cell-free" medium containing extract of rabbit kidney tissue, serum and Tyrode's solution. Rivers and Ward[4] were unable to confirm these results and succeeded shortly afterward in establishing the correctness of the observations of Maitland[5] and coworkers, who had previously shown that it was possible to accomplish this only in the presence of minced kidney tissue. It followed from subsequent studies by Rivers[6] that splenic and testicular tissue could also supply the necessary elements for growth of vaccine virus. Eberson,[7] in an attempt to cultivate the virus of poliomyelitis in a medium containing

[1] T. M. Rivers, The Harvey Lectures, 1933–34, Baltimore, Williams and Wilkins Company; *Pennsylvania Med. Jour.*, April, 1933; *Am. Jour. Med. Sci.*, 190: 435, 1935; Rivers' Filterable Viruses, 1928, Baltimore, Williams and Wilkins Company; *Jour. Exp. Med.*, 52–60, 1930–35.

[2] S. P. Bedson, *Brit. Jour. Exp. Path.*, 8: 470, 1927; 11: 502, 1930; 13: 65, 1932; 14: 267, 1933; 15: 243, 1934; *Newcastle Med. Jour.*, 15: 55, 105, 1935; *The Lancet*, 1277, December 7, 1935.

[3] G. H. Eagles and D. McClean, *Brit. Jour. Exp. Path.*, 11: 337, 1930; 12: 97, 1931; see also G. H. Eagles and A. H. H. Kordi, *Proc. Roy. Soc. London*, Series B, 111: 329, 1932.

[4] T. M. Rivers and S. M. Ward, *Jour. Exp. Med.*, 57: 51, 1933.

[5] H. B. Maitland and M. C. Maitland, *Lancet*, 2: 596, 1928; *Brit. Jour. Exp. Path.*, 11: 119, 1930; 13: 90, 1932.

[6] T. M. Rivers and S. M. Ward, *Jour. Exp. Med.*, 57: 741, 1933.

[7] F. Eberson, *Proc. Soc. Exp. Biol. and Med.*, 29: 477, 1932; SCIENCE, 75: 519, 1932; *Proc. Soc. Exp. Biol. and Med.*, 30: 92, 1932; *Jour. Lab. and Clin. Med.*, 18: 565, 1933; *Jour. Immunol.*, 24: 433, 1933.