work in the eradication of *Anopheles gambiae* in Brazil."

At this meeting General Simmons was chosen president-elect of the American Society of Tropical Medicine.

AWARD OF THE PERKIN MEDAL

THE Perkin Medal for 1944 of the American Section of the Society of Chemical Industry has been awarded to Dr. Elmer K. Bolton, of Wilmington, Del., chemical director of E. I. du Pont de Nemours and Company.

Presentation of the medal, conferred annually for outstanding achievement in industrial research, will be made on the evening of January 5, at a joint meeting, held at the Hotel Commodore, New York City, of the Society of Chemical Industry, the American Chemical Society, the American Institute of Chemical Engineers, the Electrochemical Society and the Société de Chimie Industrielle.

According to the citation, the medal is conferred on Dr. Bolton in recognition of

leadership in the synthesis of the first general purpose synthetic rubber to be developed either in this country or abroad, and for his direction of nylon research.

His undertaking in 1925 of a search for a practical synthetic rubber, in spite of previous repeated failures, emphasizes his vision and boldness as a research director. Through his persistent stimulation and guidance, this search culminated in the commercial manufacture of chloroprene synthetic rubber, commonly known as neoprene, which to-day is a key product in the national synthetic rubber program.

A broad program to explore the fundamentals of polymerization phenomena was undertaken by the chemical department of the du Pont Company in 1928 under the late Dr. Wallace H. Carothers. In the course of these studies synthetic polyamides were discovered, and under Dr. Bolton's direction the development of nylon as a new and revolutionary commercial textile fiber was brought to successful fruition.

Dr. Bolton is the thirty-ninth recipient of the Perkin Medal, which was founded in honor of Sir William Henry Perkin, whose experiments led to his discovery of aniline dyes and the foundation of the aniline dye industry. He joined the staff of the du Pont Company at the Wilmington Experiment Station in 1915. In 1916, he was placed in charge of a group of chemists to study the preparation of synthetic dyes, for which America was at that time largely dependent upon Germany. Dr. Bolton became director of the chemical section of the du Pont dyestuffs department in 1921, assistant chemical director of the du Pont Company in 1929, and chemical director in 1930.

SCIENTIFIC NOTES AND NEWS

THE doctorate of laws was conferred on Dr. Robert A. Millikan, chairman of the executive council of the California Institute of Technology, on November 20 on the occasion of the annual Achievement Day celebration of William Jewell College, at which he made the principal address.

THE degree of doctor of laws was conferred on Dr. Robert Chambers, of New York University, by Queens University, Kingston, Canada, his alma mater, at the October convocation of the university.

COLONEL LEONARD G. ROWNTREE, director of the Philadelphia Institute for Medical Research, chief of the medical division of the National Headquarters Selective Service System, has received the scroll of honor of the New York State Committee on Physical Fitness, in recognition of his "interest, understanding and efforts in behalf of the physical fitness of a nation at war and the welfare of the youth of the future."

THE Medal for the Advancement of Research of the American Society of Metals has been awarded to Robert Crooks Stanley, chairman and president of the International Nickel Company of Canada, in recognition of "pioneering leadership in the field of metals research." The Henry Marion Howe Medal for the best paper to appear in the *Transactions* of the society was presented at the annual dinner of the society to Earnshaw Cook, chief metallurgist; J. A. Fellows, assistant chief metallurgist, and R. A. Flinn, assistant metallurgist, all members of the staff of the metallurgical laboratory at Mahwah, N. J., of the American Brake Shoe Company. The paper described a quantitative study of the transformation reaction of steel from high to low temperatures in heat-treating practices.

AT the eighty-sixth commencement exercises on September 28 of the Long Island College of Medicine, the first alumni medal for distinguished service to American medicine was presented to Dr. Robert L. Dickinson, gynecologist, who graduated from the college in the class of 1882.

THE Captain Joseph H. Linnard Prize of the Society of Naval Architects and Marine Engineers was presented at the fifty-second annual banquet of the society to Professor C. Richard Soderberg, professor of mechanical engineering at the Massachusetts Institute of Technology, and to Ronald B. Smith, director of research and development of the Elliott Company, Jeannette, Pa., on November 17. The award was presented jointly for a paper entitled "The Gas Turbine as a Possible Marine Prime Mover," selected as

the best technical paper contributed to the society during 1943.

THE Order of the Sun of Peru in the class of Knight Commander has been conferred by the President of Peru upon Dr. J. C. Geiger, director of public health of the City and County of San Francisco, clinical professor of epidemiology at the University of California.

DR. ANDREW C. IVY, Nathan Smith Davis professor of physiology at the Northwestern University Medical School, will deliver on December 5 the presidential address at the twenty-ninth annual meeting of the Institute of Medicine of Chicago. His address is entitled "Contributions to Survival on a Raft at Sea."

DR. W. H. COOLIDGE, head of the department of chemistry in Kenyon College, will serve during the winter term as visiting lecturer at Denison University; Dr. H. F. Strohecker, of the department of biology, will conduct courses in anatomy at Wayne University.

WILLIAM J. BAUMGARTNER, professor of zoology at the University of Kansas, having reached the age limit, has retired after forty years of service. He plans to continue his research and editorial work at the university.

DR. JOSEPH D. KELLY, of the Manhattan Eye, Ear and Throat Hospital, has been appointed professor and chairman of the department of otorhinolaryngology of the New York University College of Medicine.

DR. JESSE E. HOBSON, head of the department of electrical engineering of the Illinois Institute of Technology, has been appointed director of the Armour Research Foundation of the institute to succeed Harold A. Vagtborg, who on January 1 will become president of the Midwest Research Institute in Kansas City.

DR. HOWARD C. HOPPS, of the School of Medicine of the University of Chicago, has been appointed professor of pathology and chairman of the department of the School of Medicine of the University of Oklahoma. He succeeds Dr. Louis Alvin Turley, who has retired with the title emeritus.

DR. J. DOUGLAS REID, associate professor of bacteriology and parasitology at the Medical College of Virginia at Richmond, has been appointed acting head of the department. He succeeds Dr. Frederick W. Shaw, who was recently appointed research professor of bacteriology.

AT Iowa State College Dr. Alexander M. Mood, who has been working at a special Navy project at Princeton University, formerly a member of the faculty of the American University, has been appointed associate professor in the department of statistics.

PROFESSOR H. T. FLINT has become Hildred Carlile professor of physics at the University of London. He succeeds Professor W. Wilson, who has served since 1921.

A. V. WILLIAMSON, reader in geography, has been elected to the newly established chair of geography at the University of Leeds.

THE University of Liverpool has established a professorship of child welfare with Professor N. B. Capon as the first incumbent.

DR. GEORGE A. ZENTMYER, assistant plant pathologist at the Agricultural Experiment Station at New Haven, Conn., has resigned to accept a similar position at the Citrus Experiment Station of the University of California. He succeeds the late William T. Horne.

DR. FRANK B. JEWETT, president of the National Academy of Sciences, has retired as chairman of the board of the Bell Telephone Laboratories. His address is Care of the National Defense Research Committee, Room 6517, 350 Fifth Avenue, New York 1, N. Y.

DR. VIRGIL P. W. SYDENSTRICKER, professor of medicine at the School of Medicine of the University of Georgia, has been given leave of absence for six months to enable him to accept a commission with the rank of colonel as chief counsel in the nutrition of western Europe of the United Nations and Rehabilitation Administration. He will have charge of organizing the health service of the nations west of the Balkans that have been freed from German control.

DR. ROBERT B. WOODWARD, of Harvard University, will address the New York Section of the American Chemical Society on the evening of December 8 at a meeting to be held at the School of Education of Washington Square College, New York University. His subject will be "The Total Synthesis of Quinine."

BRIGADIER JOHN RAWLINGS REES, consulting psychiatrist to the British Army, on November 20, 21 and 22 delivered the Salmon Lectures for 1944 at the New York Academy of Medicine. The general title of the lectures was "The Shaping of Psychiatry by War."

DR. F. J. W. ROUGHTON, fellow of Trinity College and fellow of the Royal Society of London, has been working in the United States on aero-medical problems. He recently delivered a lecture at the University of California on "Some Recent Work on Carbon Monoxide as a Poison and a Physiological Tool."

DR. JAMES HILLIER, research engineer of the laboratories at Princeton, N. J., of the Radio Corporation of America, has been elected president of the Electron Microscope Company of America.

DR. ARTHUR C. BATES, consulting engineer, assistant professor of mechanical engineering at Lehigh University, has been appointed chief engineer of the Roller-Smith Division of the Realty and Industrial Corporation, Bethlehem, Pa.

THE American-Scandinavian Foundation has announced that the Nobel Prizes will be presented at a luncheon to be held on December 10 at the Waldorf Astoria, New York. As already announced in SCIENCE the recipients are Dr. Henrik Dam and Dr. E. A. Doisy, for their work on vitamin K; Dr. Joseph Erlanger and Dr. H. H. Gasser, director of the Rockefeller Institute for Medical Research, for their work on nerves, and Dr. I. I. Rabi and Dr. Otto Stern, for the results of their study of the structure of the atom. The presentations will be made in behalf of King Gustav V by Wollmar F. Bostroem, Minister from Sweden. This will be the first time that Nobel Prizes have been presented in the United States.

THE regular October meeting of the American Mathematical Society was held at Columbia University, New York City, on October 28. Professor Gordon Pall, of McGill University, gave an address entitled "The Arithmetical Invariants of Quadratic Forms." Twenty-nine research papers were presented to the society, nine in person and twenty by title.

THE University of Pittsburgh held the first of a series of annual research conferences on x-ray and electron diffraction on November 3 and 4. In charge was Dr. Herbert E. Longenecker, dean of research in the natural sciences. Taking part were members of the faculty of the university, of the Carnegie Institute of Technology and of the x-ray and electron diffraction laboratories of the Pittsburgh district. Out of town speakers included Professor W. P. Davey, of Pennsylvania State College, and Professor I. Fankuchen, of the Polytechnic Institute of Brooklyn.

THE Eastern Section of the American Federation for Clinical Research on December 9 will hold a meeting under the presidency of Dr. Orville T. Bailey, of the department of pathology of the Harvard Medical School. A full program of fourteen papers will be presented. Fifteen minutes will be allowed for each paper and five minutes for the discussion following it. All members of the medical profession are invited.

THE sixth annual conference of the Institute of Food Technologists will be held at the Hotel Seneca, Rochester, N. Y., on May 21, 22 and 23, 1945, with food technologists of Western New York as hosts. Arrangements for this conference were considered on November 4 at an afternoon and evening regional conference of the Western New York organization. The program is being arranged by a committee under the chairmanship of Dr. C. O. Ball, of the Research Department of the Owens-Illinois Glass Co., Toledo, Ohio. It will consist of invited papers and addresses to be given during six half-day sessions, at three luncheons and at a banquet. Industrial exhibits showing advances in methods and equipment for food processing are planned. Officers for 1944–45 are *President,* Dr. F. C. Blanck, chief research chemist, H. J. Heinz Company, Pittsburgh; *Vice-president,* Dr. R. H. Lueck, director of research, American Can Company, N. Y., and *Secretary-Treasurer,* Dr. George J. Hucker, New York State Agricultural Experiment Station, Geneva, N. Y.

PLANS for promoting the development of a State Department of Conservation of Utah's Natural Resources were considered by the Division of Biological Sciences and of Applied Biological Sciences at the semi-annual meeting held on October 28 of the Utah Academy of Arts and Sciences at Brigham Young University. A motion was passed recommending that a committee be formed to promote the development of such a department as an aid to research in problems of conservation. Dr. A. M. Woodbury, of the University of Utah, presented a plan for its organization.

THE American Society of Anesthetists met in Houston, Texas, on November 2, and, on November 3, at the Medical Branch at Galveston of the University of Texas. At Galveston there was an exhibit of historical material relating to Horace Wells, who on December 11, 1844, first used nitrous oxide for anesthesia.

AT a recent meeting of the Board of Trustees of Baylor University, tentative building plans were approved for the new building for the College of Medicine to be erected at a cost of $1,000,000 on a twenty-acre site in the Medical Center. The fund is a gift to the college by the M. D. Anderson Foundation, which has also provided the sum of $1,000,000 for research to be used during the next ten years. In addition a gift of $500,000 for the ten-year period has been given by the citizens and business firms of the City of Houston.

THE post-war building plans of Queens College, New York City, include a three-story Z-shaped Science Hall to be erected at a cost of $1,400,000 which will contain sixty-eight rooms, including nine chemical and four geological laboratories. A building for hygiene, on which it is proposed to spend the sum of $450,000, is also planned.

A GIFT of £70,000 has been made to the University of Edinburgh by Sir Robert McVitie Grant to found a chair of dermatology. This is the first chair of its kind to be established in Great Britain.

THE report for 1943–44 of the Committee on Marine Ecology as Related to Paleontology of the Division of Geology and Geography of the National Research Council, of which Dr. Henry S. Ladd is chairman, has been issued in bound mimeographed form.

CHARLES BROTHERTON has given the University of Leeds £1,000 a year for seven years for the establishment of a Brotherton research fellowship in physical chemistry tenable in the department of color chemistry and dyeing; £1,000 a year for seven years for the establishment of a new lectureship in chemical engineering in the department of coal gas and fuel industries, and an additional sum of £1,000 to each of the two departments for the purchase of equipment.

A NEW map of Soviet Russia, the first and only detailed chart of that country with place names in English, has been issued by the National Geographic Society.

DISCUSSION

UTILIZATION OF "PORE SPACES" OF SEMI-PERMEABLE MEMBRANES[1]

DURING the summer of 1941 it was desired to prepare flexible, opaque, but highly reflective, smooth surfaces in order to make a shutter curtain for a reflex type camera without having a separate mirror. Metallic foils were discarded for many reasons, and an attempt was made to deposit metallic silver directly on a flexible plastic.

"Cellophane" was the plastic selected upon which to try the plating process. Several reasons dictated this choice, namely, its flexibility, its relatively great strength in relation to thickness and the ease of obtaining fairly large sheets. The two commonest methods of depositing silver films on glass, *i.e.*, the ammoniated silver nitrate *vs.* acid sucrose process, and the Rochelle salt process, were tried. Silver was deposited when the solutions were poured over the membrane, but the film of metal did not seem to be quite as adherent on the plastic as it is on glass and was entirely too delicate even when protected by a coating of lacquer. The idea was discarded; but later the question came up as to what would happen if the reacting solutions were separated by the membrane. A trial was made, using the ammoniated silver and acid sucrose solutions. A brown deposit began forming in the membrane almost at once, the color depth increasing and gradually changing to a metallic greyish black. At about this point metallic silver (judged by color) began depositing upon both surfaces. The same sequence of events occurred with the Rochelle salt process. Examination of the brown deposit seemed to indicate that it was composed of finely divided metallic silver.

These films with their surface coatings were not satisfactory for the purpose in mind. A third method of obtaining silver films, that is, the one using triethanolamine solution, was tried. In this case, a metallic silver layer was eventually built up that was not on the surface of the membrane. This piece of plastic served admirably as a mirror that would roll up and stand quite a bit of abuse before finally disintegrating.

[1] From the Department of Ophthalmology, Washington University, and the Oscar Johnson Institute.

The foregoing led quite naturally to speculation regarding other metals, and copper was selected as being one of the easiest to deposit. A solution of copper sulfate was separated from a solution of colloidal iron by a membrane. Nothing resulted from this experiment. Then, finely divided metallic iron was substituted for the colloidal suspension and a deposit having a metallic lavender-brown color was formed within the membrane. The particles in this case were very gross and irregular in size, shape and arrangement. The experiments cited led to speculation concerning membranes other than Cellophane and resultants other than metallic deposits.

The author, being interested in photography, selected the photo-sensitive silver salts for the next group of experiments and somewhat more attention was paid to conditions. Half molar solutions were prepared of silver nitrate and of the four halogen sodium salts. Formation of the silver salt was done by covering the bottom of a porcelain-lined developing pan with the silver nitrate solution and laying a large sheet of Cellophane in the pan in such a manner as to prevent direct contact of the sodium salt solution with the silver nitrate. The sodium salt solution was then poured over the Cellophane and a creamy deposit at once began to form within the membrane. The longest practical exposure was roughly thirty seconds, by which time the reaction had proceeded to the exterior layers, and the halogen silver salt made a mass on both surfaces that was adherent and could only be removed with difficulty. The salt-bearing membranes were washed thoroughly in distilled water and dried with some stretching. The Cellophane used in all these experiments came from box wrappings of one sort or another and was so thin that drying had to be done carefully or too much wrinkling occurred. The light-sensitive silver salt membranes were all prepared in the dark-room using a Wratten 'OA' safe light for illumination. After drying, the films were exposed in direct contact with a standard photographic negative for a slightly shorter time than would be used for a "contrast" lantern slide plate. Development was carried out using Eastman's D-72 formula, fixing in Eastman's F-5 acid