

NATIONAL ACADEMY OF SCIENCES

ANNUAL MEETING

THE ninety-first annual meeting of the National Academy of Sciences was held in Washington, D.C., during April 26–28 and was attended by about two hundred of the total of five hundred members that make up the Academy. During the meeting five sessions were devoted to the reading of about forty papers, and in addition there were three symposia of invited papers on the following important fields of current scientific interest: structure and functions of nucleic acids, under the chairmanship of Prof. Linus Pauling (California Institute of Technology); the development and significance of high-energy particle accelerators for nuclear research, under the chairmanship of Prof. I. I. Rabi (Columbia University); and scientific aspects of the International Geophysical Year, under the chairmanship of President Lloyd V. Berkner (Associated Universities, Inc.). Each year the president of a distinguished foreign academy or society is invited to address the Academy, and this year the chief guest of honour and principal speaker was Prof. Per Adolf Geijer, president of the Royal Swedish Academy of Science and formerly director in chief of the Swedish Geological Survey.

At the meeting four awards of the Academy were presented, as follows: *John J. Carty Medal*, to Dr. Vannevar Bush, president of the Carnegie Institution of Washington; *Comstock Prize*, to Dr. William Shockley, of the Bell Telephone Laboratories; *Elliot Medal*, to Prof. Raymond C. Osburn, emeritus professor of zoology, Ohio State University; and the *Public Welfare Medal*, to Dr. Alan Gregg, vice-president of the Rockefeller Foundation.

The Carty Medal, which was established by a group of friends of Dr. John J. Carty when he retired in 1930 from the vice-presidency of the Bell Telephone Laboratories, is awarded at intervals by the Academy for noteworthy and distinguished accomplishments in any field of science coming within the scope and charter of the Academy, without regard to race, nationality or creed. Dr. Bush, who has been president of the Carnegie Institution of Washington since 1939, is distinguished not only for his work as a scientist and engineer but also as an administrator and public servant. In particular, he organized the Office of Scientific Research and Development during the Second World War, which he administered in parallel with his responsibility for the development of the atomic bomb.

The Comstock Prize for advancement of knowledge in electricity, magnetism and radiant energy is awarded every five years from a fund established in 1907 by Cyrus B. Comstock, a member of the Academy. The Prize for 1953 totals four thousand dollars and is awarded to Dr. Shockley "for his pioneering investigations and exposition of electric and magnetic properties of solid materials; in particular for his researches in the conduction of electricity by electrons and holes in semi-conductors". Except for war service, when he was director of research for the anti-submarine warfare operations research group at Columbia University, Dr. Shockley's working career has been at the Bell Telephone Laboratories, which he joined in 1936, and his

researches have led directly to the development of the transistor.

The Elliot Medal, which was established in 1917 by Margaret Henderson Elliot in honour of her father, Daniel Giraud Elliot, is awarded annually for the most meritorious work in zoology or palaeontology published each year. The award to Prof. Osburn this year is in recognition of his work "Bryozoa of the Pacific Coast of America", a comprehensive treatise on this complicated group of marine organisms which are of scientific interest both as living material and in fossil form and as aids to geological dating. Prof. Osburn was appointed professor of zoology and head of the Department in Ohio State University in 1917, retiring in 1942, and during 1945–53 he held the position of research associate on Bryozoa of the Hancock Expeditions of the University of Southern California.

The award of the Public Welfare Medal is made possible by a fund established in 1913 in honour of Marcellus Hartley by his daughter, Mrs. Helen Hartley Jenkins, the purpose of the Medal being "... to mark the appreciation of the National Academy for eminent service to the public, performed without a view to great monetary gains and by methods which, in the opinion of the Academy, are truly scientific". This year's recipient, Dr. Gregg, has been associated with the Rockefeller Foundation since 1919, being successively associate director, Division of Medical Education; associate director of medical sciences; director of medical sciences; and, since 1951, vice-president of the Foundation. Not only through the Foundation but in other capacities as well, Dr. Gregg has actively participated in medical education and research in the United States and abroad; in supporting the promotion of basic research, he has always been a champion of 'risk research'. As chairman of the Committee on Biology and Medicine of the Atomic Energy Commission since its organization, he has effectively guided the direction of its activities in such a way that basic research has prospered equally with other research activities, and at all times he has stood for freedom in research activities and open interchange of knowledge whenever such freedom and interchange do not jeopardize national security.

The following were elected officers of the Academy: *President*, Dr. Detlev W. Bronk, president of the Rockefeller Institute for Medical Research, New York City; *Foreign Secretary*, Dr. John G. Kirkwood, director of the Sterling Chemistry Laboratory, Yale University; *New Members of Council*, Prof. Farrington Daniels, Department of Chemistry, University of Wisconsin, and Dr. Merle A. Tuve, director of the Department of Terrestrial Magnetism, Carnegie Institution of Washington. The other officers of the Academy, who were elected in previous years and will continue until the expiry of their term of office, are as follows: *Vice-President*, Dr. George W. Corner; *Home Secretary*, Dr. Alexander Wetmore; *Treasurer*, Dr. William J. Robbins; *Members of Council*, Hugh L. Dryden, Robert F. Loeb, William W. Rubey, Wendell M. Stanley and Edwin B. Wilson.

The following have been elected members of the Academy: E. Anderson, professor of botany, Washington University, St. Louis; H. W. Babcock, astronomer, Mount Wilson Observatory, Pasadena; E. C. Bain, vice-president in charge of research and technology, United States Steel Corporation, Pittsburgh; A. K. Balls, professor of enzyme chemistry, Purdue University; J. Bardeen, professor of physics and electrical engineering, University of Illinois; W. Bloom, professor of anatomy, University of Chicago; M. N. Bramlette, geologist, Scripps Institution of Oceanography, La Jolla; W. R. Brode, associate director, National Bureau of Standards, Washington, D.C.; M. Calvin, professor of chemistry, University of California, Berkeley; B. Chance, director of the Johnson Foundation, University of Pennsylvania; R. P. Feynman, professor of theoretical physics, California Institute of Technology, Pasadena; H. O. L. Fischer, professor of biochemistry, University of California, Berkeley; J. B. Fisk, director of research in the physical sciences, Bell Telephone Laboratories, Murray Hill, N.J.; J. P. Guilford, professor of psychology, University of Southern California, Los Angeles; N. Jacobson, professor of mathematics, Yale University; G. E. Kimball, professor of chemistry, Columbia University; W. E. Lamb, professor of physics, Stanford University; E. M. Landis, professor of physiology, Harvard Medical School; E. Mayr, professor of zoology, Harvard University; W. F. Meggers, chief of the Spectroscopy Section, National Bureau of Standards, Washington, D.C.; A. E. Mirsky, member of the Rockefeller Institute for Medical Research, New York; B. O'Brien, vice-president, American Optical Company, Southbridge, Mass.; W. K. H. Panofsky, professor of physics, Stanford University; A. Petrunkevitch, professor emeritus of zoology, Yale University; A. R. Rich, professor of pathology, School of Medicine, Johns Hopkins University; J. H. Steward, professor of anthropology, University of Illinois; E. H. Vestine, chairman of the Section on Statistical and Analytical Geophysics, Department of Terrestrial Magnetism, Carnegie Institution of Washington; F. H. Westheimer, professor of chemistry, University of Chicago; R. H. Wetmore, professor of botany, Harvard University; A. E. Whitford, professor and director, Washburn Observatory, University of Wisconsin.

The following have been elected foreign associates of the Academy: Sir Macfarlane Burnet, director of the Walter and Eliza Hall Institute for Medical Research, Melbourne; Albert M. G. R. Portevin, consulting engineer, Paris; and Otto Renner, professor and head of the Botanical Institute and Garden, Munich.

REACTIONS OF THE HUMAN BODY TO INJURY

THE British Council has done good service to a serious student of disease by bringing together* a number of articles which show very clearly the changing attitude to injury reactions. No longer can this topic be considered as the sole province of pathology. Indeed, it is all too clear that no progress need be expected unless the attack be planned on the widest possible front. The chemist and physicist,

the clinician, bacteriologist and pathologist must each play his part in the study of what goes on in the injured tissues and of the factors that modify the responses until death or recovery occurs. This re-birth of the old doctrine of inter-relationship between constitutional factors and local tissue response owes a great deal to Sir Edward Mellanby, until lately secretary of the Medical Research Council and himself an original investigator in the field, and it was a felicitous thought to persuade him to write the introduction to the British Council's symposium.

Prof. G. Payling Wright tells a fascinating story about tetanus which is largely the outcome of his own recent work. Ingenious experiments have shown how the toxin of this unpleasant germ reaches the central nervous system and exerts its effects at the synapses of the spinal cord. Prof. Wright indicates how infection may be prevented and pleads for general immunization of the young.

Under the title of "Gas Gangrene", Prof. C. L. Oakley reviews the present-day knowledge of anaerobic infections. His masterly exposition of their genesis shows that changes in oxidative reduction potentials, pH requirements and various other disturbances in damaged muscle provide ideal conditions for the nourishment and growth of anaerobic bacteria. The various toxins manufactured by these organisms are characterized so far as that is possible and their modes of action discussed. In this way precision replaces empiricism in the investigation and treatment of these diseases.

Dr. J. B. Cavanagh and Prof. R. H. S. Thompson provide much food for thought in their brief but admirable review of demyelination. They conclude that several dissimilar processes, which range from deficiency states to anti-cholinesterases, have this common feature. The results of their further study will be awaited with interest, since it is likely that here again the enzymic factors will provide the clue.

An unusual article comes from Drs. J. D. Judah and W. G. Spector, who apply modern enzymological techniques to the diseased cell. Much of this information is derived from the authors' original work on poisons such as dinitrophenol and carbon tetrachloride, and it would seem that we are on the way to resolving the problem of some cell injuries in terms of biochemical disturbance. This, too, is the main theme of Dr. H. Cullumbine's paper on war gases, some of which interfere with enzyme systems and so lead to permeability changes in the endothelium of blood vessels and upset fluid equilibrium in the body. The latter subject is well discussed by Dr. F. C. Courtice, who defines the role of altered lymph flow from damaged tissues and assesses its connexion with haemodynamics and osmotic properties of the blood. Dr. Courtice's point of view recalls the stimulating attack made about fifty years ago by the late Prof. E. H. Starling, and possesses the special merit of being based on his own superb technique for the measurement of lymph flow.

No compilation on injury can neglect the subject of 'shock', and in this symposium full justice is done to various aspects of this elusive problem. Prof. H. N. Green and Dr. H. B. Stoner describe their stimulating hypothesis, which links shock with carbohydrate metabolism; Dr. R. T. Grant summarizes his notable clinical studies made during the Second World War and Dr. J. P. Bull draws upon his wide experience in a helpful article on burns. Shock naturally raises the question of blood transfusions, and Dr. R. Bodley Scott deals with the

* *British Medical Bulletin*, 10, No. 1 (1954). Pp. 72. (Medical Dept., British Council, 65 Davies Street, London, W.1.) 15s.