well-known Paschen-Back effect, have been invaluable for theoretical discussions.

A ROYAL MEDAL TO PROFESSOR ARTHUR STANLEY EDDINGTON

Professor Eddington's contributions to knowledge within the past ten years have been mainly in connection with the internal constitution of stars and with the generalized theory of relativity. He has formulated a complete theory of the internal structure of a star, assumed to be a non-rotating whirl of atoms and electrons, with radiation gradually forcing its way to the surface; further, he pointed out that the masses of stars, which are found by observation not to vary greatly, ranged about the point where radiation pressure balances gravitation. Later, he obtained a theoretical relation between the mass and absolute luminosity of giant stars. In connection with the theory of relativity, he conducted in 1919 one of the two eclipse expeditions which verified the deflection of light rays. He also developed the theory, to a certain extent on the philosophical side, but considerably on the analytical side, especially with regard to the electromagnetic and gravitational fields.

A ROYAL MEDAL TO DR. ROBERT BROOM

During the course of thirty-three years' search in Australia and South Africa, Dr. Broom has made a very large number of important discoveries in vertebrate paleontology, embryology and morphology that shed new light upon the problems of the origin of mammals, lizards, crocodiles, and birds. His researches represent the most significant contribution made by any one investigator to the determination of the relationships of the main groups of vertebrate animals and to the definition and solution of the problems involved in the evolution of the higher groups.

THE DAVY MEDAL TO PROFESSOR FREDERICK GEORGE DONNAN

Professor Donnan is, like his master, van't Hoff, a man of ideas. Early in his scientific career he wrote on the nature of soap emulsions and on the theory of capillarity and colloidal solutions. His theory of membrane equilibrium and membrane potential is an achievement of the first rank, and has been the starting-point of numerous studies not only in the domain of pure chemistry, but more especially in biochemistry, where the conditions for displaying the phenomena he predicted are often encountered. His researches on surface tension and absorption at liquid-liquid interfaces have led to results of the greatest interest, and his verification by means of nonylic acid of the Gibbs' absorption formula is a most brilliant experimental conception.

THE DARWIN MEDAL TO DR. LEONARD COCKAYNE

A true naturalist, Dr. Cockayne has waited patiently upon facts before drawing conclusions. For more than thirty years he has made it his task to deepen and widen our knowledge of New Zealand botany in the broadest sense. He is one of the foremost living students of plant-association; the taxonomic studies rendered necessary by his ecological results have led to those remarkable discoveries of natural hybrids in New Zealand that have won for him a world-wide reputation and have made on modern thought an impression akin to that produced by the results of Darwin's studies of plants under domestication. Dr. Cockayne's researches have had, on silvicultural and agricultural procedure, a practical bearing which has been appreciated by, and has influenced the policy of, New Zealand statesmen.

THE SYLVESTER MEDAL TO PROFESSOR WILLIAM HENRY YOUNG

Dr. W. H. Young has taken a very prominent part in the development of the modern theory of functions of real variables, and in its application to the theory of Fourier's and other series. His earlier work dealt chiefly with the theory of sets of points, and contains important developments on the lines laid down by G. Cantor and Harnack. He soon proceeded to apply this theory in the integral calculus, and he obtained a general definition of the integral which is essentially equivalent to, although somewhat less simple in form, that given about the same time by H. Lebesgue, which latter has become a cornerstone of modern analysis. Much of Dr. Young's work has proved to be a starting-point for further investigations by other mathematicians. By means of his conception of restricted Fourier's series he was enabled to devise a method by which conditions of convergence, summability, etc., known to hold good for Fourier's series, could be carried over to series of Legendre's and Bessel's functions.

THE HUGHES MEDAL TO M. LE DUC DE BROGLIE

Maurice François César, Duc de Broglie, is distinguished especially for his pioneer researches on X-ray spectra and secondary β-rays. He was one of the first to obtain the complete emission spectrum of X-rays and to study X-ray absorption spectra, while his work on the magnetic spectrum of the β-rays, arising from the passage of X-rays through matter, has proved of great importance. He founded in Paris a private laboratory directed by himself, which is devoted to researches on X-rays and allied subjects.

## GRANTS IN SUPPORT OF RESEARCH ON THE EFFECTS OF RADIATIONS UPON ORGANISMS

AT the meeting of the Division of Biology and Agriculture of the National Research Council, held in April, 1928, a group of investigators[1] requested approval by this division of an attempt to obtain funds in support of studies on the "Effects of Radiations upon Organisms."

This project was endorsed by the division and a general committee and a sub-committee on solicitation

[1] These individuals were: Edgar Altenburg, H. J. Bagg, A. F. Blakeslee, W. C. Curtis, A. U. Desjardins, C. Stuart Gager, T. H. Goodspeed, Robert F. Hance, F. B. Hanson, E. E. Just, Henry Laurens, C. C. Little, J. W. Mavor, H. J. Muller, Charles Packard, W. J. Robbins, Herman Schneider, George Sperti, L. J. Stadler, Alexander Weinstein, P. H. Whiting.

of funds were immediately appointed, and, later, a sub-committee on allotment of grants.[2]

Generous response has been met in the early solicitations and the committee is able to announce that two contributions of $12,500 each have been received from the Commonwealth Fund and from the General Education Board. These contributions will be repeated annually for a period of five years, if satisfactory progress can be made in the support of these investigations. Contributions of other funds have been received from manufacturers and also of apparatus, such as X-ray and ultra-violet equipment, and of the loan of radium, totaling in value about $40,000. It is expected that additional donations will be received. These contributions from manufacturers will be listed in a later announcement by the committee.

As these funds are now available, investigators, who have worked in this field or who have peculiar qualifications for such research, are invited to present requests for support not later than March 1, 1929, for the period ending May 31, 1930. Application blanks may be obtained about February 1.

The general conditions under which grants of money or apparatus will be made were stated as follows in the proposal approved in April, 1928, by the Research Council:

I. To be eligible for consideration, an investigator must present evidence, either in the form of published papers or otherwise, that he has a problem well in hand or he must have obvious qualifications to undertake such research. He must also satisfy the committee that his institution is furnishing reasonable support and equipment for general purposes if not the special features of this work. Time available for the research will be a consideration, particularly in the case of individuals engaged in teaching.

II. The items for which a grant may be expended will include:

(a) Salaries of research assistants, technicians, clerical assistants, and others who may be employed in the prosecution of any such investigation.

(b) Purchase of materials, instruments, equipment, etc., such as might not be expected in a laboratory with good general equipment.

(c) Any other assistance, exclusive of the investigator's salary, which any project legitimately requires. Under this head a limited amount may be spent for traveling expenses by the investigator.

(d) The investigator's salary will be paid in full by his institution, which will thus contribute by the time the individual is allowed for research as well as by the general facilities of a well-equipped laboratory. In some instances, however, it may be possible to allow men on sabbatical half-pay a balance on salary account, not to exceed $2,500 for a twelve-month period.

It is therefore intended that the institution in which the investigator is working shall do its share. The committee hopes to encourage research in smaller institutions and departments, as well as to support work in the largest and best equipped universities and research institutes.

More explicit statement of policy can not be made at the present time. All communications should be addressed to the Division of Biology and Agriculture, National Research Council, B and 21 Streets, Washington, D. C.

W. C. CURTIS, *Chairman*
*General Committee on Radiation*

[2] The personnel of these committees includes: *General Committee,* W. C. Curtis (Chairman), L. L. Woodruff, and D. H. Tennent; *Sub-committee on Solicitation of Funds,* W. C. Curtis (Chairman), C. C. Little, Herman Schneider, William Crocker, and L. L. Woodruff; *Sub-committee on Allotment of Grants,* D. H. Tennent (Chairman), G. H. Parker, H. S. Jennings, C. E. Allen, W. C. Curtis.

## OFFICERS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

FULL reports of the New York meeting of the American Association and the Associated Societies will be printed in SCIENCE as soon as they can be prepared by the permanent secretary. The officers elected were as follows:

PRESIDENT

Robert A. Millikan, director of the Norman Bridge Laboratory, the California Institute of Technology.

VICE-PRESIDENTS

Section A—E. T. Bell, professor of mathematics, California Institute of Technology.

Section B—C. E. Mendenhall, professor of physics, University of Wisconsin.

Section C—S. C. Lind, director of the school of chemistry, University of Minnesota.

Section D—Harlow Shapley, professor of astronomy, Harvard University, and director of the Harvard College Observatory.

Section E—G. F. Kay, professor and head of the department of geology and dean of the college of liberal arts, University of Iowa.

Section F—C. M. Child, professor of zoology, University of Chicago.

Section G—J. Arthur Harris, head of the department of botany, University of Minnesota.

Section H—A. V. Kidder, Phillips Academy.

Section I—Madison Bentley, professor of psychology, Cornell University.

Section K—H. L. Rietz, professor of mathematics, the State University of Iowa.