interactions should satisfy unitary symmetry, implying that the various particles and resonances should appear in supermultiplets of the same spin and parity. The theory predicted an octet of spin-one mesons, which play a part in strong interactions analogous to that of the photon in electrodynamics. Such mesons have since been found.

A member of the American Physical Society and fellow of the Royal Society, Dr. Salam was honored in 1962 with the Maxwell Medal of the Institute of Physics and Physical Society.

The Royal Society awarded its Copley Medal to Sydney Chapman for his many contributions in the field of geophysics. A former head of the Special Committee for the International Geophysical Year, Dr. Chapman has also served as president of several international organizations in solar-terrestrial physics. In research, he has won recognition for his work on the kinetic theory of gases and his studies of solar and lunar geomagnetic variations and solar and lunar tides. Dr. Chapman also originated the concept of the idealized "Chapman layer" model of an ionospheric layer, and with Ferraro, developed theories of the morphology of magnetic storms under the impact of clouds of solar ions. Recently, he has advanced, with Akasofu, a new theory of the formation and changes of auroral forms.

Born in Eccles, Lancashire, England, in 1888, he was educated at the Universities of Manchester and Cambridge, and later taught at Cambridge, Manchester, Oxford, and the Imperial College of Science and Technology. Today ("in retirement"), he holds posts at the National Center for Atmospheric Research in Boulder, Colo., and the Universities of Alaska, Minnesota, and Michigan. His numerous honors include the Royal Medal of the Royal Society, the Gold Medal of the Royal Astronomical Society, and the Bowie Medal of the American Geophysical Union.

Sydney Chapman

Melvin Calvin

Melvin Calvin of the University of California received the Royal Society's Davy Medal. The award specifically cited his contributions to the study of photosynthesis, in which he used radiocarbon as a tracer to follow carbon dioxide through the series of reactions that result in the production of carbohydrates.

Born in St. Paul, Minn., Dr. Calvin received his PhD in chemistry in 1935 from the University of Minnesota and later studied with M. Polanyi at the University of Manchester. He joined the faculty of the University of California at Berkeley in 1937, and has served as director of the bioorganic chemistry group in the Radiation Laboratory since 1946, and as professor of chemistry since 1947. The recipient of numerous other awards, he won the Nobel Prize in chemistry in 1961.

Quantum Electronics Council

An intersociety Joint Council on Quantum Electronics has been established, charged with the responsibility of coordinating and organizing general meetings in the field and of representing its sponsoring organizations in international activities. Cooperating in the new organization are the American Institute of Physics, the American Physical Society, the Optical Society of America, the Institute of Electrical and Electronics Engineers, and the IEEE Groups on Electron Devices and on Microwave Theory and Techniques.

As one of its first tasks, the Council will organize the Fourth International Quantum Electronics Conference, which will be held later this year. In addition to continuing the tradition of these conferences, which were formerly sponsored by the Office of Naval Research, the JCQE intends to promote intersociety cooperation in quantum electronics and to advise sponsoring societies on specialized aspects of the field where additional technical meetings or publications are needed.

The membership of the Joint Council includes Peter Franken and C. H. Townes, representing the American Institute of Physics; James P. Gordon and Benjamin Lax, representing the American Physical Society; G. H. Dieke and Arthur Schawlow, for the Optical Society of America; Hubert Heffner and William W. Mumford, for the Institute of Electrical and Electronics Engineers; Eugene I. Gordon and Robert A. Kaplan, for the Electron Devices Group of the IEEE; and Frank R. Arams and Anthony E. Siegman, for the Microwave Theory and Techniques Group of the IEEE. Professor Heffner is chairman of the Joint Council and Dr. Arams is its secretary.

Research Corporation Award

At a dinner held in New York on January 28, William M. Fairbank, professor of physics at Stanford University, received the $10 000 Research Corporation Award for 1964. He was recognized for his contributions in low-temperature physics and especially for his discovery of flux quantization in superconductors.

In 1961, Professor Fairbank and Bascom Deaver discovered that an electric current flowing through a ring

William M. Fairbank

of superconducting metal produces a quantized magnetic flux. It was found in addition that the flux was only half of what was predicted, indicating that electrons in a superconductor's current move in pairs and in unison. The work also demonstrated that quantum effects can take place on a broad and macroscopic scale. Earlier, Dr. Fairbank and his co-workers carried out one of the first experimental investigations of second sound in superfluid helium and established the temperature dependence of the velocity of second sound. He has also received recognition for his research on the different properties of ^{3}He and ^{4}He, especially his study of the magnetic susceptibility of ^{3}He and the discovery of a phase separation in solutions of ^{3}He and ^{4}He.

Dr. Fairbank was born in Minneapolis and earned his doctorate from Yale University in 1948. Before joining the Stanford faculty as professor of physics in 1959, he taught at Duke, Amherst, and the University of Washington. A fellow of American Physical Society, he received the organization's Buckley Prize in 1963.

Instrument Society award

Warren P. Mason, head of mechanics research at Bell Telephone Laboratories, has received the 1964 Arnold O. Beckman Award of the Instrument Society of America. The award, which is given annually for work on a new principle or instrument design, specifically honored Dr. Mason's development of heavily-doped silicon semiconductor strain gages.

Through his research on stress analysis, Dr. Mason was led to apply the piezoresistance effect in silicon and germanium semiconductors to strain gages. Experiments with lightly-doped semiconductors proved to be inherently nonlinear because they were temperature dependent. However, when he increased the doping levels to the range between 5×10^{18} and 10^{20} boron atoms per cm^3, Dr. Mason found that these highly-doped samples are not only nearly temperature independent but have sensitivities two orders higher than wire strain gages. Such semiconductor gages are now widely used in the instrumentation field, for in addition to measuring very small strains, they eliminate the need for expensive amplifying equipment for moderate strains.

Born in Colorado Springs, Colorado, Dr. Mason earned his doctorate in physics at Columbia University in 1928 and has been associated with the Bell System for more than 42 years. A fellow of the American Physical Society and the Acoustical Society of America, he served as ASA president in 1955-56.

Steacie Prize

The first award of the E. W. R. Steacie Prize in the Natural Sciences has been made to Jan Van Kranendonk of the University of Toronto for his work in molecular and solid-state physics. The fund from which the award is financed was founded by friends of the late Dr. Steacie to commemorate his contributions to chemistry and his service to Canadian science as president of the National Research Council of Canada for ten years prior to his death in 1962. The Steacie Prize carries an approximate value of $1000 and is awarded from time to time for an outstanding contribution to the natural sciences in Canada by a scientist under forty years of age.

Dr. Van Kranendonk was born in Delft, Holland and received his PhD in 1952 from the University of Amsterdam. He was made a lecturer at the Institute-Lorentz of the University of Leiden in 1954, joined the staff of the University of Toronto in 1958, and has been serving as professor of physics at Toronto since 1960. His work in molecular physics includes the development of the theory of induced infrared absorption and the impact theory of Raman line broadening. In solid-state physics, he has contributed to the theory of nuclear spin-lattice relaxation and the statistical properties of spin systems, and has developed the theory of rotational and vibrational excitons and its application to the infrared and Raman spectra of solid hydrogen.

Chemistry awards

Robert S. Mulliken, codirector of the Laboratory of Molecular Structure and Spectra at the University of Chicago, has been named recipient of two separate awards in chemistry. The 1964 John Gamble Kirkwood Medal, honoring the late director of the Division of the Sciences at Yale, was presented to Dr. Mulliken in November by the Yale University Chemistry Department and the New Haven Section of the American Chemical Society. The 53rd Willard Gibbs Award is scheduled to be presented to him in May, during a dinner ceremony of the Chemical Society's Chicago Section. Both awards pay tribute to Dr. Mulliken's pioneering work in molecular chemistry.

A member of the University of Chicago faculty for more than thirty-five years, Dr. Mulliken is currently the Ernest De Witt Burton distinguished service professor emeritus in the Department of Physics and Chemistry, where he is also under a continuing appointment as distinguished service professor of physics and chemistry.

Dr. Mulliken is known for his studies of chemical bonding and molecular orbital theory as well as for his interpretation of molecular spectra and donor-acceptor complexes. A fellow of both the American Physical Society and the American Chemical Society, he has been honored by the latter organization on previous occasions with its Debye, Lewis, and Richards awards.