

AWARDS

Nobel Prizes

THE 1961 Nobel Prize in physics has been shared by Robert L. Hofstadter of Stanford University and Rudolf L. Mössbauer, who is now at the California Institute of Technology, for separate and unrelated contributions to physics.

Prof. Hofstadter was cited for studies carried out at Stanford during the past several years involving the use of high-energy electron-scattering techniques to determine the electromagnetic structure of nucleons. A series of experiments by Hofstadter and his associates provided evidence concerning the electrical-charge structures of the neutron and the proton which suggested that each consisted of a core of dense positive charge surrounded by two clouds of more diffuse charge (the so-called Yukawa, or mesonic, clouds), where the charge distribution was attributed to the circulation of mesons about the core. In the case of the neutron, the inner cloud was found to bear a negative charge, while the core and the outer cloud were positive; for the proton, the charge was found to be positive throughout.

A graduate of the City College of New York, Prof. Hofstadter took his AM and PhD degrees at Princeton University in 1938. After short periods of service as an instructor at the University of Pennsylvania and at CCNY, he spent the early part of World War II as a physicist at the National Bureau of Standards and later joined the staff of the Norden Laboratories Corporation of New York. He served as assistant professor of physics at Princeton from 1946 to 1950, when he accepted an associate professorship at Stanford University. He became a full professor in 1954.

Dr. Mössbauer, who received his PhD at the University of Munich in 1957, was cited for his discovery some five years ago of the recoilless resonance absorption of gamma rays in atomic nuclei, an effect which he first noticed in the course of an experiment he was carrying out in preparation for his doctoral dissertation. He observed that the absorption of gamma rays in a crystalline iridium sheet placed between his gamma-ray source and a detector appeared slightly higher than should have been expected. After attempting unsuccessfully to get rid of some unknown contamination assumed to be at fault, he became convinced that the anomaly was genuine. A quantum-mechanical analysis led him eventually to speculate that a certain fraction of the gamma-ray emissions from a crystalline solid give rise to no individual recoil of the emitting nuclei; instead, he concluded, the recoil momentum is received by the crystal lattice as a whole, with very little motion and a negligible Doppler effect. The resulting frequencies are so precisely defined that the shift caused by gravitational effects can be measured. Although Mössbauer published his findings in 1958, they went unnoticed for a number of months. By the end of 1959,



Robert L. Hofstadter

however, the precision in measurement made possible by Mössbauer's discovery had stimulated so much interest that meeting programs and journal pages were on the verge of being flooded with reports of new applications of the effect.

Dr. Mössbauer is now at the California Institute of Technology as a senior research fellow in physics while on leave from the Institute for Technical Physics at Munich.

Another physicist, Georg von Békésy of Harvard University, was named to receive the 1961 Nobel Prize in medicine for his studies of the human ear and the hearing process. Born in Budapest, he received his PhD in physics from the University of Budapest in 1923 and remained there as a member of the faculty until 1946. He was also associated during that period with the research laboratory of the Hungarian Telephone System, and it was there that he first became involved in studying the physics of hearing. The telephone administration wanted to improve service and at the same time avoid the high cost of an overdesigned electronic system, which led to questions concerning the nature and efficiency of the hearing process. Among Dr. Békésy's many otological discoveries, one of the most basic was his determination of the manner in which the inner ear transduces acoustical signals into nervous impulses. H. von Helmholtz had suggested that the basilar membrane in the inner ear contained fibers which were caused to vibrate by resonant frequencies of the impinging sound waves, but Dr. Békésy found that acoustical vibrations are transferred to the membrane as a whole, suggesting that the functioning of the basilar membrane is somewhat analogous to the action of a microphone diaphragm. Another of his discoveries involved the capacity of the human skin to distinguish acoustical impressions and to transmit such information to the nervous system.

Dr. Békésy has been a senior research fellow in psychophysics at the Harvard Psycho-Acoustic Laboratory since 1949. His research, which has led to many im-



Rudolf L. Mössbauer

provements in the treatment of deafness, has received frequent recognition. He holds two honorary degrees of Doctor of Medicine, and last June he was awarded the Gold Medal of the Acoustical Society of America for his investigations into the physics of the ear and its function as an instrument of hearing.

This year's Nobel Prize in chemistry has been won by Melvin Calvin, professor of chemistry at the University of California at Berkeley, for his studies of the chemical reactions occurring in photosynthesis. Prof. Calvin has worked for the past fifteen years on experiments designed to chart the sequence of compounds formed in photosynthesis by employing a technique in which known amounts of carbon-14 are included in the carbon dioxide ingested by a plant. The order in which the chemical reactions take place is determined by stopping the photosynthetic process at various times during its course and measuring the radioactivity of the products.

High-Polymer Physics Prize

THE establishment of "The American Physical Society High-Polymer Physics Prize Sponsored by the Ford Motor Company" was announced last month by the Council of the Society. The prize is to be awarded "for outstanding accomplishment and excellence of contributions in high-polymer physics" with no restrictions with respect to either the nationality of the recipient or the place where he did the work. It is also immaterial whether or not the recipient is a member of the Society.

Nominations for the prize will be made by the Executive Committee of the APS Division of High-Polymer Physics, and the eventual decision will be made by the APS Council. Members of the Physical Society are invited to propose candidates for the 1962 award; their suggestions, together with supporting statements, should be sent to Dr. Hershel Markovitz, Mellon Institute, Pittsburgh 13, Pa.

Frederic Ives Medal

ON October 19, during the Los Angeles meeting of the Optical Society of America, the Society's Frederic Ives Medal for 1961 was presented to Seibert Q. Duntley for the contributions he has made in many areas of optical research, particularly those of environmental optics and human vision.

Dr. Duntley, who has been a research physicist and director of the Visibility Laboratory of the Scripps Institution of Oceanography since 1952, is a fellow of the Optical Society and is currently serving as a director-at-large of that organization. A graduate of the Massachusetts Institute of Technology, he obtained his master's degree from the California Institute of Technology and his PhD in physics from MIT. He taught and conducted research at MIT for the next thirteen years before going to San Diego to join the staff of the Scripps Institution.

The Ives Medal was endowed in 1928 by Herbert E. Ives, a charter member of the Optical Society, in honor of his father, Frederic Ives, who was known for his pioneering work in various branches of applied optics. The award is presented annually in recognition of distinguished work in optics.



Seibert Q. Duntley

The Society also honored two other members during the OSA meeting in Los Angeles. Archie I. Mahan and L. Perry Bone of the Johns Hopkins Applied Physics Laboratory were awarded the prize for the best contributed paper of 1960. Entitled, "Far-Field Diffraction Properties of a Plane-Parallel Plate When Placed Partially in Front of a Rectangular Diffracting Aperture", the paper was presented at the OSA's 44th annual meeting (in Ottawa) and was published in the July 1960 issue of the *Journal of the Optical Society of America*. The work reported was cited as being "especially admirable in that it has taken a problem from classical optical physics and used modern mathematical tools for its solution".