# AWARDS

Sir John Cockcroft

### *Atoms for Peace Award*

SIR John Cockcroft, British physicist and Nobel laureate who is now Master of Churchill College of Cambridge University, has been chosen to receive the 1961 Atoms for Peace Award, which is symbolized by a gold medallion and includes an honorarium of $75 000. The presentation ceremony will take place on the 6th of this month at the Massachusetts Institute of Technology.

In announcing the award, James R. Killian, Jr., chairman of the Trustees of Atoms for Peace Awards, said: "Sir John's contributions to the peaceful uses of the energy within the atom range from the first demonstrations that this energy can be released by man's ingenuity and skill to the direction of the development of full-scale nuclear-powered generating stations supplying electricity to England. He has taken a leading part in the development of large-scale test reactors, in the organization and direction of one of the great research centers for the exploration of the peaceful uses of atomic energy at Harwell in England, in the distribution of radioactive isotopes for research and for medical therapy to many countries throughout the world, in the organization of a Middle Eastern Atomic Research Center in Teheran, in the organization of the Geneva Conferences on the Peaceful Uses of Atomic Energy under the sponsorship of the United Nations, in the training of scientists and engineers from many parts of the world at the school for the study of isotopes founded at Harwell, and in the discussions among scientists and diplomats about the ways in which the potential for benefiting mankind made available through atomic power can best be realized."

Sir John, a native of Yorkshire, England, studied at Manchester and Cambridge Universities. In 1930 he became a lecturer in the Cavendish Laboratory at Cambridge, where, with E. T. S. Walton, he developed the apparatus with which he and Walton, in 1932, were the first to disintegrate atomic nuclei with artificially accelerated particles in place of the radiations from naturally radioactive elements. For this work they were jointly awarded the 1951 Nobel Prize for Physics. In 1939 Sir John was appointed Jacksonian Professor of Natural Philosophy at Cambridge, a chair which he retained until the end of World War II. During the war he served first as chief superintendent of Britain's Air Defense Research and Development Establishment and later as director of the Atomic Energy Division of the National Research Council of Canada. In 1946, he returned to England as director of the British Atomic Energy Establishment at Harwell, where he remained until his appointment in 1959 as Master of Churchill College, a new foundation in Cambridge University established for study and research in science and technology.

Atoms for Peace Awards, Inc., was established in 1955 as a memorial to Henry Ford and his son Edsel Ford. Its Trustees are directed by charter "to select from among the world's scientists, engineers, and others, an individual or group of individuals, or organization who or which is determined by the Trustees each year to have made the greatest contribution to the peaceful uses of atomic energy". It also provides that the award be made without regard for nationality, politics, or any other consideration except the merit of the contribution.

### *Rumford Premium*

ON March 8, the Rumford Premium of the American Academy of Arts and Sciences was presented to Charles H. Townes, professor of physics at Columbia University, for his origination of the maser. Dr. Townes is the 52nd recipient of the award, which was established in 1796 by Benjamin Thompson, Count Rumford, and which originally consisted of "two medals struck in the same die, the one of gold, and the other of silver, and of such dimensions that both of them together may be equal in value . . . to three hundred dollars". At the present time an award of five thousand dollars accompanies the medals. Count Rumford also stipulated that the recipient should be "the author of the most important discovery or useful improvement . . . on Heat or on Light. . . ."

Dr. Townes, who is at present on leave from his post at Columbia while serving as vice president and director of research of the Institute for Defense Analyses in Washington, D. C., will become provost of the Massachusetts Institute of Technology next fall. A former member of the Bell Telephone Laboratories technical staff, he joined Columbia's faculty in 1948. Since that time he has seen service both as head of the Physics Department and as director of the University's Radiation Laboratory.

The award was presented by President Kirtley F. Mather at the 1429th Stated Meeting of the American Academy of Arts and Sciences, at the House of the Academy in Brookline, Mass. Dr. Townes was introduced by Harvey Brooks, dean of engineering and

Charles H. Townes

applied physics at Harvard University and chairman of the Rumford Committee. Townes then delivered an address on the behavior of masers and the properties and application of their radiations.

### *Research Corporation Award*

THE 1960 Research Corporation Award was presented in January to a 32-year-old physicist from West Germany, Rudolf L. Mössbauer, whose discovery of the radiation effect which bears his name has stimulated so much experimental and theoretical activity in various regions of physics during the past two years. The Award, consisting of a plaque, a citation, and $5000, was conferred at a ceremony during the annual Research Corporation Dinner which was held on January 19 at the Sheraton-East Hotel in New York City.

Dr. Mössbauer, who is on leave from the Institute for Technical Physics at Munich and is currently a postdoctoral research fellow at the California Institute of Technology, received his PhD from the University of Munich in 1957. During the period 1956–58 he worked on gamma-ray absorption and emission at the Max Planck Institute in Heidelberg, and it was there that he first became aware of the anomaly of recoilless resonance absorption in atomic nuclei—the "Mössbauer Effect". At that time he conclusively demonstrated the existence of the effect and interpreted its underlying mechanism. He published his results in 1958 in the *Zeitschrift für Physik,* but as an example of the imperfections of contemporary scientific communication processes it took about a year for the news to cross the Atlantic. Research groups at Los Alamos and the Argonne National Laboratory corroborated Mössbauer's findings in the summer of 1959, which led to such a welter of ingenious applications of the Mössbauer effect in fields ranging from relativity through nuclear and solid-state physics to ultrasonics that the editors of one major physics journal found themselves compelled in the spring of 1960 to ". . . put a damper on the influx of Letters on the Mössbauer effect, to bring them into line with policy in other fields. . . ."

In his response at the presentation ceremony, Dr. Mössbauer offered a simplified account of his experiment, in which he employed an iridium gamma-ray source, a detector, and a crystalline iridium sheet absorber placed between the two. He observed in the course of the experiment that the absorption in the iridium sheet was slightly higher than expected, but supposed at first that it might be caused by some sort of contamination effect. "At that time," he said, "I was interested in another particular peculiarity of the gamma ray involved, and for that reason I did not worry too much about this 'dirt' effect. However, having finished the experiment I intended (from which I took my thesis), I started once more to look just for curiosity into this 'dirt' effect. I performed every possible change in the experimental arrangement but I couldn't get rid of it. So I got more and more excited and spent several days just in a happy effort to kill this effect, but it was impossible. . . . I first tried some practical explanations, but all of them failed. Then I started to do some quantum-mechanical treatment. I had some analogy from neutron physics, and from x-ray physics. They led me to the assumption that it might be possible that an emission of gamma radiation happened without giving any recoil to the emitting nuclei."

He finally came to the conclusion, which turned out to be correct, that a certain fraction of the gamma rays emitted by nuclei in a solid are emitted without individual nuclear recoil and that instead the recoil momentum is delivered to the crystal lattice as a whole, resulting in negligible Doppler shift. In subsequent experiments he showed that the effect made it possible to make direct measurements of the widths of extremely narrow transition lines and to observe precisely energy shifts many orders of magnitude smaller than could be measured before.

Research Corporation, a private foundation established nearly fifty years ago to provide means for the advancement of scientific investigation by contributing to educational and scientific institutions, created the Research Corporation Award in 1925 to honor scientists who have made outstanding contributions to human knowledge. The Award was given irregularly until 1935, and since that time has been presented on an annual basis, contingent upon the availability of a suitable candidate.

Plaque symbolizing Research Corporation Award is presented to Rudolf L. Mössbauer (right) by J. William Hinkley, president of the foundation.