Edward U. Condon, President-Elect of the AAAS

AT THE LAST MEETING of the American Association for the Advancement of Science, Edward U. Condon was chosen president-elect of the Association. The choice promises to be a happy and interesting one: the AAAS embraces all the sciences, discerning the linkages among them and the intellectual and social threads common to them all. Somewhat analogous qualities are characteristic of Condon: a breadth of scientific interests, appreciation of the essential unity of the sciences, and a sensitivity to the many problems confronting men of good will. And these qualities rest on the firm foundation of a genuinely creative intellect, revealed in his distinguished original research in theoretical physics, fully tempered in a variety of scientific and administrative positions—academic, industrial, and governmental.

Dr. Condon's birthplace was Alamogordo, New Mexico, which became famous when the first atomic bomb was exploded in the desert near by. He was born on March 2, 1902, and entered the University of California at Berkeley 18 years later. He received the B.A. degree with highest honors in 1924 and the Ph.D. in 1926. Awarded an International Education Board Fellowship, he studied in Göttingen and Munich in 1926–27.

The next ten years were devoted to teaching and research. On his return from Europe in 1927, he lectured in physics at Columbia University; he was appointed assistant professor of physics at Princeton the following year. In 1929 he accepted a professorship, at the age of 27, at the University of Minnesota, but returned to Princeton in 1930, teaching undergraduate and graduate physics and applying, in his own research, the new methods of quantum mechanics to problems of atomic and molecular structure and the interpretation of radioactivity.

In 1937 he was appointed associate director of research of the Westinghouse Electric Corporation. His assignment there was to improve and strengthen the program in fundamental physics, and he established the Westinghouse postdoctoral research fellowship plan. As part of this program, he directed a group of young physicists in the construction and research application of a large, high-voltage electrostatic generator, and research was carried on several years before the discovery of fission and general recognition of the importance of applied nuclear physics. During this period Condon also served as advisory professor to the University of Pittsburgh and was particularly active on the committee that stimulated the raising of funds for the construction of a cyclotron by the university's medical school prior to the war.

Condon launched into war work at Westinghouse in the fall of 1940, soon after the establishment of the National Defense Research Committee. He was one of the original founding group of the Radiation Laboratory at MIT, where he organized the theoretical group and started the work on theory of directional antennas and of the microwave magnetron and reflex klystron. He was appointed chairman of the Microwave Committee of Westinghouse, organized to manage and develop research and production programs in this field at the company's Pittsburgh, Baltimore, and Bloomfield establishments.

In 1941 he became a member of the NDRC Rocket Committee and of Sub-Committee S-1. The latter had responsibility for the establishment of the government's uranium project and made the decisions leading to the creation of the Manhattan District. In the spring of 1943 Condon undertook to assist Robert Oppenheimer in the organization of the Los Alamos Laboratory. In the fall, at the urgent request of E. O. Lawrence, he undertook theoretical work on the electromagnetic isotope separation project at the University of California. He returned to Westinghouse in Pittsburgh in February 1945, resigning in October to accept appointment as director of the National Bureau of Standards.

In addition to the directorship of the bureau, Dr. Condon was appointed a member of the National Advisory Committee for Aeronautics, chairman of the Federal Specifications Board, member of the Interdepartmental Committee on Scientific Research and Development, chairman of the Senate Advisory Committee on Color Television, and scientific advisor to the Senate Special Committee on Atomic Energy. His activities at the bureau were concerned with both scientific and administrative problems. During his tenure the bureau increased considerably its research programs for defense, developed new fields (applied mathematics and electronic computers, for example), and acquired important new facilities at Corona, California, and Boulder, Colorado. Dr. Condon resigned on September 30, 1951, to assume his present position as director of research and development for the Corning Glass Works.

Throughout these years, he maintained an active interest in the various scientific societies and groups. He was president, American Physical Society (1946); member, Governing Board, American Institute of Physics (1945–48); member of the National Research Council; chairman, Committee on Chemical Constants and Committee on Fundamental Physical Constants (NRC); member, Visiting Committee of Department of Physics of the Board of Overseers, Harvard University; member, Advisory Council of the Department of Electrical Engineering, Princeton University; member, Board of Visitors to the Physics Department, Union College. He was elected a member of the National Academy of Sciences in 1944, the American Academy of Arts and Sciences in 1947, the American Philosophical Society (Philadelphia) in 1949, and

served as president of the Philosophical Society of Washington during 1951. In 1950 both the University of Delhi, India, and the New Mexico School of Mines awarded him the honorary D.Sc. In 1951 he was elected an honorary member of the Société Française de Physique—an honor previously accorded to only nine other scientists. He was also elected a fellow of the Royal Society of Arts (1949) and a member of the Royal Swedish Academy of Engineering Sciences (1950).

This list of biographical facts is incomplete, and it does not indicate the scope of his own research contributions to science. A few examples may suggest the scope of the latter. In the fall of 1928 he developed, with R. W. Gurney, the quantum mechanical theory of α-particle radioactivity, which is one of the important basic principles of all modern theories of nuclear structure. In this same period occurred that application of quantum mechanics to principles governing nuclear transitions in band spectra, which has come to be known as the Franck-Condon principle. While at Princeton, he published a number of special research papers on atomic and molecular structure. Two may be mentioned as of some interest a little outside the field: a review of previous theories of optical rotatory power of materials like sugar containing an asymmetrically bound carbon atom and, second, the development of a new form of quantum mechanical theory of this property. During the Minnesota period, he applied the Franck-Condon principle to predictions concerning processes by which molecules dissociate under electron impact in such a way that fragments acquire large amounts of kinetic energy. In 1928–29 he wrote, jointly with P. M. Morse, the first American book on *Quantum Mechanics*. Between 1932 and 1935 he wrote *The Theory of Atomic Spectra*, with G. H. Shortley as joint author, the first complete treatment of the subject in terms of modern quantum mechanics.

To these sober achievements, one should add the many lighter ones. The "Nimatron" is as good an example as any. The game of Nim was frequently played by Westinghouse scientists at lunch. Condon one day made an idle remark to the effect that he could design a machine that would play the game—and win. Westinghouse took him up on this, deciding that the device would be an attraction at its exhibit in the New York World's Fair. Condon thereupon created, in effect, the first electronic digital computer. It worked only too well: players at the Fair were exasperated by the diabolical rapidity and sureness of the machine, and noisy delays were added to the monster so that human players—still usually defeated—could have the satisfaction of making the Nimatron grunt and heave appropriately.

The light touch is shown best, as many know, in Condon's conversation and addresses, the grace and humor of which are relevant attributes of his mind. The following paragraph from his paper on "Foundations of Nuclear Physics" is a minor example of this quality:

Whenever one writes an outline of the history of atomic physics, he must start with an appropriate allusion to Lucretius, the Latin poet in whose *De Rerum Natura* we find the idea poetically stated about two thousand years ago that all matter is made of atoms. This does not so much prove that the writer has read Lucretius as that he has read other historical articles on atomic theory.

No matter how complete the list of titles, positions, and accomplishments, there is still the interesting question of the essential nature of the man. Perhaps the single word that best describes Condon is humanness, a quality that in him is neither acquired nor calculated but is innate. The obvious manifestations of his humanness are his integrity, candor, warmth, humility, and humor, combined with a great love of life and incessant curiosity about its diverse aspects. These qualities account in some measure for his productivity in various areas of the sciences, for his interest in such subjects as religion, philosophy, and the social sciences, and, perhaps, for a flair for conversation and wit and a facility in writing that are unusual.

These qualities also account in some measure for his devotion of much time, energy, and genuine interest to others. At Princeton he devoted considerable attention over a period of five years to the development of a special honors course for freshmen in general physics, which carried the students much farther than is usually done in freshman courses. He has helped to develop many young physicists—for example, in the Westinghouse Research Fellowship program, which he directed. In the first group of appointees were J. A. Hipple, now in charge of mass spectrograph developments at the National Bureau of Standards; W. E. Shoupp, now in charge of the Westinghouse atomic energy program; W. E. Stephens, professor of physics at the University of Pennsylvania; Signey Siegel, now assistant technical director of the atomic energy program of North American Aviation; and R. O. Haxby, professor of physics at Purdue University. At Princeton he supervised the work of Edwin McMillan, Frederick Seitz, and G. H. Shortley—each of whom today holds a high place in American physics.

The selection of Dr. Condon as president-elect is, of course, an honor: his career, sketched here hurriedly and incompletely, would suggest that the honor is an appropriate one. The selection is also, however, appropriate in another sense. The AAAS stands as the major integrating organization of science in America, and science today is confronted with many new problems and many new permutations of old ones. Some of these problems have been quite evident in the years since the war; many of them have developed from the growing interrelationships of science in the university, in industry, and in government. For reasons like these, Condon's selection is perhaps especially appropriate at this time, for he brings to the Association considerable experience in all these arenas, firmly based on personal scientific achievement and on proved ability to lead and direct, fortified by those spiritual qualities without which knowledge and talent alone are often of little avail in human affairs.