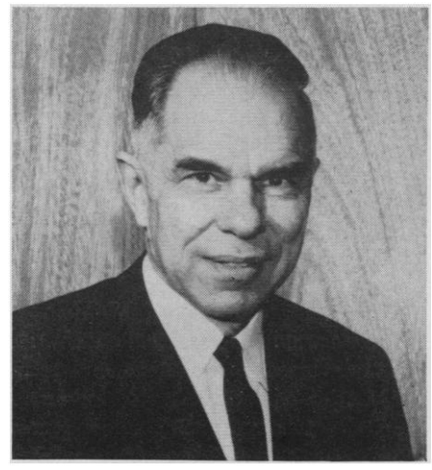
Glenn T. Seaborg, President-Elect 1971

Glenn T. Seaborg, the president-e'ect, has served science and has encouraged the utilization of science in the service of mankind for more than 30 years. His contributions have ranged from those of an outstanding laboratory research scientist, with accomplishments worthy of the Nobel prize, to those of the government public servant, who encouraged the use of science and technology for improvement of the health and economic welfare of peoples both at home and abroad. His vision has guided his own personal activities and the activities of others beyond today's problems; it has provided significant and imaginative goals; it has stimulated youth to become better informed and to understand the role of science and technology in the future development of our society. Glenn Seaborg brings to the office a wisdom derived from a variety of firsthand experiences— as a research scientist, as a team leader and director of research, as an educator, as chancellor of an eminent university, as a government adviser, as a high-level government official, and as a proponent of international understanding and security.

Although his career has been linked to science and especially to nuclear science, he has been prominent in other endeavors. His many writings and speeches, especially in the past 15 years, have reflected the importance of the humanities. His personal interest in sports is well known to his associates. His concern for peace in the world through communication, understanding, and friendship is shared equally with his concern for national economic and military security.

Glenn Seaborg is recognized as a world authority on the transuranium elements. During the last half of the 1930's at Berkeley, he completed his graduate work with a thesis on the inelastic scattering of fast neutrons, served as personal research assistant to G. N. Lewis, became one of the now famous disciples in E. O. Lawrence's cyclotron laboratory creating and identifying many new radioisotopes, and, after the discovery of fission by Hahn, Meitner, and Strassmann in 1939, moved vigorously into the investigation of the transuranium elements. Starting with element 94 (plutonium) in 1940, he was codiscoverer during the next 18 years of nine transuranium elements. In 1941 Seaborg and his associates—including graduate students—identified plutonium-239 and uranium-233, the nuclear energy isotopes so important to future energy production utilizing breeder reactor technology with uranium and thorium as the respective natural resources.

In April 1942, Seaborg took leave from the University of California to head the plutonium work of the Manhattan Project at the University of Chicago Metallurgical Laboratory. He directed the development of the chemical process for separating plutonium from fuel elements irradiated in the Hanford production reactors; in the course of that work, he and his associates discovered element 95 (americium) and element 96 (curium). In May 1946, he returned to Berkeley as full professor and also became responsible for the direction of the nuclear chemical research at the Lawrence Radiation Laboratory.



Glenn T. Seaborg

In addition to work on transuranium elements, Seaborg and his colleagues were responsible for the identification of more than 100 isotopes of the elements. Working with physicists in Lawrence's laboratory, Seaborg brought to the research endeavor a chemical finesse most important at that stage of exploration to the separation and identification of a large number of isotopic activities. Particularly significant, especially for applications in research and in medicine, are iodine-131, iron-55, iron-59, cobalt-60, manganese-54, and antimony-124.

Seaborg has emphasized the ordering of information as a forerunner to the development of theory and the subsequent prediction of new physical effects and phenomena. He was author of the actinide concept of the heavy element electronic structure, which demonstrates that the heavy elements form a "transition" series of actinide elements in a manner analogous to the lanthanide series of rare earths. This then permitted the prediction of hafnium-like properties for element 104 and the postulation of the chemical properties of elements of even higher atomic number. The information assembled in Seaborg's laboratory and by associates who have followed him has made it possible to predict the characteristics of many elements still unfound. Whole new systems of methodology and instrumentation have been developed under his leadership.

Seaborg was born of Swedish parents in Ishpeming, an iron-mining town in Michigan's upper peninsula. The family moved to California, principally to extend the children's horizons, when Glenn was 10 years old. Although several generations of Seaborg men were machinists and his mother preferred a commercial course for him, young Seaborg, upon entering high school in the Watts District of Los Angeles, chose a college preparatory curriculum. Having the good fortune to have an outstanding and inspiring teacher for high school chemistry and physics, Seaborg chose science as his future course of interest. Attendance at a university was possible only because of California's low cost higher education opportunities and a variety of summer jobs, odd jobs, and university assistantships that provided Seaborg with the wherewithal to continue his education. His years at UCLA further confirmed his interest in science. Although at the time he preferred phys-

ics, he believed that a chemist had a wider range of job opportunities. He chose the University of California at Berkeley for graduate work; the chemistry staff at Berkeley was legendary and the attractions of Lewis and Lawrence were overpowering. His association with Berkeley has been long and continuous, interrupted only by leaves of absence, first for wartime work in the Manhattan District and second as chairman of the Atomic Energy Commission.

While devoted to science, Seaborg early showed other interests. At the University of California in Berkeley he served as faculty athletic representative to their intercollegiate athletic conference. His interest in athletics and his support of the University of California's athletic teams led him to undertake this added assignment. In the summer of 1958, Clark Kerr became president of the university, and Seaborg was summoned to fill the vacated position of chancellor of the Berkeley campus. His acceptance required him to reduce the amount of time previously devoted to his foremost interests of research and teaching. However, he continued as an associate director of the Radiation Laboratory and continued to direct the research of graduate students. This was the beginning of a long period of administrative responsibilities, and yet Seaborg was able personally to maintain his leadership in his chosen field of science, to stimulate his associates and others to new research endeavors, and generally to provide a guiding hand.

Seaborg served as chancellor of the Berkeley campus for 2½ years. This period during the late 1950's saw important academic developments and a tremendous expansion of the physical plant of the university. His concern over the need to strengthen the humanities, to provide some balance with the sciences, contributed to the creation of the Institute for the Humanities. Interested in teaching and its need to be significantly strengthened, Seaborg became chairman of the Chemical Education Material Study (CHEM Study), a program that has revolutionized the high school curriculum in chemistry throughout the nation. He proposed the Lawrence Hall of Science, a facility in which research in science teaching and the dissemination of knowledge to the public could be carried out.

In January 1961 President Kennedy asked Seaborg to serve as chairman of the Atomic Energy Commission, a position which he has continuously held, serving under Presidents Kennedy, Johnson, and Nixon. The appointment of a scientist as chairman of the AEC emphasizes the role of science and technology in such an agency and the importance, which President Kennedy foresaw, for science in the government in general. This was not Seaborg's first role in the federal government, although it was his first as a full-time employee with operational responsibility for one of its major agencies. He had been appointed by President Truman in 1947 to the first General Advisory Committee for the Atomic Energy Commission, a position he held until 1950, and by President Eisenhower to the President's Science Advisory Committee (PSAC) in 1959 and to the National Science Board in 1960, positions from which he resigned in 1961 when he joined the AEC. During his PSAC service he was chairman of the panel that prepared the report "Scientific Progress, The Universities and The Federal Government." In this document, which has become known as "the Seaborg report," the federal policy in support of basic research is spelled out, as well as the integral relation between research and graduate teaching and the need for strengthening university advanced teaching programs. He was a member of the Commission on the Humanities, an activity which in 1965 led to the creation of the National Foundation on the Arts and Humanities.

Seaborg has written many books and articles throughout his career, even in those periods when he has held demanding administrative responsibilities. Of the books that reflect his field of scientific knowledge, the latest is a two-volume work with Hyde and Perlman, *The Nuclear Properties of the Heavy Elements*. More recently he has treated a wide variety of subjects by hundreds of speeches to public forums, national and international conferences, academic assemblies, youth forums including symposia for high school students, and as president of Science Service, the International Science Fair, and the Science Talent Search.

Seaborg has served the Atomic Energy Commission well, and his position as chairman has permitted him to contribute personally to the strengthening of programs in science, education, national welfare, and international security. He has delineated the role of basic research and the need for extensive research efforts in universities, national laboratories, and industry to provide for the continuing understanding of nature, the impact of the utilization of technology, and the economic development of the individual nations of the world. He has stressed the role that energy will play in our lives and emphasized the development of adequate energy resources to satisfy the world's needs. He holds a lifelong view that science in our time is not an ivory tower and that scientists should bring their experience and special knowledge into the general matrix of knowledge from which decisions are made in a democracy that increasingly depends on science and technology. In many respects Seaborg has built a second career fashioned around the public aspects of science, one which closely parallels in time his service with the federal government and which is no less impressive than his research career.

Seaborg's activities derive not only from a motivation to be a participant in human affairs but also from his understanding of the impact of the scientific revolution on social institutions. For over a quarter of a century he has advocated the peaceful aspects of the scientific revolution, acting to expand and to strengthen science and technology not only for the achievement of ancient human aspirations for better material life but also as instruments for cultural and esthetic enrichment.

Seaborg's interests are reflected in the atomic energy program with its diversity of fundamental research and applications to national defense, to space, to human health, and to national welfare, especially in the production of energy. He has expounded the benefits and the risks, communicating with the citizen and with public officials on the national and international scene.

A determined and tireless campaigner for improved international relations through the flow of information, including visits by and exchanges of scientists, Seaborg has visited over 60 countries, touching every continent, during his AEC chairmanship. These visits have included talks with heads of states and other government officials, visits to laboratories, schools and universities, and speeches on specific scientific subjects. His recent most extended trip, a 1970 visit to Africa, opened new channels of cooperation between U.S. scientists and African scientists. His success in these endeavors is widely recognized. Many of his visits permitted constructive discus-

sions with his counterparts of the Non-Proliferation Treaty, which he strongly supported. He has headed the U.S. delegation to the International Atomic Energy Agency General Conference annually since 1961, was a member of Secretary Rusk's delegation to Moscow for the signing of the Limited Test Ban Treaty in 1963, and was chairman of the U.S. delegation to the Third Geneva Conference on Peaceful Uses of Atomic Energy in 1964.

Seaborg's honors have been extensive and are far too numerous to list. Best known are the major awards for scientific achievement; the Nobel prize (with E. M. McMillan) for work in the chemistry of the transuranium elements in 1951, and the Atomic Energy Commission's Fermi award for work in nuclear chemistry and his leadership in scientific and educational affairs in 1959. The Arches of Science Award was presented in 1968 by the Pacific Science Center for contributions to the public understanding of science in a complex and changing society. He has been recognized nationally and internationally by honorary degrees and memberships in various academies and professional societies. An early indication of these honors to come was his selection by the U.S. Junior Chamber of Commerce as one of America's ten outstanding young men of 1947, a recognition of early clear-cut achievements in a specific field coupled with the promise of broader contributions to come.

The president-elect comes to the AAAS as a highly qualified proponent of science; an able practitioner of communication and understanding in the arts, humanities, and sciences; a firm believer in youth and the future of the world; and a gentleman sensitive to the views of others. His vigor and ability to fit everything into the 168-hour week will still permit time with his wife, the former Helen Griggs, and their six children; occasional attendance at a sports event; and a myriad of public service activities—in addition to his continuing obligations to the government in particular and to science and education in general.

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AAAS Council Meeting, 1970

William Bevan

The AAAS Council met in Chicago on 30 December 1970 in the Grand Ballroom of the Conrad Hilton Hotel. President Athelstan Spilhaus presided. Two hundred and thirty Council members attended. The meeting was called to order at 9:00 a.m. and was adjourned at 12:35 p.m. (The recent procedural changes of holding elections by mail ballot and of circulating written reports of the chairman of the Board and the chairmen of committees to Council prior to the meeting represent genuine economies of time.)

Executive Officer's Report

The Council began its business by formally accepting the report of the chairman of the Board of Directors. The presiding officer then called on the new executive officer to present the 1971 operating budget approved by the Board at their meeting of 12–13 December 1970. In doing so, Dr. Bevan took occasion to review the growth and development of the Association during the term of his able predecessor, Dr. Dael Wolfle. During the past 15 years, the Association's membership has grown from 52,000 to 133,000; its annual general income budget from less than $750,000 to more than $5 million. While *Science* and the Annual Meeting have continued to be the most publicly visible of the Association's programs, the most dramatic development in recent years has been the emergence of action programs directed toward the science-in-society theme first enunciated at the Arden House Conference. During the past year, special attention has been given to the role of youth in the Association's programs.

The 1971 Budget

In his presentation of the budget (see Table 1), the executive officer reported that, for the second time in 30 years, the Association had operated at a deficit during 1970. This was estimated to be of the order of $150,000. The deficit was attributed to four factors: (i) an unanticipated drop in advertising revenues, presumed to result from the general decline in business activity and from recent federal policies on the funding of research; (ii) increased costs of the Annual Meeting; (iii) increased activity of commissions and committees; and (iv) recent inflationary trends. The last mentioned represents, perhaps, the most serious long-term problem for organizations like AAAS. The dues dollar last approved by Council is now worth only 84 cents, and operating costs have suffered marked increases. For example, manufacturing costs of *Science* have gone up 15 percent; postage, 20 percent; utilities in the Washington area, about 11 percent; airline fares, 25 percent; and office personnel costs in the Washington area, 34 percent.

The 1971 general revenue budget is approximately at the same level as that approved for 1970 ($5,141,200); for 1971, revenue projections total $5,048,-200. On the expense side, the loss in advertising revenue will be compensated for in part by increasing the subscription rate for *Science* to nonmembers to $20, by passing on delivery costs of foreign subscriptions, by eliminating the 1 January issue, and by other similar measures. The remaining costs can be met only by a drastic cutback in program or by seeking an increase in dues. Accordingly, the executive officer indicated that, in the very near future, Council would be asked to approve an increase in dues from $12 to $16, effective 1 May 1971.