Kenneth E. Boulding, President-Elect of the AAAS

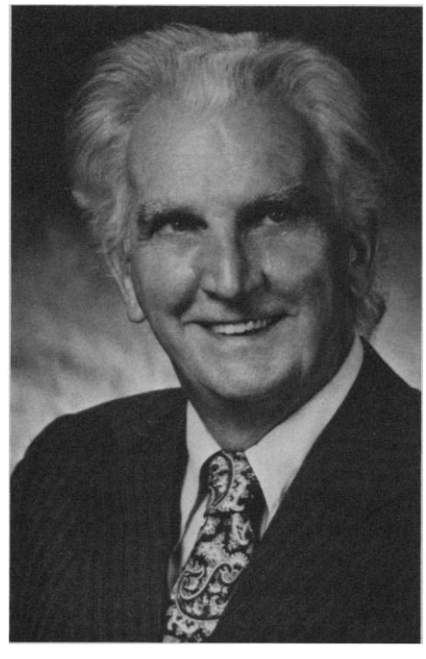
Larry D. Singell

The election of Kenneth Boulding as president-elect of the AAAS continues the tradition of selecting an individual who is not only distinguished because of significant and fundamental contributions to a particluar field of science but who also has the knowledge and vision to look at science as a whole and accordingly to represent the entire scientific community.

Boulding was born in Liverpool, England, in 1910, the only child of deeply religious Methodists. His father was a plumber, and the family lived, for most of Boulding's youth, in the heart of a city he would later describe as dirty and noisy.

In 1928, at the age of 18, he left Liverpool to attend Oxford University on a scholarship in chemistry. After a short time he switched to the Honor School of Philosophy, Politics and Economics, specializing in economics. While still a student at Oxford he produced a brief but brilliant paper that John Maynard Keynes accepted for publication in the *Economic Journal*. A few years later, as a graduate student at the University of Chicago, he worked mainly in capital theory, in which he published some articles that led Frank Knight, a leading economist, to write a paper entitled, "Mr. Boulding and the Austrians." It was this exchange in the economics literature which not only illustrated the lucidity and freshness of Boulding's mind but established him at the age of 24 as an important intellect in social science.

As in the case of major economists for the past 300 years, Boulding's first major work was a book that systematically developed the principles of economics. The first edition of this book, entitled *Economic Analysis*, was written while he was an instructor at Colgate University in the late 1930's and was published in 1941. It went through four editions in about 30 years and was the standard textbook in intermediate economic theory. Since then, Boulding has written some 25 major books and approximately 500 articles and monographs. Perhaps the most impressive thing about Boulding's work as a scholar is that his interests have ranged from the trivial to the cosmic, and he has made important intellectual contributions in a number of different areas. His work is united by a broad interest in general systems theory. Although this interest may be evident even in Boulding's earliest works, it became a major pursuit when, in 1949 as Professor of Economics at the University of Michigan, he conducted a seminar in the integration of the social sciences. This course attracted more biologists, physicists, and engineers than it did social scientists, and thus led him into the development of general systems.



Kenneth E. Boulding

Boulding was one of the founding fathers and the first president of what was later called the Society for General Systems Research. In this field he wrote an article that has been widely reprinted, "General systems theory—the skeleton of science" (1956). In these early years at Michigan, along with a year at the Center for Advanced Study in Behavioral Science at Stanford (1954–55), he became acquainted with biologists and biological thought. His wide reading at this time in theoretical biology was linked to his earlier work on ecology and pointed toward his later work on evolutionary theory.

This theoretical structure formed the foundation for a number of Boulding's later works. For example, in *Conflict and Defense* (1962) Boulding utilizes this structure and draws on a number of disciplines to develop a general theory of conflict and international systems. In *The Primer on Social Dynamics* (1970), ecological and evolutionary models of the social systems are utilized to construct a critique on the Marxist and other dialectical interpretations of history. Perhaps one of the best illustrations of the insights which may be gained from the application of general systems theory to science and society may be found in Boulding's 1964 book, *The Meaning of the Twentieth Century*.

In a paper entitled "The universe as a general system," delivered at the 1977 AAAS meetings, Boulding extended the frontiers in general systems theory once again by developing what he now calls "ecodynamics" which, he suggests, is perhaps the most general system of the universe and is a pattern of relationships in which all the sciences, even the physical sciences, share, although of course each in a different degree. The mechanical equilibrium models, like celestial mechanics, he suggests may be only a very small and temporary part of the structure of the universe. Celestial mechanics, for instance, is successful only because the evolution of the solar system at present throws very little light on the larger problems of evolutionary systems. He speculates that even the elementary particles of physics may really be an ecosystem and that ecodynamics may also turn out to be a key to those learning processes which are the genetic base of societal evolution. In his view, the greatest task of the scientific community now is to transcend the mechanical and materialist, which dominated its early history.

Boulding is currently Distinguished University Professor of Economics and Program Director of the Program of Re-

Dr. Singell is professor and chairperson of the department of economics, University of Colorado, Boulder 80309. He is the editor of three volumes of Kenneth Boulding's *Collected Papers* (Colorado Associated University Press, Boulder; vol. 3, 1973; vol. 4, 1974; vol. 5, 1975).

search on General Social and Economic Dynamics at the Institute of Behavioral Science at the University of Colorado. His *Collected Papers*, published by the Colorado Associated University Press in five volumes, reflect and summarize his interests and life work. There are two volumes of moderately technical economics, one volume of economic policy, one volume of general systems, and one volume of peace and conflict studies. There seems to be no sign of a slowdown in Boulding's production. Since the publication of the *Collected Papers*, enough papers to fill at least another volume have either appeared in print or await publication. These reflect most of the old interests and also one or two relatively new ones, such as energy and exhaustible resources, stimulated in part by his membership on the Committee on Nuclear and Alternative Energy Systems of the National Academy of Sciences. There are papers also on problems of equality, equity, and justice and on the economics of the household, and aspects of the future. One of Boulding's current interests is what he calls "epistemological statistics" (that is, what do you know when you know a number?) and a book on this subject is in the making. Two books to be published in the spring of 1978 continue major interests. One is *Stable Peace*, to be published by the University of Texas Press, which developed out of lectures given at the University of Texas, Austin, in the spring of 1977 in his capacity as the Tom Slick Distinguished Visiting Professor of World Peace in the Lyndon B. Johnson School of Public Affairs. The second is *Ecodynamics*, to be published by Sage Publications, which expands the argument of *The Primer on Social Dynamics* (1970) into a general evolutionary theory, going back even into the prebiological evolution of energy and matter, then through biological evolution into societal evolution. Here again, this is a work essentially in one of the general systems of the universe, with particular emphasis on the impact of evolutionary models on the interpretation of human history.

He has been active in the life of the scientific community, having been president of the American Economic Association in 1968, of the International Studies Association in 1974, as well as president of a number of smaller societies. He has been elected to all the major honor societies of the scientific community: the American Philosophical Society, the American Academy of Arts and Sciences, and, in 1975, the National Academy of Sciences. He has received a large number of honorary degrees and many prizes and awards.

Beyond the scientific community he has published two volumes of verse; he is an amateur painter and composer; he is married to a very distinguished sociologist, Elise Boulding, who also is a professor at the University of Colorado; they have five children whom they have reared to share their own deep-seated commitment to act for the common good.

As a social scientist and economist, Boulding may bring a somewhat different perspective to the AAAS when compared with previous presidents from the physical sciences. A good part of Boulding's work in general systems has been aimed at demonstrating that the scientific community at large must take the social sciences seriously. Thus he has argued that the assumption that the physical sciences are "hard" and secure while the social sciences are "soft" and insecure is absurd and cannot be justified. Economics is almost as secure a science as chemistry; psychology is as insecure as astrophysics. He maintains that neither economics nor chemistry is likely to suffer drastic changes; psychology and astrophysics may well go through a series of scientific revolutions simply because they sample such a small proportion of their total universe of interest. More importantly, it is only through our understanding of the general system which integrates the physical and social sciences that we finally understand the nature of human betterment.

Finally, it must be said that Boulding has always expressed and demonstrated a concern about the politicizing of professional associations even in what is widely agreed to be a good cause. In his view, the function of science is to point to our ignorance rather than to our knowledge. This is particularly true in regard to political issues, where the uncertainty about the consequences, even of policies that rightly attract great moral commitment, means that the scientific identity demands modesty in assertion and a commitment to the testing of error rather than to any specific formulation of truth. On these grounds, he asserts that political activity, desirable and necessary as it is, should be channeled through political organizations and that professional and scientific associations should be mobilized for these purposes only in the very last resort. A too easy politicizing of them, indeed, will destroy their very function as a resource for extreme cases.

Albert Einstein once observed that, whenever a scientist makes fundamental contributions on the frontiers of knowledge, it is difficult for his contemporaries to judge whether they are those of a genius or a crank. While all the evidence is not in, Boulding seems to be a rare genius who has not only the skills of a highly competent scientist but a vision regarding the contribution that science can make to human betterment. In the final analysis the importance, excitement, and potential of this vision may be the most important contribution that Boulding may make as president of the AAAS.