Elvin Charles Stakman: President of AAAS, 1949

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TO PLACE A SCIENTIST in an applied field of biology at the helm of the AAAS might have been considered utter heresy not so many years ago. Times change, however, and today both the academic and applied fields of all the sciences are filled with broad-visioned men dealing with theories, principles, applications, and the whole gamut of scientific experiences in relation to human progress. The Ivory Tower is obsolete largely because of the beliefs and activities of such men as E. C. Stakman, who is chief of the University of Minnesota's Division of Plant Pathology and Agricultural Botany and agent in the U. S. Department of Agriculture.

The new president of the AAAS, born May 17, 1885, in Algoma, Wisconsin, and educated in Minnesota, has the adventurous spirit of the Midwest. Life was never a bowl of roses to be admired and enjoyed for mere beauty. An education involved struggle, rigorous discipline, and sacrifice. Keenness of observation was to be sharpened by constant practice and intense interest in ordinary and extraordinary phenomena of everyday living. New ideas were to be entertained and carefully investigated. Intellectual integration of known facts and the ability to think clearly were worth many long hours of discussion and argument. The result is a vital, dynamic, stimulating personality eager for participation in numerous intellectual pursuits and tireless in efforts to enable other students the world over to contribute to human knowledge.

Stakman was graduated from the University of Minnesota in 1906 and was honored by election to Phi Beta Kappa. The M.A. degree was conferred upon him in 1910, and the Ph.D. in 1913. The honorary Doctor of Natural Sciences was awarded by the University of Halle-Wittenberg in 1938. He is a member of Sigma Xi, the National Academy of Sciences, the American Philosophical Society, the American Academy of Arts and Sciences, the Washington Academy of Arts and Sciences, and L'Académie Royale d'Agriculture de Suède. He holds honorary membership in the Sydney University Agricultural Society and the Canadian Phytopathological Society, and was instrumental in organizing the Mexican Phytopathological Society. He has served as president of The American Phytopathological Society, as chairman of numerous committees of that society, and as editor-in-chief of its journal, *Phytopathology*. He also has been American editor of *Phytopathologische Zeitschrift* and a member of the editorial committee of *Annual Review of Microbiology*. He is an active and forceful member of the Executive Committee of the National Research Council and the Advisory Committee on Biology and Medicine of the U. S. Atomic Energy Commission. He represents the AAAS on the Cooperative Committee on Science Teaching. Throughout his scientific life Stakman has been associated with the University of Minnesota and the U. S. Department of Agriculture. In 1930, however, he was visiting professor at the University of Halle-Wittenberg, and on numerous occasions he has undertaken special scientific or educational missions while on leave from the University.

The researches of Prof. Stakman and his colleagues have helped to lay foundations for many cooperative enterprises of plant scientists and agriculturalists. He has succeeded in coordinating controlled and precise experimental work in the biological laboratory with extensive and careful observations in Nature's laboratory. His researches on physiologic specialization within species of the rust fungi and on epidemiology of the cereal rust diseases elucidated the pathological principles basic to the synthesis of disease-resistant varieties of cereal crops for the vast grain-growing areas of the Mississippi Valley. His painstaking work on physiologic specialization of numerous fungi has influenced the biologist's concept of a species and has provided a better understanding of the biotypes and racial entities that make up a taxonomic species. Studies on barberries have emphasized the importance of the stem rust's alternate host as a source of inoculum for cereal hosts and as a breeding place for the fungus where new strains may arise, some of which may be far more dangerous than their progenitors. Stakman's researches on the smut fungi have opened the way for careful investigations concerning genetics of microorganisms, for the smut haplonts (1n) are easily cultured on artificial media for physiologic study and readily cross in the host plant to provide material for a study of the inheritance of various characters. His investigations in aerobiology were pioneer work—probably the first work in which airplanes were used to trap spores of microorganisms in the air. From that work have come numerous studies on the distribution of allergenic microorganisms, on the dissemination of plant pathogens over continental areas, and on protective measures to combat the introduction of new plant pathogens and pests.

Professional travel has characterized the career of

Prof. Stakman. While studying the cereal rusts, he undertook scientific missions to Europe, to Alaska, and throughout the United States and Mexico for the U. S. Department of Agriculture. Inquiry into disease problems of rubber production in Liberia and establishment of a research laboratory for the Firestone Plantations Company in 1930 necessitated travel in West Africa and also a survey of rubber production in the Far East. During World War II, in the interests of national defense in the Western Hemisphere, Stakman joined a Department of Agriculture Commission to study native rubber in South America and the possibilities of increasing *Hevea* rubber production there. In 1941 he was a member of the Rockefeller Foundation's commission to survey agricultural needs in Mexico, and two years later he helped in the implementation of the Foundation's program for agricultural improvement. More recently he has assisted the Foundation in a survey of agricultural problems and status of education and research in the natural sciences in various countries of Central and South America. Late in 1948 he became a member of a commission of scientists from the National Academy appointed to assist Gen. MacArthur in a survey of scientific research institutions in Japan.

While Dr. Stakman is known primarily as a plant pathologist and agriculturalist, he also is a renowned educator. Graduate students and postdoctorate fellows from every continent in the world have studied in his laboratories and have gained an insight not only into the scientific fields of biology and agriculture but also into the broad cultural life of an American university and the history and development of the peoples of the United States. They have found intelligent consideration and sympathetic understanding of their own national or racial cultures and intense interest in their present and future problems.

The honor and responsibilities of the Association's presidency for 1949 have been well placed in the scientist Elvin Charles Stakman.

Research and the Development of Atomic Energy

Robert F. Bacher, *Member, U. S. Atomic Energy Commission*

RESEARCH IS THE BACKBONE of the development of atomic energy. While the development of atomic energy also depends upon a host of technological improvements and upon the strength of industrial development and management, the guidance of research is a necessary requirement. Today, the research carried on under the atomic energy project ranges through physics, chemistry, metallurgy, the biological sciences, medicine, and most of the branches of engineering. The shortage of trained scientific and technical personnel, due at least in part to these greatly expanded activities, has prompted the Atomic Energy Commission to establish fellowship programs in the physical sciences and in biology and medicine and to set up technical training programs in radiation effects and the use of radioactive isotopes.

The main work of the U. S. Atomic Energy Commission is carried on in several Divisions: the Division of Production, which includes the production of raw materials from which fissionable materials are made and the production of fissionable materials themselves; the Division of Military Application, which covers the research, development, and production of atomic weapons; two Research Divisions, one for the physical sciences and one for the biological and medical sciences; and the Division of Reactor Development. In addition, there are, of course, many supporting activities which are an important and necessary part of the general administrative organization.

Most of the work in atomic energy is conducted by contract with industrial companies, universities, research organizations, and other government agencies. The greater part of it is carried out in installations especially erected for that purpose, although some of it is located in installations owned by the various contractors. The Atomic Energy Commission plans and coordinates this work. It is very important, for example, that work in the production of fissionable materials keep abreast of the developments of atomic weapons and vice versa, and that research in reactor development take account of recent experiences in the production of fissionable materials in reactors.

Since a large part of the work of the atomic energy project is carried on in several large installations, these installations have formed centers for management. At Oak Ridge, for example, there is a Manager who is responsible for all of the activities there as well as for several other contracts either closely associated with the Oak Ridge work or located nearby. Similarly, there are Managers at Chicago, where the

Address delivered at the November 18, 1948, meeting of the Washington (D.C.) Academy of Sciences.