

*At a Meeting of the Faculty of Arts and Sciences on May 3, 2005, the following Minute was placed upon the records.*

## LAWRENCE BOGORAD

Born: August 29, 1921

Died: December 28, 2003

Harvard's Maria Moors Cabot Professor of Biology, *Emeritus*, Lawrence Bogorad, a pioneer in bringing the use of molecular biology to bear on problems in plant biology, died from a stroke December 28, 2003, at the age of 82.

In science, Bogorad will be remembered especially for his groundbreaking contributions to the understanding of chloroplast biogenesis, and fondly honored by five decades of graduate students, postdoctoral fellows, and visiting scientists who trained in his lab and whom he mentored, through example and unfailing support, into productive careers of their own. As a mentor he had a style that gave his students a vested, joyful, and productive sense of adventure in their projects.

Born in Tashkent, in what is now Uzbekistan, Bogorad came to the United States with his parents via Ellis Island two years later. He grew up in Chicago and attended the University of Chicago, but only through a fortunate turn of events. He had been accepted there but without financial aid, so had enrolled in the city college. During the summer a customer on his ice delivery route with connections at the University learned of this and arranged for a full scholarship.

After graduating in 1942 Laurie served in the U.S. Army, then returned to the University and earned a Ph.D. degree in botany in 1949. As a postdoctoral student in Sam Granick's lab at the Rockefeller Institute he initiated research using a combination of biochemical genetics and biochemistry to characterize the pathway of porphyrin biosynthesis, which he continued after returning to the University of Chicago as an assistant professor in 1953. His diversifying research included the role of chloroplast pigments in chromatic adaptation in plants, but when evidence for the presence of DNA in chloroplasts appeared in the 1960s, Bogorad immediately understood the importance of this genetic material in plastid biogenesis and physiology, and in the evolutionary pathway from endosymbiotic ancestor to modern-day chloroplasts.

Moving to Harvard in 1967, Bogorad took up the tools of molecular biology and his group led the charge showing that plant genes coding for chloroplast proteins were not all in the chloroplasts but distributed between nucleus and chloroplast. They constructed the first restriction map of chloroplast DNA, determined the first complete DNA sequence of a chloroplast gene for a known protein, and used DNA sequence data to identify key components of the photosynthetic apparatus even before some had been biochemically recognized.

Laurie had unusual foresight and helped organize influential symposia on the molecular biology of the photosynthetic apparatus (Strasbourg, 1976; Cold Spring Harbor, 1984). His leadership extended worldwide, including China after it reopened to the West, and these symposia helped focus and galvanize the efforts of the international community.

Bogorad took seriously the leadership responsibilities that his scientific successes thrust on him, serving as president of the American Society of Plant Physiologists (1969), the Society for Developmental Biology (1983), and in 1987 the world's largest science society, the American Association for the Advancement of Science. As a member of the Council on Food and Agricultural Sciences of the U.S. Department of Agriculture, his influence was essential in the establishment of the first competitive grants program of that agency.

Bogorad was elected to the American Academy of Arts and Sciences in 1968, the National Academy of Sciences in 1971, and the American Philosophical Society in 1985. At the National Academy he provided dedicated service to the important Committee on Science, Engineering, and Public Policy, the Space Studies Board, and the editorial board of the Proceedings of the National Academy of Sciences. As chairman of its editorial board (1991-1995), he increased the rigor of the journal's review process and effected a change in its cover from dull gray to far more useful and esthetically pleasing color images related to articles.

Bogorad recognized the power of molecular biology to generate improvements in agriculture, and that agribusiness could support basic plant research that would lead to scientific discovery. He played an important role in founding Advanced Genetic Systems, Inc., one of the first publicly traded agricultural biotechnology companies and served as a director of the Boyce Thompson Institute and on the science advisory board of Plant Genetic Systems in Belgium.

Among his awards, he cherished most the Quantrell Award for Excellence in undergraduate education that he received in 1959. Shortly before his death he learned that he was to be awarded the Medical and Biological Sciences Alumni Distinguished Service Award by the University of Chicago, bestowed posthumously in June, 2004.

Laurie was a warm, gregarious, and generous person whose manner of living was informed by his feelings of optimism and gratitude. Sophisticated in his appreciation of the ways of the world and the foibles of individual personalities, he nevertheless was confident in his ability to succeed in endeavors to which he dedicated himself. The optimism of his character inspired him to constantly embrace new challenges and, in so doing, he inspired others to do the same. He was profoundly grateful for both the talents that he possessed and the opportunities that he had been given, and especially grateful to be an American, living in a country so different from that of his birth. He loved the opportunities of the American educational system and the American scientific establishment, the beauty of the country, and the amazing talents of the Gershwins, the Marx brothers, and Fred Astaire. Until the day he died, he had an interminable

list of things that he wanted do, places that he wanted to visit, and books that he wanted to read. Writing of his own career decisions in 2001, "...my worst career error was to be born too early! I will miss the next exciting chapter in biology. This one has been wonderful to behold!"

Bogorad died while vacationing with his loving family in Puerto Vallarta, Mexico. He is survived by his wife of 60 years, Rosalyn, who suffers from Alzheimer's disease; by his daughter, Kiki Bogorad-Gross of Newton, Massachusetts; by his son Leonard of Bethesda, Maryland; by four grandchildren; and by his partner Kathleen Mullinix.

Respectfully submitted,

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