Sam Aronoff

Samuel Aronoff, a highly respected plant physiologist and celebrated plant biochemist, died February 2, 2010, at his home in Corvallis, Oreg. His wife, Edith Moyer, who was a chemist, died in 1997. Sam was born in New York City on February 27, 1915. His father, Isadore Aronoff, was a tailor, and his mother, Sonia Berchoffsky, a housewife. Sam's parents, who were Jewish, had emigrated from Russia. The family moved from New York to California, where Sam graduated from Venice High School at the age of 15. He then enrolled at the University of California, Los Angeles (UCLA), where he earned a bachelor of science degree in geology. On the recommendation of a college teacher, Sam obtained a job in the seismology lab at the University of California at Berkeley that he described for Vivian Moses on July 8, 1996, as follows: "sorting out a charcoaled piece of paper with a needle scratching through the charcoal…my job was to change it every day and file it." He then became a graduate student at the University of California at Berkeley (1937–1942) and studied under Gordon McKinney (known for his work on carotenes, and one of the best chromatographers in the world) and under Melvin Calvin, who later (1961) won a Nobel Prize in chemistry for his work on the path of carbon in photosynthesis.

Sam completed his doctoral thesis, *The Chemistry of Porphyrins in Relation to Chlorophyll,* in physicochemical biology in 1942. His work on photosynthesis and carbon fixation soon followed. During 1942–1943, and then again during 1946–1947, Sam served as a postdoctoral visitor in Melvin's laboratory. During his work at Berkeley, Sam wrote one of the early detailed papers on "Photochemical Reduction of Chloroplast Grana" (1); it was preceded by a paper in *Science* (2). Shortly thereafter, Sam wrote a paper with Melvin on "Phosphorus Turnover and Photosynthesis" (3). Here, Sam could not find any correlation between light exposure (in grana from spinach leaf, in tobacco leaves, and in green alga *Chlorella vulgaris*) and the formation of organic phosphate from radioactive inorganic phosphate, as was then expected from the ideas of F. Lipmann, S. Ruben, R. L. Emerson, and others. However, Sam was careful to point out that their conclusion would be subject to change if only 1%–10% of total organic phosphate was involved, or if light converted one form of organic phosphate to another organic phosphate.


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James Al Bassham, then working with Melvin and Andy Benson, remembers Sam for his contributions in growing algae. Al writes: "Sam was there only in about the first year of my joining the lab. Certainly Sam was important in establishing the algae cultures, which were very important to a large part of our subsequent research." Actually, Sam's official job was to grow algae! In a recent phone conversation, Andy remembered Sam as a great plant biologist as well as someone with a very good math background. He recalled Sam's important paper with him on the "Distribution of C^{14} in Photosynthesizing Barley Seedlings" (4). Sam's excellent mathematical skills were best demonstrated in a paper called "Catalase: Kinetics of Photooxidation" (5).

Sam taught chemistry at Boston University (1943–1944) to 200–300 students, whom he called an "auditorium of soldiers." He then did research with Hans Gaffron and James Franck at the University of Chicago (1945–1946) before his first tenured faculty position starting in 1948 in the Botany Department of the Iowa State University in Ames. At Ames, he later founded the Department of Biochemistry and made it his home for the next 20 years. His research during the late 1940s and early 1950s included studies on the "Degradation of Glucose-1-C^{14} and a Possible New Step in the Mechanism of Fermentation" (6), the "Separation of the Ionic Species of Lysine by Means of Partition Chromatography" (7), "A Homogeneous Cell Preparation from Soybean Leaves" (8), and "Carbon Dioxide Fixation by Roots" (9).

Among many other scientists, Leo P. Vernon started his research career in photosynthesis with Sam. In 1948, Leo used carbon-14 to follow the plant sugars formed in the leaf and tracked sucrose as the major sugar being translocated to the roots (10). Sam was a true plant physiologist; one of his early papers dealt with the metabolism of soybean leaves, in which he demonstrated the presence of organic acids produced in short-time photosynthesis (11). Sam's interest in the role of boron in plants is obvious from a novel paper called "Boron in Plants: A Biochemical Role" (12). Sam was involved in many aspects of *Plant Physiology;* the journal even included his work "Relative Kinetics of Chlorogenic and Caffeic Acids During the Onset of Boron Deficiency in Sunflower," published with John Dear (13).

Sam's 1956 book *Techniques of Radiobiochemistry* (14) served well in teaching hundreds of graduate students and young researchers during the time I was a graduate student and many years beyond my time. Sam left Ames to become the graduate dean and dean of the faculty of science at Boston College, a Jesuit college, and in 1971 he moved to Simon Fraser University in Vancouver,

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British Columbia, Canada, as professor and the dean of science. He retired there at age 67. He was an outstanding administrator. He organized several conferences and in 1974 coorganized, with Paul Gorham and Jack Dainty, a series of well-known international meetings on *Phloem Translocation* held in Banff, Alberta, Canada.

Sam served several professional organizations, especially the American Society of Plant Physiologists (now ASPB) as secretary (1961–1963), vice president (1963–1964), and finally president (1964–1965). He had hobbies, too: he played games such as soccer, handball, and touch football. I am told that he swam until he was in his 90s.

Sam is survived by his children, Zena Seldon of Kamloops, British Columbia; Elizabeth Aronoff of Corvallis; and Margaret Aronoff of Mission, British Columbia, and five grandchildren.

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