

George F. Estabrook
(11/1/1942 – 11/24/2011)

George F. Estabrook passed away on November 24, 2011 at his home in Ann Arbor, MI, following a lengthy struggle with prostate cancer. A memorial service was held at St. Andrew's Episcopal Church in Ann Arbor on November 29.



George was a longtime professor of botany at the University of Michigan (UM), where he was a specialist in the diversity and evolution of economic plants, and a pioneer in applying quantitative techniques to taxonomy and other facets of the life sciences. He was a superb educator and a man of exceptionally broad interests and activities, from mathematics to the history of food and agriculture, from ecology and sustainable development to religion, music, and athletics.

George was born on November 1, 1942 in Carlisle, PA, where his father had briefly been stationed as a member of the U.S. Army Air Corps (later the Air Force). His parents were both from Massachusetts, and George thought of himself as a New Englander even though his family relocated every year or two, all over the U.S. and to Germany.

George was essentially recruited by Dartmouth as part of a campaign to revamp and upgrade the mathematics program. A strength of the department, then as now, was in the applications of mathematics to other fields, such as the social sciences and life sciences. Apart from mathematics, which was George's major, he was passionately interested in how plants grow. However, in his biology courses he quickly came to the conclusion that little of real substance was yet understood, and that most biologists functioned on the principle that, "If you can't understand it, name it." Although he was not very good at memorizing plant names and other details, he was able to use his outstanding grades in mathematics to offset his poor grades in biology.

George was a natural athlete, and particularly excelled at running. After arriving at Dartmouth, he joined the track and ice hockey teams. However, he was released from the track team fairly early on after it became known that he'd gone skiing one weekend with his father, who was visiting: skiing was thought to present too heavy a risk of injury for runners. As for hockey, after failing to progress onto the varsity team, George played intramural hockey and led South Fayerweather to many victories. He also played trumpet in the marching band, and in the pit orchestra for some musicals.

After graduating in 1964 with a B.A. in mathematics, George taught for one year at Franklin Pierce College (Rindge, NH), then lived for two years in New York City, where he was a Research Associate at the New York Botanical Garden. It was during these years that he began to apply the mathematical theory of directed graphs, which he had studied at Dartmouth, to problems in taxonomic classification. He published important articles in the *Journal of Theoretical Biology* and *Systematic Zoology*. On the side, he

sang tenor for the New York Oratorio Society. He had also taken up “old timey” banjo and was part of the early folk and coffeehouse scenes in the city.

George received an M.A. in mathematics in 1969 at the University of Colorado at Boulder, with a dissertation on *Partial Orders in Phylogeny*. His dissertation advisor was then-department chairman Stanislaw Ulam, a world-renowned mathematician of Polish-Jewish origin, who had worked on the Manhattan Project and other bomb projects at Los Alamos. However, by this time Ulam’s interests had shifted to biomathematics, and he and his colleagues worked together with the young Estabrook in developing some of the earliest numerical models and quantification methods for the life sciences.

George would go on to use other mathematical techniques, including statistics, information theory, and the theory of lattices, to uncover the relation among plant and animal species, to analyze their rates of evolution and speciation, and to reconstruct their phylogenetic evolutionary trees.

Interestingly, George never undertook a program of doctoral studies. In 1968, one of his journal articles had attracted the attention of faculty members at the Univ. of Michigan, and they invited him to come and present a guest lecture there. Impressed, they offered him a temporary position at the UM Herbarium beginning in 1970, and over time the post became permanent, much to George’s surprise. He was named a Research Scientist at the Herbarium in 1976. That same year, in collaboration with Dartmouth’s Project COMPUTe, he published a book about techniques of computerized environmental measurement and analysis.

In the mid-1970’s, George married a fellow botanist at UM, Bronwen Gates. The couple would raise two sons and a daughter in Ann Arbor. Bronwen, who is a native of northern England, holds an undergraduate degree from Cambridge, a master’s from the City University of New York, and a Ph.D. from the University of Michigan. In 1995, she left UM to pursue a new career as an herbalist and healer.

In recognition of his path-breaking work and vigorous scholarship, George received a faculty appointment in UM’s Dept. of Ecology and Evolutionary Biology. Eventually he was granted tenure, and was promoted to Professor of Botany in 1983. During his career, he would publish over 120 journal articles and would chair the thesis committees for 16 Ph.D. biology students at UM. In recent years he was Senior Associate Editor of the journal *Economic Botany*, and Associate Editor of the *Journal of Systematics and Evolution*.

He was a skilful lecturer in the classroom, and in 1986 he received an award of Distinction for Outstanding Teaching at UM. His two basic courses were “Biology of Human Nutrition” and “How People Use Plants”. In addition, George developed and taught a statistics course for doctoral and post-doctoral students, which was based on his own ideas and techniques.

He also enjoyed volunteering to give presentations before non-specialist audiences. For example, on Martin Luther King, Jr., Day, when regular classes at UM are cancelled, he

would give an annual public lecture on “The Roots of Soul Food”, in which he analyzed traditional African American dishes for their nutritional profiles and their links to the diet of the slavery era. For the Culinary Historians of Ann Arbor, an organization to which he belonged, he gave illustrated talks on the origin and spread of various domesticated fruits. Once, he enthralled children at a local Montessori school with his true stories about edible plants and their history. The teachers wrote back thanking him and said, “You have amazing patience with children.”

A true son of Dartmouth, George focused his personal and professional life on green consciousness long before it became fashionable to do so. In Ann Arbor, he famously commuted to and from work on a rickety bicycle, and he sought out food that was local and organic. By 1990, he became interested in the ecology of the countryside in Portugal. Since the mid-1970’s he had been giving occasional talks, collaborating on various research projects, and organizing conferences in that country. Now he began spending summers and sabbaticals at the University of Coimbra, serving as an Invited Professor of Anthropology there and carrying out fieldwork on traditional agriculture in the remote mountainous interior.

In Portugal, George would observe and analyze centuries-old farming techniques to identify those practices that foster sustainability and that might be adaptable to more industrialized countries. He learned to speak fluent Portuguese and, more impressively, the rural mountain dialect, which is somewhat unintelligible to the rest of the country. Once, when an interviewer back at UM kept asking him how he was planning to “help” the Portuguese by teaching them what he knew, George made clear who was learning from whom: “I’m not there helping farmers at all. I’m there learning from farmers how they’ve managed to pull this off for the last 800 years.”

In later years, George continued to nurture his outside interests. He played soccer on an adult team, coached the sport for awhile, and for several years was a FIFA-certified referee for the public schools. He also ran marathons for about a decade until he developed back pains, which made the shorter running distances of triathlons more attractive. He was nationally ranked for his age class in the triathlon most years though 2007, when he was 65 years old. George took voice lessons for several years and sang with many local groups, mostly as a bass but sometimes as an alto. He played alto or tenor recorder as part of a trio sonata group, and more recently had taken up the autoharp purely for amusement. In the late 1990’s he had found a spiritual side to his life, and joined St. Andrew’s Episcopal Church.

George and Bronwen had separated years earlier, and around 2000 he met, and eventually married, Virginia E. Hutton, a young Univ. of Michigan doctoral student in biological anthropology. Eventually the new couple would have a son and daughter together. Specializing in the sub-discipline of paleoosteology, Virginia analyzed the bones found in collections of historical human skeletal remains in Portugal to learn about the medical and dietary consequences of the “Columbian exchange” between the Old and New Worlds, which began in 1492. To be able to spend more time in Portugal, George and Virginia purchased an apartment in the town of Torres Vedras, in the west central region

of Estremadura. Virginia went on to complete her Ph.D., and is currently a Lecturer in Anthropology at UM

It was in Portugal in March 2010 that George was diagnosed with advanced prostate cancer. Aggressive treatment there, and later in the U.S., was unsuccessful. He received hospice care, and kept up his church and many other activities until the end. By his preference, he came home from hospice for his final few days to be surrounded by family. Before his death, he was able to see a copy of his just-published book, *A Computational Approach to Statistical Argument in Ecology and Evolution* (Cambridge Univ. Press), a textbook based on his original course at UM.

George is survived by his first wife, Dr. Bronwen Gates, their children, Edward, 34, Ruth, 32, and George Fredrick and his second wife, Dr. Virginia Hutton Estabrook and their two children, Elizabeth (“Lili”) and Peter.

by Randy K. Schwartz
Dartmouth Class of 1978