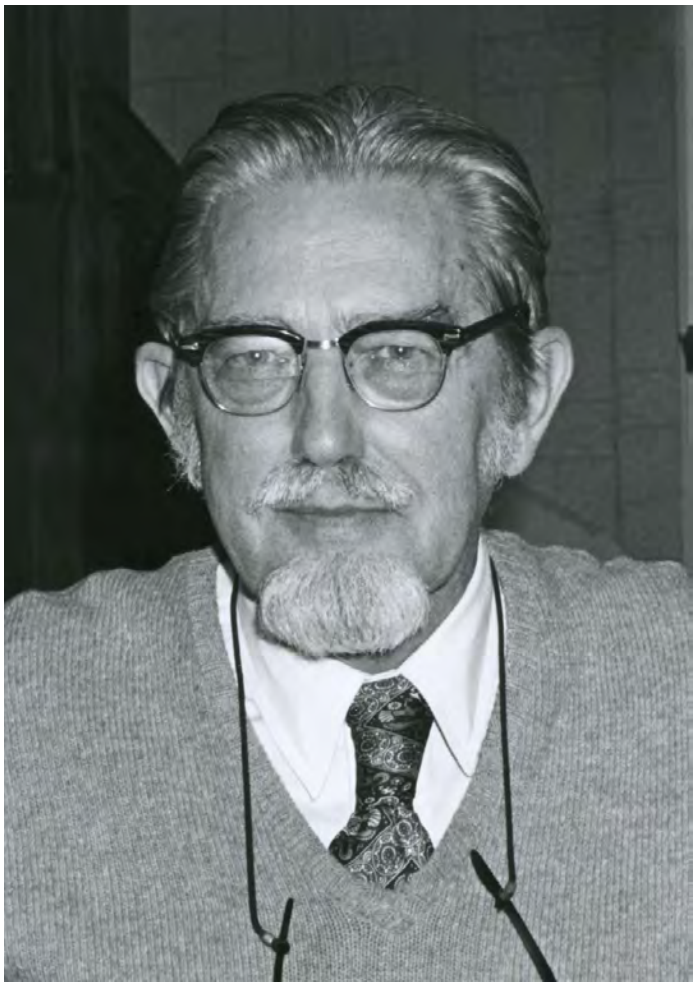
THE FACULTY OF MEDICINE
Harvard University

Don Wayne Fawcett



Don Wayne Fawcett, the Hersey Professor of Anatomy, emeritus, and former chair of the Department of Anatomy at Harvard Medical School, passed away at home on May 7, 2009. He was 92. Don Fawcett was born in Iowa, where his father raised sheep and cattle, but grew up in Boston, where his father moved when he became a wool merchant. Don Fawcett studied at the Boston Latin School, the oldest high school in the country, and was admitted to Harvard College in 1934, where he became fascinated with biology. In order to attend the football games for free, he played trumpet in the Harvard Band with Keith R. Porter, a schoolmate and his biology teaching assistant. Later, he, Porter and George E. Palade went on to found the American Society for Cell Biology. In 1938, Fawcett entered Harvard Medical School, where he did research as a medical student under George B. Wislocki, the chair of the Department of Anatomy. He received his MD in 1942 and, as a surgical house officer at the Massachusetts General Hospital, was on duty in the emergency ward when 300 people were severely burned in a fire at the Coconut Grove nightclub.

In 1943, after one year as an intern in surgery, he was commissioned a captain in the U.S. Army Medical Corps and served as a battalion surgeon in an artillery unit in the European theater in World War II. Upon his return, he chose a career in research and teaching rather than the practice of surgery and he became an instructor in the same department in which he had done his undergraduate research. There, he began to work on subjects that continued to interest him throughout the rest of his life: adipose tissue and the male reproductive system. He also recognized that the newly developing field of electron microscopy would powerfully extend the existing knowledge of cell and tissue structure as it provided a remarkable two order of magnitude increase over the resolution limits of the light microscope. The first commercial electron microscopes had become available early in the 1940's and Keith Porter had one at the Rockefeller Institute for Medical Research, now the Rockefeller University. Don Fawcett joined this group, which included

In tribute to their dedicated efforts to science and medicine, deceased members of the Harvard Faculty of Medicine (those at the rank of full or emeritus professor) receive a review of their life and contributions with a complete reflection, ***a Memorial Minute****.*

George Palade. There, as he reported in an unpublished autobiography, he "learned to break glass knives and to cut thin sections" and went on to describe for the first time the ultrastructure of cilia and sperm flagella in 1954. This was followed by a study of the fine structure of the hepatocyte and he published one of the earliest electron micrographs of virus-like particles in hepatomas.

He wrote about his junior faculty career, with typical modesty: "Success often does not depend upon special intellect or insight, but upon being involved early in a new and rapidly advancing field." About his research experience in those years he said: "for morphologists the decade from 1950 to 1960 held the same anticipation and excitement that attends the opening of a new continent for exploration. The electron microscope revealed marvelous order and functional design in the organization of every tissue and organ that was examined and added significantly to our understanding of our own structure . . . I am grateful to have been able to participate in a branch of science in which one can enjoy aesthetic satisfaction while wresting from nature some of her closely guarded secrets and contributing in some small measure to man's store of knowledge." He rapidly moved up the academic ladder at Harvard and in 1955 he was appointed to chair the Department of Anatomy at Cornell Medical School. There he built a thriving department and advanced his studies in electron microscopy. In 1959 he was recalled to head the Anatomy Department at Harvard, where he remained until his retirement in 1982. During his tenure, Fawcett rebuilt the Department in a substantive way. A generation of his pupils, which included graduate students, postdoctoral fellows, young faculty members and many foreign scientists, went on to occupy key academic positions of anatomy and biology in the U.S. and abroad.

Don Fawcett published over 200 papers on the ultrastructure of cells and organs and was the author of The Cell, an atlas of fine structure, and of several editions of a famous textbook of histology. Known as "The Bloom and Fawcett" to generations of students and young investigators, the book taught them the microscopic anatomy and histophysiology of the human body.

His long-standing interest in brown and white adipose cells was important in determining the role of these tissues in mammals. Further studies with A.L. Jones on the hypertrophy of the agranular endoplasmic reticulum of the hepatocyte in response to phenobarbital were noteworthy contributions to liver function. With J.P. Revel, he defined the remarkable structure of the sarcoplasmic reticulum in the fast-contracting skeletal muscle of the puffer fish. The corresponding organelle in the atrial and ventricular cardiac muscle fibers was described by him with N.S. McNutt. He also discovered the fibrous lamina of the cell nucleus.

The most extraordinary achievement of his career, however, was his description of the structure of spermatozoa and male reproductive system. He illustrated this work with some of the most extraordinary images of biological organization ever published. Fawcett's long time interest in the spermatozoon was initiated with his collaboration with M.H. Burgos when they described the fine structure and development of cat spermatids in 1955. This was followed by a publication on the differentiation of the spermatid in the toad in 1956. In 1965, Fawcett made a definitive contribution to reproductive biology with his landmark publication describing structure and differentiation of the sperm in the guinea pig. During the late 1960's and into the early 1980's, the great majority of his publications were on the anatomy and physiology of the testis, where he defined the structural basis of the blood-testis barrier by using electron-dense tracers, and on the histophysiology of other organs of the male reproductive system. Many of his faculty as well as numerous fellows, students, and foreign scientists were involved in these studies, including: A.K. Christensen, D.W. Hamilton, J.P. Revel, S. Ito, M. Dym, A.P. Hoffer,

R. Vitale, D. Phillips, P.M. Heidger, W.B. Neaves, A. Aoki, J. Pudney, J.H.E. Chemes, G.E. Olson, D.S .Friend, H. Hildebrandt-Stark, R. Jones, and M.A. Swann. Fawcett was in the forefront of these wondrous years of advances made by electron microscopy.

Throughout his life, Don Fawcett did his own experiments and much of his own microscopy. "The life of a professor," he commented, "is an endless series of faculty meetings, project site visits, research grant applications and other unproductive activities. However, I was able to continue my research by having a microtome in my home where I cut my own thin sections and a darkroom in the basement where I printed the micrographs." He was rarely satisfied with any photographic print unless he had done it himself. He started his day as department head at 9 a.m., having already spent hours at the electron microscope and he resumed his own work in the evening at home. A gifted writer, he would reappear in the Department after a weekend of work with a new paper or book chapter written in pencil in his impeccable handwriting on a yellow pad of paper, to the envy of all Department members.

In the mid 1960's, Don Fawcett was appointed as an examiner in the School of Veterinary Medicine at the University of Nairobi and thus began his long love affairs with Africa and photography. For years he would spend a month of his summer in Kenya, visiting the national parks and photographing mammals, birds, and flowers. His breathtaking photographic images of African and North American wildlife have been widely exhibited and published. In 1975, he was persuaded to relinquish his chairmanship of the Department of Anatomy to become the Senior Associate Dean for Preclinical Sciences. It was a job he didn't like, as he missed doing research, so he took a leave of absence from Harvard Medical School in 1977 and accepted a position as senior research scientist and director of electron microscopy at the International Laboratory for Research in Animal Diseases (ILRAD) in Nairobi. He could thus devote all his time to the greatest passion of his life, contemplating nature at all levels of organization.

The mission of ILRAD was to develop the means to control parasitic diseases of cattle, thus Don Fawcett switched to the study of the protozoan Theileria parva, which is responsible for the East Coast fever, a lethal infection of cattle. In addition to clarifying many erroneous interpretations of the earlier light microscopic studies of this parasite, he identified the mechanism of the entry of the protozoan into lymphocytes. He also found that former protein-secreting cells of tick salivary gland cells become transformed after a blood meal into fluid secreting cells, so that the tick vector eliminates the ingested excess fluid by secreting water back into the host. After five years in Kenya, he moved to Montana in 1988, where he lived for the remainder of his life.

Don Fawcett will be remembered and honored by his many disciples who were deeply influenced by his remarkable gifts as a scientist, mentor and department head. His intellect, imagination, and vast understanding of zoology and comparative physiology had a unique impact on students, postdoctoral fellows and faculty. For Don Fawcett, looking at living things, in the large as well as the small, was an adventure that never ceased fascinating him, even into the last years of his life. Tolerant of human frailness, endowed with an excellent sense of humor, full of understatement about his gifts and accomplishments, he detested pomposity in all its manifestations. He also distinguished himself in another important respect: he appointed the first woman and the second African-American professor in a preclinical department at Harvard Medical School. And, as the Associate Dean for Preclinical Sciences, he chose as his successor the first woman to occupy a departmental chair in a preclinical department.

Don Fawcett is survived by his wife of 68 years, Dorothy Secrest Fawcett, his sons, Bob Fawcett (NH)

and Joe Fawcett (MT), two daughters, Mary Papish (Hawaii) and Dona Aitken (MT), a nephew, Ken Fawcett (Iowa), 13 grandchildren, and 10 great grandchildren. Fellow scientists and academic friends around the world will remember him not only for his major contributions to our knowledge of cells and tissues but also for his forthright and collegial manner.

Respectfully submitted,

Elio Raviola, *Chairperson*
S. James Adelstein
Susumu Ito