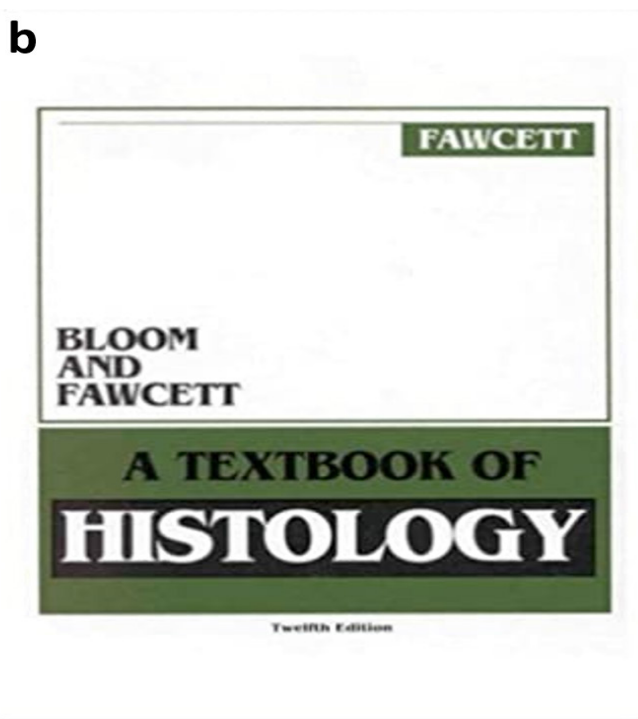
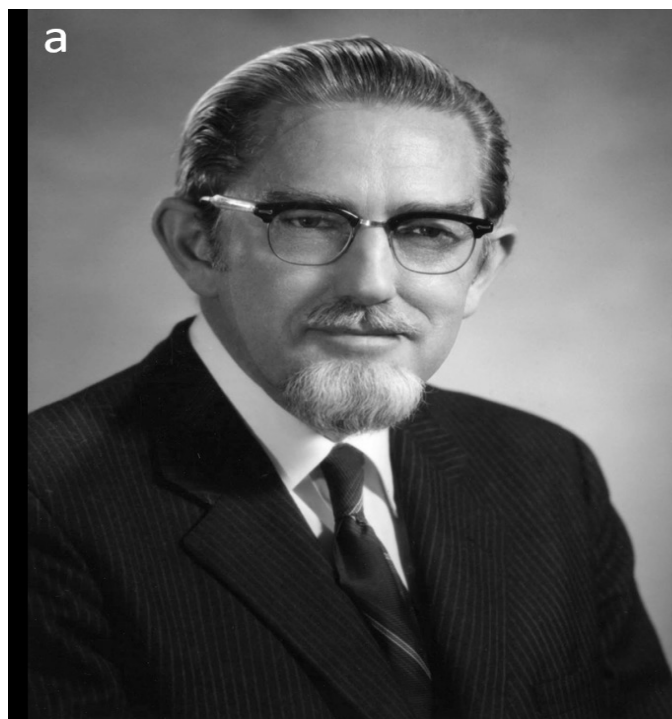


## DON FAWCETT: AN ARTIST IN ELECTRON MICROSCOPY

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What is electron microscopy? Who needs electron microscopy? Do we realize that our current knowledge on basic processes in the human and animal body is strongly based on electron microscopic details? Today, electron microscopy seems to be history, and in a way, it is. On the other hand, it is the present, and why not, the future, as Don Fawcett showed many tears ago. Who is Don Fawcett and what he did? Let's have a short look.

Donald Wayne Fawcett was born at a farm in Springdale, Iowa, in 1917. As the family moved to Boston, the young Donald attended a famous high school, the Boston Latin School, the oldest high school from the United States. After that, he was enrolled at the Harvard College (1934) and then to the Harvard Medical School, in 1938. Fawcett graduate Harvard Medical School in 1942, and even from his medical studies he was involved in research in the Department of Anatomy, under the supervision of Professor George Wislocki. He was captain in the US army medical corps during the World War II, but coming back, he returned to Harvard till 1955. Immediately after the World War II, he worked particularly on adipose tissue and the male genital system. Don Fawcett became the Chair of the Department of Anatomy at Cornell University in 1955, and in 1959 he moved back in Harvard, to chair the precursor department of Cell Biology, till his retirement in 1982.

In 1975, he relinquished his chairmanship and became the Senior Associate Dean for Preclinical Sciences (Ito and Raviola, 2009). Notably, the Cell Biology as individual science and department was not yet organized.

As a pure morphologist, he lived and worked in the era of the electron microscopy, and in this field, he had a close collaboration with Keith Porter and George Emil Palade from Rockefeller Institute. Fawcett published more than 200 papers on the fine structure of cells, tissues, and organs. Perhaps this is why his textbook of histology still includes the best electron micrographs which are very helpful to understand the normal structure of the human (and animal) body (Fawcett, 1998). Most of these pictures were included in the atlas of subcellular fine structures, entitled *The Cell* (Fawcett, 1966). I cannot imagine today how Fawcett succeeded to routinely cut thin sections at home using a microtome with diamond blades, but it seems that he did it (Marincola, 2009).

Together with Porter and Palade, Fawcett was recognized worldwide as leader in the use of electron microscope, and even more, founder of the modern Cell Biology. Based on his discoveries, and spreading knowledge on cell biology, Don Fawcett has been elected as the first President of the American Society of Cell Biology in 1961

Fawcett was the first researcher that observed and described the 9+2 model of microtubules within cilia. He published many other findings, like mitochondria, skeletal and cardiac muscle, brown adipose tissue (I still use the micrograph during students' lecture), hepatocytes, and spermatozoa (it is the first description of the human spermatozoa) (<https://cellbio.med.harvard.edu/biography-donald-w-fawcett>). His observations on zonula occludens in the intestinal epithelium on freeze-fracture preparations were not only spectacular, but also helpful to understand the ultrastructural organization of the intestine in normal and pathological conditions.

Maybe of interest at present time, Fawcett described for the first-time virus-like particles in tumor cells of hepatoma. His studies on the male reproductive system included gametogenesis, the junctional specializations of the Sertoli cells, and the blood – testis barrier (Ito and Raviola, 2009).

Analyzing the contribution of Don Fawcett to the development of Cell Biology, it is not a surprise that Harvard Medical School introduced Fawcett Lectures to stimulate younger researchers to work in this field. He had a real talent to select younger people to work in the lab of cell biology, like Susumu Ito or Tom Pollard. Although he retired in 1981, he remained very active. He loved very much animals, and this is why he spent some time every year in Africa. In 1985 he left Boston, to join an International Laboratory on Research and Animal Diseases, in Nairobi. In this lab, he worked in parasitology, fighting against severe diseases that killed thousands of animals in Central and East Africa (Marincola, 2009). He found some specific aspects of the parasites involved in the East coast fever (Ito and Raviola, 2009).

More than 50 years after he published first edition of his remarkable books, and more than ten years after he passed away (2009), the work of Donald Fawcett is still useful for new generation of students, biologists, and physicians.

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