Elisabeth Gantt

How did you spend your career?

In 1958, after graduating from Blackburn College, a work college in Illinois, my hope was to become a biology teacher at the high school level. This was considered a realistic aspiration for a woman, because at that time independent women scientists were extremely rare. As part of my preparation at Northwestern University, I felt that I should enhance my knowledge in plant biology, and thus, under the tutelage of Howard J. Arnott, a recent young professor from the University of California, Berkeley, I became exposed to plant biology, with great appreciation for Katherine Esau's excellent *Plant Anatomy* (1953).

Upon receiving my PhD in 1963, I worked as a technician at Dartmouth Medical School, with an eventual promotion to postdoctoral status in the Microbiology Department with Samuel Conti, exploring the photosynthetic apparatus of red and blue-green algae. Work in this area was continued at the Radiation Biology Laboratory of the Smithsonian Institution in 1967 and was expanded and enhanced until 1988, when I joined the Department of Botany at the University of Maryland, College Park (UMCP). There, I officially became a professor with teaching opportunities and interacted with several excellent plant biologists. Upon my official retirement from UMCP in 2007, I continued research as an emeritus professor, and in 2015 I was fortunately able to continue some research through the courtesy of being provided laboratory space at Roanoke College in Virginia.

What do you consider to be your most important contributions to plant science?

For my PhD research, I explored cell differentiation from the germinating ostrich fern *(Matteuccia struthiopteris)* spore to the development of the young gametophyte. Whereas the cell biology of these early cell stages was intellectually captivating, the methods for further explorations became available only in later decades. In the Microbiology Department at Dartmouth Medical School, I began to explore the reported absence of mitochondria in red algae. Through electron microscopy, it became apparent that they indeed existed in red algae but lacked the classical profile as illustrated in biology texts.

Of special interest became the unusual electron-dense bodies observed on the stromal side of the thylakoid membranes, as they were unlike anything observed in the green plant chloroplast. They were removed along with the disappearance of the prominent red phycoerythrin and blue phycocyanin. These complexes, which we named phycobilisomes, are now known to be unique photosynthetic complexes in red algae and cyanobacteria. They absorb light at wavelengths from blue-green to orange-red, where chlorophyll *a* is virtually blind, and transfer the energy mostly to photosystem II. Their isolation and structural composition led to further explorations of their physiological function, which is of singular importance to photosynthesis. This required the development and application of many different techniques.

At the Smithsonian Institution, PhD students were not as available as they are in university departments, and research funding from NSF, NIH, and most other agencies was not as available to individual scientists. Fortunately, the Atomic Energy Commission (now DOE) had a small grant program that enabled me to begin working with a recent undergraduate, Claudia Lipschultz, from the University of Chicago. This became a very meaningful, long-standing association and was enhanced by interactions with international scientists with overlapping interests and later with graduate students at the University of Maryland. The international scientists included individuals from France (J. Clement-Metral), Japan (Y. Fujita, T. Katoh, M. Mimuro), Canada (B. R. Green), Poland (D. Frackowiak, J. Grabowski), Hungary

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(L. Mustardy), and Israel (I. Levy, A. Vonshak). It was also satisfying to explore the carotenoid pigmentation of a red algae, *Porphyridium cruentum,* and of several cyanobacteria with F. X. Cunningham and several collaborators.

When did you become a member of ASPP/ASPB?

My professional associations were initially with the Botanical Society of America, the American Institute of Biological Sciences, and especially the Phycological Society of America. Although I did not have the imprimatur of having been trained in either phycology or physiology, certain senior scientists were inclusive in recognizing crossovers. I am grateful to two in particular, George F. Papenfuss, a beloved phycologist at UC Berkeley, and Martin Gibbs, editor-in-chief of *Plant Physiology* (1963–1992). Gibbs, together with William H. Klein, director of the Smithsonian Institution Radiation Biology Lab, and Winifred Klein, a dedicated volunteer, were instrumental in operating ASPP (out of the Kleins' basement, and then at the Radiation Biology Lab in Rockville, Maryland) until its official office opened in 1973 at the Federation of American Societies of Experimental Biologists in Rockville. Being located so closely to ASPP, I joined the Society in 1969, the same year I published a paper in *Plant Physiology*.

How did the Society impact your career, and what motivated you to become a Founding Member of the Legacy Society?

With only a few miles' distance to the first ASPP office and to the current headquarters, it was a singular opportunity for me to serve in many ways on committees and meet and interact with many Society members. I also served ASPP/ASPB in various other ways, including as a visitor to congressional offices on behalf of plant biology and as liaison with related societies. Whereas it was my pleasure to serve the Society in multiple ways, it was particularly satisfying to have been able to serve as its first female president in 1988.

What important advice would you give to individuals at the start of their career in plant science?

I would advise that if you are not fully interested in various phases of biology, then perhaps it is best to look around for something that is truly interesting to you. Curiosity and flexibility are two essentials, because they are critical for participation in any of the sciences, especially in the current political environment. If you should happen to be in charge of running a laboratory, your obligation is to be fair to the participants. Do not compete with them, and encourage them to work toward their own potential. Good science requires honesty at all levels. Thus, be honest with yourself, your coworkers, and your competitors.

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