



Natalie W. Uhl

April 28, 1919 – March 28, 2017

Natalie Whitford Uhl was born in 1919 and raised on a farm in Rhode Island, the oldest of three girls. Her mother died when Natalie was nine years old, which was perhaps instrumental in developing some of her personal characteristics such as responsibility, independence, persistence, and optimism. For a woman aspiring to become a scientist in post-World War II America, these were indispensable qualities. As Natalie described it: “It was a no-nonsense man’s world that I grew up in.”

Natalie entered Rhode Island State College in 1936. Vernon Cheadle was her advisor there, and fostered her interest in botany and especially the monocots. She worked as a technician in his laboratory during her senior year, and this work was subsequently published as two papers on phloem (Cheadle and Whitford 1940, 1941). After receiving her bachelor’s degree, she came to Cornell in September of 1940 and began working on an M.S. in botany under Arthur J. Eames. These were the war years, and with most of the men in the military, the labor shortage was filled by women. Natalie thus spent her summers working on her father’s farm in Rhode Island as a tractor driver. She nonetheless managed to pursue her academic interests by working evenings and weekends with Dr. Cheadle on the anatomy of monocotyledons. Tractor driver by day, botanist by night, Natalie remembers this as an ideal time in her life, plowing fields in the sunshine along the coast all day, sometimes punctuated with a swim or a lobster cookout on the beach, followed by an evening at the microtome or microscope studying plant anatomy. She and Cheadle would go collect plants on Sundays, Dr. Cheadle would identify them on Monday, and Natalie would begin the fixing and processing of them for anatomical work that evening. This work also led to two papers (Cheadle and Uhl 1948a, b), this time on vascular bundles in the monocotyledons.

Even with summers away from Cornell, Natalie finished her master's thesis in 1943, an anatomical study of *Potamogeton* and *Najas*. She began her Ph.D. program with Eames the same year, but the war intervened yet again. This time the University of Buffalo needed someone to teach botany and bacteriology while their full-time professor was away in the Canadian Air Force. Natalie had majored in botany and minored in bacteriology, and was quickly dispatched to Buffalo in 1945 to spend the year teaching. Her graduate studies resumed at Cornell in 1946, and she completed her Ph.D. in 1947, a study of the floral morphology and anatomy of the Helobiae. Although this work was never published, P. B. Tomlinson had this to say about Natalie's thesis in his supporting letter: "In my work on aquatic monocotyledons I had the good fortune to have a loaned copy of [Natalie's] thesis on the Helobiae (Alismatidae) at hand. Her discussions of morphological questions arising from the reduced and modified state of these plants proved foundational for my own work."

Natalie married Charles Uhl in 1945 on VJ Day, and was eight months pregnant with their first child when she defended her thesis. Charlie was hired as an assistant professor at Cornell after the war, and so the young family remained in Ithaca. This began a 13-year hiatus from academia while Natalie raised four children. When I asked her about why she was unable to continue working as a botanist, she identified two main factors. The first was that it was a lot of work having children in those days. There were no clothes dryers, no microwave ovens, and no disposable diapers. There were bottles to sterilize, dinners to cook from scratch, and errands to run. Hired help was expensive and hard to find. So there simply wasn't any time to think about or write up her research, much less initiate new projects. The second factor was that there were few available jobs for the men who came back from fighting the war. Indeed, there were few jobs for technicians, postdocs, or research associates. The NSF was not started until 1950, and the budget was quite small until 1959, when Congress increased it from \$34 million to \$134 million in response to Sputnik. Natalie was fond of saying that she owed her career to Sputnik because NSF made it possible for her to reignite her academic career.

Harold E. Moore was on the faculty of the Bailey Hortorium at Cornell when in 1962 he received an NSF grant to work on palm taxonomy. He offered Natalie a position as a Research Associate, and she began working part-time in 1963, when her youngest daughter was five years old. This opportunity began a fruitful collaboration between Natalie and Hal Moore, which was to end only with his untimely death in 1980. Moore and Uhl met every morning at 10 A.M. for coffee to discuss issues that Natalie was able to answer with her elegant anatomical studies. They published numerous papers on palm anatomy and morphology, and the importance of this work is best summarized by William J. Baker at Kew, who said "Natalie proceeded to publish prolifically, providing the botanical community with much needed accounts of her meticulous research on palm anatomy. In particular, Natalie's elegant work on floral ontogeny has provided the foundation for our current understanding of flower structure and floral cluster architecture in palms."

In many of her papers, the primary questions were about the homology of structures, which led naturally to an important paper on the evolution of palms, and the monocots in general published with Hal Moore in 1973. Natalie had also found numerous structural differences in the flowers in the form of raphides, tannins, and fibers, which led to a functional morphology paper (also co-

authored with Hal Moore) in which these structures were hypothesized to protect pollen and ovules.

When Hal Moore died in the fall of 1980, he left many unfinished projects. Natalie had spent hours discussing the palms with Hal and was as expert with their taxonomy as she was with their morphology and anatomy, so she was able to take up where he left off. She finished two of their papers after Moore died, a review paper on the evolution of palms (published in 1982) and a major opus on the palms of New Caledonia (published in 1984). Perhaps the most challenging project Hal left behind was *Genera Palmarum*, which they had envisioned as a comprehensive review of the taxonomy, morphology, and anatomy of all palm genera. The Liberty H. Bailey Hortorium was determined to carry on with this project, started half a century earlier by Bailey himself, and John Dransfield, the palm taxonomist at Kew, was chosen as a new collaborator. With the assistance of David Bates, who was then director of the Hortorium, Natalie and John received NSF funding, and began work on *GP* in the fall of 1981, only one year after Hal's death. John would spend two months each year in Ithaca. He described their collaboration as follows: "Natalie was critical and meticulous throughout, innovative, supportive, and always a delight to work with. For me, the writing of *Genera Palmarum* and the increasingly close collaboration with Natalie represent the highlights of my scientific career." The book was finished in 1987 and its affects are still being felt today. To quote from several letters: "*Genera Palmarum* was a tremendous stimulant to palm research all over the world...I can say with certainty that *GP* was the most significant contribution to palm taxonomy of the 20th century." "An incomparable work in detail and excellence, few other botanical publications come close to the scientific standard set in *Genera Palmarum*." "The book is now regarded as the bible of modern palm taxonomy and is destined to be a classic."

Natalie and John deservedly received the Engler Medal in 1990 from the IAPT for this monumental publication. It would have been understandable if Natalie, who was 68 at the time of the publication of *GP*, had decided to rest on her laurels. Although formally retired in 1987, she maintained her activities as an instructor, supervisor of graduate students, curator, and researcher. Indeed, she undertook the first family-level cladistic analysis of the palms, a project that would challenge her to learn new methods and techniques. Not only was this the first study to use molecular data (from chloroplast DNA restriction sites) to study higher-level relationships in the palms, but it was the first cladistic analysis of the group at the generic level, and it incorporated a morphological data set based on her encyclopedic knowledge of palms. As one supporting letter put it: "That paper, founded on the information base established in *Genera Palmarum*, set the standard for breadth and depth of sampling for phylogenetic studies of this large, complex family, and its conclusions have become the benchmark for subsequent studies." It also exemplifies Natalie's particular strength — integrating systematics and structural botany.

Natalie's accomplishments extended beyond her considerable contributions in the taxonomy of palms. She was co-editor with John Dransfield of the journal *Principes* (now *Palms*) from 1979 to 2000. During that time "Natalie maintained the highest possible editorial and scientific standards for *Principes*...Her work as co-editor was so appreciated by members of the International Palm Society that...she was awarded the Society's Dent Smith Memorial Award for outstanding contributions to the world of palms." Many of her colleagues commented on how

much time and energy she devoted to the journal, and the care she took to insure that the journal remained scholarly and highly respected.

Natalie was a Senior Research Associate at Cornell at the time of Moore's death, but was appointed as an Associate Professor in 1981. This allowed her to teach Applied Plant Anatomy, a course especially designed for taxonomists. Although not formally teaching until late in her career, she had a great and long influence as a mentor to many graduate students and young faculty, and many letters mentioned the pivotal role Natalie played in their careers. Descriptors range from "excellent role model" to "godmother to those of us in the palm community." As Scott Zona put it: "Those of us working in palm systematics are grateful that Natalie has gone ahead of us and blazed the trail. Her published work is a tangible measure of her contribution to botany, but her mentoring of students is an ineffable and no less important gift to our science."

Natalie was able to become a distinguished scientist while successfully raising a family of four children. Her oldest daughter is an M.D., her youngest a veterinarian, her middle daughter a writer, and her son a historic preservationist. As one person put it: "She combined two careers, as a mother and a scientist, and been eminently successful at both." She attributed her success in part to the constant support and encouragement of her husband Charlie, who kept her from taking "second class jobs" and whose immense scholarship contributed to the quality of her own work. Natalie also considered herself to have been fortunate in having worked with so many famous botanists during the course of her career. Her path to success was not the traditional one in academics, but few women had access to that path in the 1940's. Today, when we see men and women tackling the same issues of balancing work and family, it is a great inspiration to know someone like Natalie was able to lead a full and happy life without sacrificing her intellectual pursuits (or vice-versa). Among her many awards and honors, Dr. Uhl was awarded the Robert Allerton award in 2003 by the National Tropical Botanical garden in recognition for her lifetime achievements in the plant sciences. She was also the recipient a Botanical Society of America Centennial award in 2007 and the first woman to ever receive the Asa Gray Award, the highest recognition given to a plant scientist by the American Society of Plant Taxonomists.

Natalie was a beloved member of the Cornell faculty. She will be missed but not forgotten by those who were fortunate enough to have known her, or by those who have or will read her seminal scientific papers and book.

Written by Melissa Luckow and Edward D. Cobb