

THE SAVAGE GARDEN: “LLOYDIE”

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It is almost hard to believe that nearly two generations passed – or 67 years – between the publication of Charles Darwin's *Insectivorous Plants* in 1875 and F. E. Lloyd's *The Carnivorous Plants* in 1942.

We all know who Chuck Darwin was. But who was Francis Ernest Lloyd? These days, with computers and the internet and a growing volume of popular and scientific books on carnivorous plants (CP), many younger hobbyists have never heard of Lloyd or read his famous book, not realizing that we all stand on his shoulders as we peer ever further into the constantly expanding world of these truly marvelous flora.

Those of us who are middle-aged and beyond, and who have had an interest in CP since an early age, are much more inclined to be familiar with Lloyd's seminal work. During and prior to the slow re-emergence of interest in these strange and haunting plants in the 1970s, there was scant information for the curious or obsessed. We had Darwin's work, a couple of National Geographic articles from the late 1950s and mid-1960s, one children's book (Lynn and Gray Poole's *Insect-Eating Plants* in 1963) and Rica Erickson's 1968 *Plants of Prey*, an obscure but beautifully illustrated book on CP of Australia.

But then there was Lloyd. His amazing scientific work carried forward Darwin's research to a mere 30 years prior. As a kid in high school, I devoured it many a time. But who was F. E. Lloyd? Some well-respected botanist of the days of old was all I really knew.

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A few years ago a good-looking middle-aged woman came into my nursery, California Carnivores, and spent some time admiring our plants. After awhile she came up to me and said something like, “Hello. Your nursery is amazing! My name is Mardi Lloyd. I'm Francis Lloyd's granddaughter. Are you familiar with him?”

I almost fell out of my chair. My enthusiasm must have been rather explosive, because Mardi's excitement nearly matched mine. Francis Lloyd's granddaughter! I had a hundred questions for her and we chatted for quite awhile. I knew this was a chance to find out who the person of F. E. Lloyd was, a chance for him to become more than just a name on a book that I so admired. Later Mardi sent a framed photograph of her grandfather which sits in the nursery next to Darwin's. She was no doubt very proud of him. At that first meeting Mardi said, “Our family calls him Lloydie.” Lloydie. How cute. He was becoming more real already!

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If Lloyd had been in a different line of science, I might use the adjective “astronomical” to describe his life's accomplishments. But here I can only be brief and highlight some of his life and work.

He was born in Manchester, England on October 4, 1868 to Welsh parents, who immigrated to the United States while Lloydie was but a tot. After finishing high school in Philadelphia he briefly was a dental assistant, apprentice watchmaker, and a “cow puncher” (I don't want to know what that is!). For awhile he became religious, perhaps feeling guilty after punching all those cows, and decided to enter the ministry and pursue his education at Princeton University in New Jersey. It was at Princeton that he converted to science and specifically botany.

After graduating in 1895, Lloyd went to Germany and did graduate studies in Bonn and Munich, where he befriended his teacher Karl Von Goebel. Much later, after Goebel died in 1932, Lloyd would dedicate *The Carnivorous Plants* to his mentor. Goebel himself was famous in botany for his work *Organography of Plants* where he argued that evolutionary forms followed a change in function. Goebel gave Lloyd an extensive herbarium of *Utricularia* he had collected in his world travels.

Lloyd returned to America and taught at several universities from Oregon to New York. At Columbia University he wrote a popular book on how to teach biology. While teaching, he published

many botanical papers on subjects like morphology and embryology. His interests varied, once writing about the creation of hailstones and how timbers rotted in coal mines.

Also at Columbia, Lloyd met and married Mary Elizabeth Hart, a fellow teacher of biology. More about Mary later.

Next, Lloyd pursued research. He went to the Carnegie Institute's Desert Laboratory in the Arizona Territory and later moved to Mexico, then wrote a monograph on "Guayule: a Rubber Plant of the Chihuahuan Desert". He would remain a consultant for the rubber industry for two decades. He also wrote "Physiology of Stomata" in 1908, which one reviewer called "notable not only for its positive contributions to the knowledge of the stomatal mechanism, but also for the iconoclastic glee with which the teleological assumption of perfect regulation of transpiration by stomata is discredited." My goodness, Lloydie was on a roll!

Lloyd ended up at McGill University in Montreal, Canada, where he chaired the botany department until 1934. What he enjoyed most was the mystery of plant physiology, and was noted to work in his laboratory until well past midnight, most often over a microscope. (This would later take its toll.) He made the first important motion pictures of the workings of *Utricularia* traps, which amazed his colleagues and so fascinated him, much of the years that followed were dedicated to the study of the bladderworts, and finally all the carnivorous plants. During his years at McGill, he was President of the Royal Society of Canada ("the highest recognition which the country of his adoption could award", wrote a colleague) and an honorary degree from the University of Wales ("which moved him most of all his honors, for he was a Welshman at heart."). He was the editor of *Plant Physiology* for many years as well.

Lloyd retired in 1934, took a world trip with his wife Mary, a retirement gift from his colleagues. During this long voyage he studied many carnivorous plants in the wild, from Africa to Australia. Upon their return, the Lloyds settled in Carmel-by-the-Sea in California. This was where he wrote *The Carnivorous Plants*.

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For nearly forty years, *The Carnivorous Plants* remained the only popular scientific book on the subject, and it remains vivid, engrossing and very well written. Published as World War II was exploding, photographs were unfortunately reduced to small black and white pictures confined to the back of the book due to constraints in costs. Lloyd's own line drawings clearly illustrate details of cell structure and other things scientific, for this is a science book, not one on horticulture. Each chapter gives a brief introduction to the genus in question, then proceeds to review various scientific papers published by researchers over the previous decades, many by Lloyd himself and other well known botanists. From this he draws conclusions, and often raises many questions.

There are a few things particularly noteworthy in this book. One is that in his introduction, Lloyd dismissed *Roridula* from the group of carnivorous plants, since he could find no way for the plants to absorb nutrients without digestive enzymes. He was aware of assassin bugs and crab spiders living on the plants, as he discussed in his original paper *Is Roridula a Carnivorous Plant?*, and felt they deserved further study. We now know the plants absorb the fecal remains of these bugs. Another interesting highlight is his chapter on carnivorous fungi, a subject rarely seen in popular CP books. But it is his startling chapters on his true love, *Utricularia*, much of it based on his own detailed research, for which Lloyd is so well regarded. In the appendix of the chapter on the bladderwort trap, he offers an amazing illustration and step-by-step detail of the functioning of this "pretty complex bit of mechanism".

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Francis and Mary had two sons, Francis Jr., known as Frank, and David, who went on to become a notable neurophysiologist at the Rockefeller Institution and a Rhodes Scholar. Frank had an interest in science, but never pursued it. He had four children: Jennefer, Skip, Cindy, and Mardi, the youngest. After Mardi's visit, and a return with her sister Cindy, I received friendly emails from them about memories and stories of their grandfather.

Cindy was six when Lloyd died in 1947, and offered some vivid early recollections of his retirement in Carmel. Mardi was much younger, but recalled stories from her parents.

"I recall pitcher plants growing outside the Lab's door. I used to think if I put my finger in one, it would bite me," Cindy later wrote. "He collected spiders kept in jars in the Lab," and she enjoyed shaking them to make the black widows move. She loved to play with his lab equipment, taking apart eye pieces and apertures of his microscope. "Never did he quell my curiosity or interest. One day I showed up naked for tea. He told Mom he never wanted me to change my uninhibited personality!" Cindy became a registered nurse and Master Gardener when she grew up.

Lloyd, on the other hand, always dressed formally, “wearing three piece suits daily,” Cindy recalled. “We would listen to opera on the radio and have afternoon tea.” Lloyd enjoyed performing in plays produced outdoors by a local civic group, once photographed in Indian dress. Their house was of dark wood, with a Steinway piano, grandfather clock, radio cabinet, and Persian rugs Lloyd collected in their travels, along with other heirlooms.

Mardi, who has a talent for lovely botanical and landscape art, told me Lloydie suffered from headaches, blamed on his hours of microscope work as he researched stomata and bladderworts and fungi. His wife Mary often read to him, to give his eyes a rest.

Mary Hart, as a biologist and teacher herself, shared Lloyd’s life and interest in the natural world. Lloydie was deeply in love with her, inscribing books to “Merrie Heart”. Grandson Skip described their relationship as “an interesting, loving and intellectual ride for both.”

One thing unknown to the public or in printed biographies on Lloyd, was that this was Lloyd’s second marriage. During the 1890s he married an “opera singer”, name unknown. This first marriage was brief. On a trip they took to Germany, she had a ship-board affair, and Lloyd divorced her.

Mardi also heard that her grandfather was known to shout and lose his temper at times. In a memorial written by a colleague, it was written: “He had the temperament of an emotional artist. Before every important lecture he was as nervous as an actor waiting to go on stage,” until the audience warmed up to him, “as they always did.” Once, at a Scottish memorial for the fallen of the First World War, he openly wept. “While his manner could on occasion be bluff and his feelings might be relieved by a ‘bawling out’ given in forceful language, his bark was far worse than his bite for he was essentially a kind man” known for “his personal charm, story telling, and utterance of drolleries which attracted a world-wide circle of friends”.

In 1947, five years after the publication of *The Carnivorous Plants*, Francis Ernest Lloyd passed on. He was 79 years old.

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I would like to thank F. E. Lloyd’s grandchildren for their enthusiasm in helping me know the author of *The Carnivorous Plants* as a human being. California Carnivores’ volunteer and friend, Patrick Hollingsworth, provided much researched material. The memorial quotes were taken from an essay written by Dr. George W. Scarth of McGill University for *Plant Physiology*, Volume 23, page 1 (1948). Damon Collingsworth helped with technical matters.

The End



Figure 1: Goebel on the far left and Lloydie is second from the right.