

Medicinal
Plants
and the
Legacy of
Richard E.
Schultes

Bruce E. Ponman and Rainer W. Bussmann, Editors

Copyright © 2012
The William L. Brown Center
at the Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166-0299
USA

Impreso en GRAFICART SRL
San Martín 375 - Trujillo, Perú

ISBN-10: 0984841520
ISBN-13: 978-0-9848415-2-3

Hecho el Depósito Legal en la Biblioteca Nacional del Perú N° 2012-07285
Primera edición, Trujillo, Perú, mayo del 2012

Impreso en Perú
Printed in the Peru

Front cover photo by Richard E. Schultes.
Back cover image: Painting of R.E. Schultes in the Nash Laboratory, by Hannah Barrett.
Courtesy of Harvard University Herbaria.

Reflections on Richard Evans Schultes, the Society for Economic Botany, and the Trajectory of Ethnobotanical Research

Michael J. Balick^{1,2}

The life and work of Richard Evans Schultes—teacher, mentor and friend—resulted in a most extraordinary legacy that impacted an entire academic discipline as well as the tropical rainforest, where he spent so much of his time. His life and times have been brilliantly chronicled by Wade Davis in the biography *One River: Exploration and Discoveries in the Amazon Rain Forest* (1997). At this, the tenth anniversary of his passing in 2001, we celebrate, with this symposium, his life and academic contributions. Professor Schultes, as his students always called him with such great reverence, was a founder of The Society for Economic Botany in 1959 and edited our journal for 18 years, from 1962–1979. His multidisciplinary scientific research program began in 1936 with that well-known trip to Oklahoma and lasted far beyond his retirement from Harvard in 1985. Professor Schultes' mentorship of dozens of Ph.D. students during his career at Harvard, combined with his teaching, lecturing, and inspiration of tens of thousands of students throughout his long and distinguished career, did much to influence the trajectory of ethnobotany and economic botany. His academic philosophy and values were heavily influenced by his mentor, Oakes Ames. These values are deeply infused in the lives and professional activities of his numerous students, as can be seen from the presentations in this symposium.

A few weeks after returning to the United States from nearly a year of studies in the Costa Rican rainforest, I packed my bags once again and drove to Cambridge, Massachusetts. My purpose in traveling was to begin graduate studies at Harvard University, under the guidance of Professor Richard Evans Schultes. On my first visit to meet him, I climbed up the wrought iron staircase of the Botanical Museum where he had his laboratory, and marveled at the collection of glass flowers, carefully exhibited and curated under the watchful eye of my future mentor. This collection of exacting copies of plants was produced by Leopold Blaschka and his son, Rudolph, during five decades, and comprises over 830 species and 3,000 models. This priceless collection was commissioned in 1886 in order that professors could utilize

the highest quality specimens, year around, in botany classes at the University.

Finally, at the top of the stairs, I knocked softly, and with a great degree of timidity, on the Professor's massive steel door. He was seated behind a pile of herbarium specimens collected from the Colombian Amazon, outfitted in grey flannel slacks, red suspenders, starched white shirt and a white laboratory coat. I was to learn that this was his uniform in Cambridge, as much as his pith helmet, khaki pants, and khaki shirt were his uniform in the Amazon. He greeted me with a fatherly smile and began to listen to my stories of life in the tropics, as he would do over the next two and a half decades. We exchanged notes on our travels, his of nearly half a century, mine embryonic by comparison. It was clear from the first meeting that I was in the presence of a most unusual person, a great thinker, and

¹ A portion of this manuscript was published in the following obituary of Richard Evans Schultes: M.J. Balick. 2001. In gratitude Richard Evans Schultes 1915–2001. *Plant Talk* (July):34–35.

² Director and Philecology Curator of Economic Botany, Institute of Economic Botany, The New York Botanical Garden, 2900 Southern Blvd., Bronx, NY 10458. Email: mbalick@nybg.org.

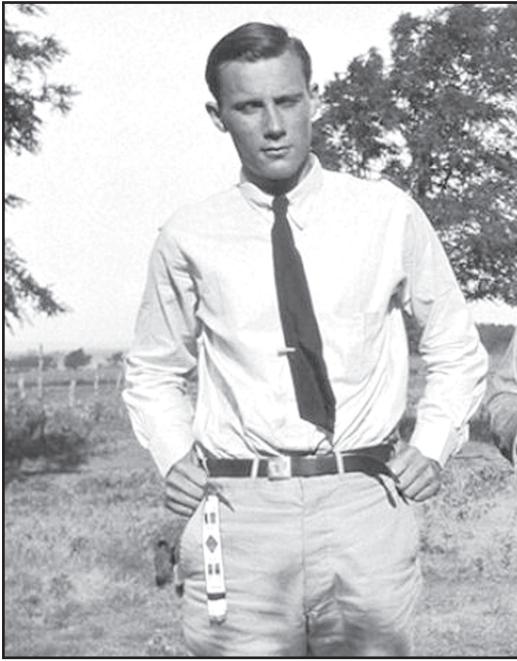


Figure 1. Young Richard Evans Schultes during his fieldwork investigating peyote in Oklahoma. Photo courtesy of R.E. Schultes.

an individual who viewed life as an opportunity to carry out the dreams of his early youth—to explore the most remote parts of the Amazon Valley, as did his hero Richard Spruce, the 19th century English botanist. The Professor told me that, as a six-year-old child bedridden by illness, he was given a copy of Spruce's *Notes of a Botanist on the Amazon and Andes*. Young Richard was enthralled by the tales of the explorer after whom he was to model so much of his life, as he made his way up the planet's most remote rivers, collecting plants and learning about their ethnobotanical uses along the way. Rarely does a person have the chance to fulfill such dreams through a career of exploration, collection, teaching and writing, as Richard Evans Schultes did, while at the same time inspiring a generation of botanical scientists to carry on his work around the world.

Richard Evans Schultes graduated from Harvard with an A.B. (cum laude) in 1937, having written an undergraduate thesis on Peyote (*Lophophora williamsii* (Lem.) J.M. Coult.) and its uses (Fig. 1). He undertook extensive fieldwork in Oaxaca, Mexico as a graduate student, producing a two-volume tome, *Economic Aspects of the Flora of Northeastern Oaxaca*. He went to the Amazon to study the indigenous use of curare (*Chondrodendron tomentosum* R. & P.) in 1941, supported by a National Research Council fellowship. At the outbreak of the war, he made his way from the Amazon, to Bogotá, Colombia, where he intended to enlist in the U.S. armed forces, but instead was pressed into the service of his country, collecting and studying rubber germplasm, a commodity vital to the war effort that was in desperately short supply. He remained continuously in his beloved Amazon Valley until 1953, when a Harvard administrator discovered that he had only taken out a one-year leave of absence, and it was time to return. He became Curator of the Orchid Herbarium of Oakes Ames in 1953, Curator of Economic Botany in 1958, Executive Director of the Harvard Botanical Museum in 1967, and Director of the Museum in 1970, a position he held until his retirement from Harvard in 1985. He received many honors from learned societies and governments around the world, too numerous to name in this brief piece. One of his greatest accomplishments, of which he was most proud, is his family: his wife Dorothy Crawford McNeil whom he married in 1959, and his children Richard Evans II, and the twins Neil Parker and Alexandra Ames. He would constantly speak about them to all of his students, passing along the lessons he learned about balancing family and work. He could read, write, or speak 10 languages, including two Amazonian languages, Witoto and Makuna (Fig. 2). He

Figure 2. Richard Evans Schultes and Yukuna and Tanimuka Dancers, Río Guacayá, Colombia, April 1952. Photo courtesy of R.E. Schultes.



authored numerous books and many hundreds of scientific papers, for which he was internationally acclaimed.

He would always speak warmly of his mentor, the legendary botanist Oakes Ames. Professor Ames, an economic botanist and specialist in cultivated plants and the taxonomy of the Orchid family, encouraged his student to pursue a career involving plant exploration. In a wonderfully revealing book, *Oakes Ames: Jottings of a Harvard Botanist*, edited by his daughter Pauline Ames Plimpton, there is an appendix of letters written to friends and colleagues, including the young student Richard Evans Schultes. In thinking about how his academic values and philosophy were devel-

oped, in preparation for this symposium, I read these letters and realized just how much Ames had influenced Schultes.

In an early letter to the Harvard undergraduate, Ames advised Schultes to soak up the classics and poetry, in order to help shape his writing (March 22, 1937):

My dear Mr. Schultes,

When I was a student, and that was many years ago, Charles Eliot Norton urged us read a bit of poetry every day. Indeed, one of the Boston papers got wind of this advice and printed on the first page each day a few lines from the best poets. I am sure there is much to be gained by reading a little

from the great classics, and if this is done just before you yourself are about to give expression to some thought, the results are worth the interruption....And don't let a month go by without drinking in the literary charm of Shakespeare, just a page or two, now and again. This simply means that in golf, tennis, billiards, in any other game, you imitate the strokes of the masters. How much more important to enrich your vocabulary and to learn how to express yourself fluently and well in the language God has given you by reading the best English.

With my best wishes,
Oakes Ames

While thinking about his doctoral dissertation, which was heavily based on his extensive field studies in Mexico, Schultes was counseled by Ames to emphasize the importance of his applied work, and the remarkable lessons of nature, as compared to the "basic" laboratory research being carried out by many of his peers (March 4, 1940):

Dear Richard,

I desire strongly that you get away from the failings of some of those "Biological Laboratory" lads whose opinions seem to worry you. In this regard, study the philosophy of jealousy. In my life-time I have read many Ph.D. theses and I once drew up some rules to cover the procedure under which some of these lads write. If you are interested here are a few of them: (1) Find some topic devoid of human interest and make it stupid. (2) Sift out every spark of human interest and write so badly regarding the residue that your ambiguity seems to imply erudition. (3) If you are capable of giving

birth to a single worth-while idea, conceal it. (4) Write a cryptic summary...

And as his career progressed, Ames continued to write Schultes and encourage him to continue his work with an attitude of appreciation for humanity (March 30, 1941):

Dear Richard,

There are the big biologists and the little biologists. Most of the big biologists I have known or read about have been inferior teachers. But they have been so much imbued with the importance of humanity that they remind me of the glowing sparks which rise above the dying embers of the fire at night and seem to be carrying toward heaven a worthwhile message. The scintillating sparks rising from a kicked log on the campfire mark the difference between the stolid "standpatter" and the inspiring leader...

A few weeks later, Ames wrote about the importance of ethnobotany in a world that was globalizing, many decades before the world became aware of that phenomenon. As Western civilization spread across the world, its influence seeping into the most remote reaches of the Amazon, indigenous cultures that Schultes loved so much were faced with striking change, both in the way they lived and coping with the destruction of the environment around them. Schultes' ultimate reaction to this crisis was to sound the alarm, again decades before anyone else had realized what was happening to the tropics and its peoples (April 19, 1941):

Dear Richard,

I have presented to you the term 'treasured traditions.' When we pause to think about the

influence of a dominating civilization it becomes clear that subjugated or submerged peoples forego many of the products and customs treasured through undated time and gradually adopt new ones. This process leads to the abandonment and gradual disappearance of many products once cherished. Unless the ethnobotanist records these while they are as yet waning, there comes a time when they are forgotten and take their place among the irrecoverable materials of human history. Hence, one of the prime duties of ethnobotany is to safeguard botanical knowledge that is on the way out, especially botanical knowledge that is integrated with human affairs...When Alexander Graham Bell tried to interest my father and his cousin F.L. Ames in the telephone, he was told that his invention had promise as a toy, but that as a practical economic contrivance it had no value whatsoever. The crucibles of progress are tended by men with vision. If you tend your crucible with an open mind, with faith in your venture, you may one day find yourself among those who have triumphed.

As Ames' passionate disciple, Schultes drank in his advice and teachings, executing his work with brilliance and precision. His command of the classics, of languages, of history, of philosophy and science provided Schultes with a perspective held by few in his day or at present. Following are a few of the many values held by the Professor, that guided the trajectory of his research and life, both in the field, classroom, and at home. There are of course many more, but I will leave the complete listing to others, perhaps as a group effort.

- The wilderness is your classroom and laboratory: As students we were advised to

spend as much time in the field as possible, much in the same way that Schultes did as a student and then throughout his entire career—initially in the role of explorer, and eventually as teacher, mentor, and advisor to those seeking to conserve the Amazon region and protect its people.

- Basic biological and ethnobotanical inventory are important activities, more so when combined with hypothesis-driven, applied research questions that address real world issues: Schultes was passionate about the importance of basic inventory—of biota as well as the uses developed by people living in tropical environments. He recognized the fragile nature of both the biosphere and the ethnosphere in the regions where he worked, and encouraged us to document as much of both as possible, while at the same time shaping our work in a way that allowed it to address matters of great human concern—new sources of food, energy, medicine, fiber, and the many other necessities of both Western and indigenous culture that could be derived from nature and promote its utility and conservation.
- Great respect for indigenous people and their knowledge of the environment and its complex interrelationships: His research on the chemistry of plants used as psychoactives and medicines, the ways in which Amazonian cultures detoxified their food crops, such as cyanide-rich cassava, and their overall understanding of how ecosystems work, convinced Schultes of the sophistication of their understanding of the plants around them, and their experimentalist nature.
- Many important questions in science are best answered through a multidisciplinary lens: As the result of his broad training,



Figure 3. Photo of Richard and Dorothy Schultes from a Christmas card sent in the 1990's. Photo courtesy of R.E. Schultes.

Schultes knew what most of his colleagues at the time failed to realize—that a multi-disciplinary approach to certain research questions, particularly those with an applied context, would yield much greater results than addressing the questions from a single perspective, or even a collection of single perspectives. Ames had taught Schultes as a young scientist to take off his disciplinary blinders.

- A personal commitment to lifelong learning: What fascinated me about the Professor was his humility in admitting what he did not understand or know, and that he was always ready to learn (or unlearn) something about nature.
- Working for his students, not the other way around: Schultes was exceptionally devoted to seeing his students progress in their careers, even though he had a *laissez-faire* philosophy when it came to day to day supervision. He would help his students find their way, and continue to do so, as long as he was at Harvard, and well into retire-

ment. His students received suggestions for sources of funding, nominations for membership in prestigious learned societies, support for grant proposals, and anything else he thought could be helpful in launching or sustaining their careers.

- Gentlemanliness: In Schultes' mind, everyone was to be treated with respect, honor, and fairness in all manners of conduct and manners, or as he called it, the characteristic of "gentlemanliness."
- Devotion to family, friends, and community: This was a great and inspiring value to all of Schultes' students. He took great pride in both his academic and biological family, constantly spoke of Dorothy and the children, and felt that participation in his community was an essential part of his responsibilities as a teacher and mentor (Fig. 3).

To his students Richard Evans Schultes offered one of the greatest gifts that a teacher can give—opportunity. He was not the kind

of teacher who would hold his students' hands, except to navigate some of the intricate political waters of the university. Consequently, his students were independent, took initiative, and could face successfully the many problems that fieldwork involved—from plane and boat mishaps or food shortages, to dealing with governmental visa and permit applications. These were essential survival skills for coping with life, I was later to discover. I was privileged to spend a portion of my academic life at the side of this great man, whose intelligence, courage, sense of humor, vision, and accomplishments were so inspiring. And of course, I received my series of letters from the Professor over several decades, offering guidance in my family and professional life, discussing topics of scientific concern, and reporting on his lat-

est travels and accomplishments. His tenure as Director of the Botanical Museum was a “Golden Age” of ethnobotany and economic botany, with dozens of graduate students immersed in field studies around the world. Every week another international luminary and friend of the Professor would drop by to see him, to lecture the students, and offer their wisdom to the group.

Richard Evans Schultes left his mark on many institutions and professional associations during his career. At The New York Botanical Garden, he encouraged the establishment of the Institute of Economic Botany, initially directed by his friend and colleague Sir Ghilleen T. Prance, and was an active member of its board of scientific advisors. He was a founder of the Society for Economic Botany and editor of its journal from



Figure 4. Painting of R.E. Schultes in the Nash Laboratory, with his blowgun and classroom display. Painting by Hannah Barrett; courtesy of Harvard University Herbaria.



Figure 5. The author with his professor in front of the Botanical Museum, Harvard University Graduation, June 1980. Photo courtesy of the author.

1962–1979, providing guidance to a generation of economic botanists and ethnobotanists struggling to get their data and ideas on paper and into wider circulation. He helped set up programs in economic botany at academic institutions and development projects around the world. And he was known by thousands of Harvard undergraduates for his teaching of Biology 104, the Economic Botany course that he noted was the “oldest course in the sciences at Harvard.” Among the useful skills these future scientists, doctors, lawyers, and businesspeople learned was how to aim an Amazonian blowgun and shoot a curare dart into a target on the other side of the lecture hall. He showed me how to use the blowgun in the classroom, and explained how and why it worked. This particular skill was to come in quite handy dur-

ing my fieldwork in the Colombian Amazon (Fig. 4).

Despite his reputation as one of the great explorers of our era, he always advised his students not to actively seek out adventures in the course of their scientific work. He once insisted to me that “if a scientist is going to the field in search of adventures he should not be there in the first place!” In my travels, which traced a small portion of his itinerary in the Colombian Amazon, I was to hear many stories about Schultes’ exploits, which he rarely discussed when in Cambridge, from his former guides. It is not often that the biography of a botanist is written during his lifetime. As an example of the respect his students accorded him, Wade Davis, who did his Ph.D. under Schultes, devoted several years of his life to researching and writing *One River: Ex-*

ploration and Discoveries in the Amazon Rain Forest, an extraordinarily detailed and well-written book on the life and times of the Professor and his most notable student, the late Timothy Plowman.

Richard Evans Schultes, scientist, teacher, mentor, father, and friend, left an extraordinary legacy to so many of us. I am grateful to him for believing in me, for imparting some of his wisdom, and for being so patient a mentor

(Fig. 5). To his family, I offer my gratitude for allowing him to share his life with us all.

LITERATURE CITED

- Davis, W. 1997. *One River: Explorations and Discoveries in the Amazon Rain Forest*. Simon & Schuster, New York.
- Ames, O. 1980. *Oakes Ames: Jottings of a Harvard Botanist*. Harvard University Faculty of Arts and Sciences, Cambridge.



Medicinal Plants and the Legacy of Richard E. Schultes was an all-day event held at the Botany 2011 meetings in St. Louis in honor of Dr. Richard E. Schultes. Professor Schultes was one of the great botanical explorers of the Amazon Basin, whose work redefined the discipline of Ethnobotany. Contributors recounted his work and the research it inspired.

Contributors include:

- Michael J. Balick, New York Botanical Garden
- Rainer W. Bussmann, WLBC, Missouri Botanical Garden
- Robert Bye, Universidad Nacional Autónoma de México
- Rodrigo Cámara-Leret, Universidad Autónoma de Madrid
- Andrés Gerique, Institute of Geography, University of Erlangen-Nuremberg
- Aline Gregorio, California State University, Fullerton
- Steven R. King, Napo Pharmaceuticals
- Manuel J. Macía, Universidad Autónoma de Madrid
- Narel Y. Paniagua Zambrana, Universidad Autónoma de Madrid
- Leaa Short, California State University, Fullerton
- Neil P. Schultes, The Connecticut Agricultural Experiment Station
- Djaja D. Soejarto, University of Illinois at Chicago
- Robert Voeks, California State University, Fullerton
- James S. Zarucchi, Missouri Botanical Garden

