

•• P R O F I L E S ••

JUNGLE BOTANIST

[He] betook himself to one of the wildest and least known of jungle areas of the world, to spend fourteen years of his life in hard physical work, constant exposure to the tropical elements and diseases, insufficient diet, and complete lack of even rudimentary comforts. A scholar with a thorough classical training and of outstanding cultural and scientific attainments, he divorced himself from all centres of culture and lived for long periods amongst Indians or unlettered half-breeds. A superb correspondent, he plunged himself into regions where, for months on end, he received not one letter or newspaper. . . . A mild-mannered and dignified person, he feared none of the dangers that his expeditions presented. . . . And, perhaps most astonishing of all: a naturalist who looked with abhorrence on the philosophy that nothing not immediately beneficial to man was worthy of study, he . . . filled his note-books with observations and studies on all manner of native economic plants, including gums and resins, fibres, foods, drugs, narcotics and stimulants, oils, dyes, and timbers.

PEOPLE who follow the twining trails of botany could take that to be a testimonial to Richard Evans Schultes, a Harvard professor emeritus and this country's ranking ethnobotanist. But Schultes was the writer, and his subject was a nineteenth-century English explorer of the Amazon, Richard Spruce, in whose footsteps Schultes has long trodden. Over his own nearly fourteen Amazon years, most of them spent in narcotics-ridden Colombia, Schultes—who has probably sampled a greater assortment of hallucinogens than any of his students ever fantasized about—had his share of Spruce-like hardships. Once, he had to help paddle a canoe for forty days, his arms and legs growing increasingly numb, in order to reach a doctor better equipped than any shaman to treat him for beriberi.

In urban life, Schultes, for all his firsthand acquaintance with drugs, has remained relatively detached from his North American neighbors' concerns about their destructive use. His own concerns have been largely pedagogical and medicinal. In more than a dozen books and in hundreds of articles he has reminded readers that, of the world's several hundred thousand species of plants, about eight thousand have, at one time or another, been accorded therapeutic value. The Chinese alone, back in the sixteenth cen-



tury, listed a thousand species in their materia medica; present-day traditional doctors in China still call upon many of them. Now that the bark of the Pacific yew tree has been proved adversarial to ovarian cancer, scientists like Schultes hope, not unreasonably, that somewhere, out in some forest, there stand, waiting to be discovered and embraced, cures for Alzheimer's and AIDS. Why not? Hasn't Sean Connery, after all, already discovered on-screen an Amazonian cure for cancer in "Medicine Man"?

Today, the health problems of three-quarters of the human population are attended to, if at all, exclusively with medicines derived from plants. It is no wonder that Schultes sometimes seems to look upon the jungle, in which he once remained without a break for an entire year, as the equivalent of a neighborhood pharmacy. In his admittedly biased view, even such items of conventionally ill repute as marijuana, peyote, and cocaine belong on the pharmacy's shelves. Marijuana has proved efficacious against the nausea that can be a side effect of chemotherapy, and until March, when the Public Health Service high-handedly changed the rules, the number of patients legally smoking pot in order to treat symptoms of glaucoma and AIDS was growing. Mescaline, a derivative of peyote, has been employed by psychiatrists—mainly European

ones—to hasten the flow of revealing information from their patients. As for cocaine, Schultes wrote as recently as 1990, in a magazine article, that in Richard Spruce's day it had been "recommended in Western medicine as an excellent local anesthetic," and he added, "It is still valuable, especially in ophthalmological and ear, nose, and throat surgery." He did feel constrained to explain, for the benefit of those unfamiliar with the nuances of narcotics, that "it is the use of the purified alkaloid—not the aboriginal employment of the leaves or powder as a masticatory among South

American Indians—that may lead to dangerous addiction." And in 1972 he had asked, with a wistful eye to the future, "Could we ever have dared predict that the intensely poisonous false hellebore, employed by certain North American Indians to choose a new chieftain through a dangerous and sometimes fatal intoxication of young braves, would yield a valuable hypertensive agent?"

NOW seventy-seven and retired from on-the-spot jungle research, Schultes lives in suburban Massachusetts. He wears dark-wool three-piece suits and steel-rimmed spectacles, which, combined with a stately bearing and a fringe of white hair, give him the look of a sedentary Ivy League mentor. In the Amazon, however, when the Indians he consorted with went about near-naked, so did he. Until Schultes came along, many of them had never seen a white person, let alone one who, at six feet one, towered over all but a very few of them. The name that certain tribesmen gave him was their word for "father," and until he could persuade them of his mortality some took him for a heavenly father. Others, considering his singular appearance and alien paraphernalia (pencils, notebooks, Band-Aids), conferred on him their equivalent of the title "white witch doctor."

Schultes may be the only living person to have more than two million

acres of the Earth named after him—Sector Schultes, an Amazonian tract thus formally designated in 1986 by the Colombian government. Though by far the largest, this tract is only one of dozens of entities that bear his name. He is proud that among the plants considered pharmacologically noteworthy by shamans who prescribe and administer them in Amazonia—a region that Schultes, despite all he has endured there, calls “green heaven”—are, to mention just a few, *Pouroma schultesii* (the ashes from its burned bark are used by several tribes along the Rio Piraparana to treat ulcers), *Piper schultesii* (the Karijonas find a hot tea brewed from its stems and leaves effective against tubercular coughs), *Marasmius schultesii* (a powder from this mushroom, to be applied only in the evening and to be washed off the next morning, is treasured by Taiwanos suffering from eardrum fungus), *Virola schultesii* (the Taiwanos find the ashes from the burned bark of this tree helpful against cuts and other wounds), *Justicia schultesii* (the roots of which form the basis of a Makuna remedy for skin afflictions of the groin), and *Hiraea schultesii* (a wash from its leaves is advocated by the resourceful Makunas—though its North American name-sharer has misgivings about side effects—for the relief of severe conjunctivitis).

Beyond mere species, Schultes has also left his nomenclatural mark on genera. His 1990 book “The Healing Forest: Medicinal and Toxic Plants of the Northwest Amazonia”—on which the phytochemist Robert Raffauf collaborated, and which has a foreword by Prince Philip, in his capacity as president of the World Wide Fund for Nature—deals with fifteen hundred and sixteen species belonging to five hundred and ninety-six genera in a hundred and forty-five families. The genera named after Schultes are *Schultesiophyton*, used as raw material for panama hats; *Schultesianthis*, a member of the family to which the potato and the deadly nightshade belong; and a genus that its discoverer had to dub *Resia* (from the honoree’s initials) instead of *Schultesia*, because the latter had been preëempted by a German botanist in the eighteenth-thirties. The name *Schultesia* was entomologically available, however, and was given, in 1967, to a cockroach.

BUBBLES

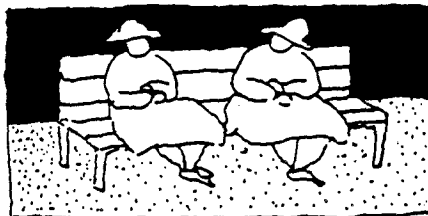
We are—not for ever but the moment—blowing bubbles in the kitchen. The trick is to catch these floating tears of light on the tongue: my daughter’s screeches of joy flying out the open door as each one pops and leaves the tiniest mite of light and soap, brief sharp aftertaste in the mouth. I’m remembering as we play this game of beauty and bitter taste how my mother in the home of slow bodies would sing without smiling—every second Wednesday, when the man with the accordion came—the same song: eyes empty, a little glazed, microphone cumbersome between hand and mouth, her worried voice almost inaudible under the music. But bravely she’d whisper-sing, shoulders swaying, until she got to *They’d fly so high*, where always she’d forget the words and hum the air, poor eyes searching while the others murmured a chorus, stared off, or just nodded—holding absently any hand that had been offered. She’d stop, then sit to a sprinkle of applause, the accordion crescendo, burst bubbles ghosting the air as I squeezed her arm: those bright nothings marking as they wink out our little time.

—EAMON GRENNAN

That year, Schultes accompanied an Amazonian expedition sponsored by the National Science Foundation. The leader was the late Harvard entomologist Carroll Williams, who had invited Schultes because of his knowledge of Brazil and of jungles. On the expedition, Dr. Louis M. Roth, a cockroach expert who is now with Harvard’s Museum of Comparative Zoology but was then affiliated with a United States Army research laboratory at Natick, Massachusetts, accompanied Schultes into the rain forest in a dugout canoe to search for indigenous members of the order *Blattaria*. At first, they sighted no bugs, only birds—creatures that Schultes has never evinced interest in. (He has said that he considers birds just about as boring as bird-watchers.) But then they spotted provocative nests hanging from the trees around them.

As Schultes recalls the episode, he instructed a young Indian assistant to climb up and inspect the contents of the nests but not to touch them if they contained baby birds; and he remarked, “Wouldn’t your damned cockroaches love all the bird shit in those nests!” There were no baby birds, but there were three-inch-long roaches so plump and so rare as to quicken any entomological pulse. Their ilk has been known as *Schultesia* ever since. For quite a while, Schultes carried a snapshot of a cockroach in his wallet, as a lesser man might carry one of a grandchild. Few visitors to his home leave without being shown a portrait of a mounted specimen, or, failing that, being told of the time that, at a Harvard reception for a Nobel Prize winner, Schultes declared, “There must be about seventeen scientists in this room with a Nobel, but there’s only one with a cockroach named after him.”

Schultes seldom makes jokes at Harvard’s expense. He is what’s known as an ibid—someone who has earned all his academic degrees at the same institution. In his case, the degrees, all from Harvard, are A.B. (in 1937), A.M. (in 1938), and Ph.D. (in 1941).



d. ehrenberg



CROSSED PATHS

Giacometti Meets Olive Oyl

Harvard has figured so prominently in his adult life that his wife, Dorothy, a retired opera singer, often says that she has had to be content with being his third love, after the university and botany. When they got married, in 1959, he picked Cuba for their honeymoon, because Harvard had a botanical garden there. Whenever he is booked to lecture at Yale, he grouches—even though he has a son on its faculty—about “slumming,” and dons what he calls his mourning necktie, the blackest on his rack. He is co-editor of a series of books, *Psychoactive Plants of the World*, published by the Yale University Press. He sort of hopes nobody will notice.

RICHARD SPRUCE, who died in 1893, did not know he was an ethnobotanist. The term came into fashion a decade or so after his death, to describe a scientist bridging the gap between botany and anthropology, by linking human beings of a specific region and their dependence—medicinal and hallucinogenic, in large part—

on the indigenous plant life. “Ethnobotanist” is credited to John W. Harshberger, a botanist at the University of Pennsylvania, who in coining the word stressed the importance of getting acquainted with primitive races and “the plants which they have found available in their economic life, in order that perchance the valuable properties they have utilized in their wild life may fill some vacant niche in our own.” Prince Philip once called Schultes the founding father of ethnobotany, but when Schultes—whose own most recent definition of the word is “the complete registration of the uses of and concepts about plant life in primitive societies . . . comprising aspects of botany, anthropology, archeology, plant chemistry, pharmacology, history, geography, and sundry other tangential fields of the sciences and arts”—tries to enlighten laymen about precisely what it is that he does he says, “I’m just a jungle botanist.”

The *Times Literary Supplement*, in a review of one of Schultes’s hefty works (he has described a nearly five-

hundred-page tome of his as “these notes”), deplored the unscholarly omission of an index but nonetheless called him “a true ethnobotanist, the incarnation and almost the inventor of this discipline.” Schultes rather liked that “incarnation.” Surely, he thought, it was an allusion to his relationship to Richard Spruce, who, he has written, “typified that all-around scientist and man of culture that unfortunately, in this modern period of overspecialization and compartmentalization, is so sorely missed and so urgently needed.” Didn’t he and Spruce, after all—middle names aside—have the same initials? The same first name? Once, the American was hesitantly asked by a friend whether he thought he had in any way patterned his career, subconsciously or unconsciously, on that of the Englishman. “Neither,” Schultes said. “Consciously.” The title he gave to one of his many glowing tributes to his forerunner—an article in the magazine *Northern Gardener*—was “Richard Spruce Still Lives.”

Spruce was born in 1817, not quite

a century before Schultes, in Ganthorpe, Yorkshire, on the property of Lord Howard, whose castle would, more than a century and a half later, be used as a sizable prop for the TV series "Brideshead Revisited." The young Yorkshireman became a teacher, but in 1844, at twenty-seven, he got permanently sidetracked into mosses. Before he was through, he had pursued these so ardently in the Pyrenees that he came up with seventeen previously unrecorded species. Later, feeling depressed in the South American bush, he wrote, "I found reason to thank heaven which had enabled me to forget the moment of my troubles in the contemplation of a simple moss."

Spruce first set his sights on Latin America when he was in his early thirties. He landed at Belém, just south of the mouth of the Amazon, in July, 1849, and stayed in South America, with no transatlantic furlough, until 1864. One round trip inland from the Brazilian river port of Manaus up and

down the Río Negro took three years. Schultes has written:

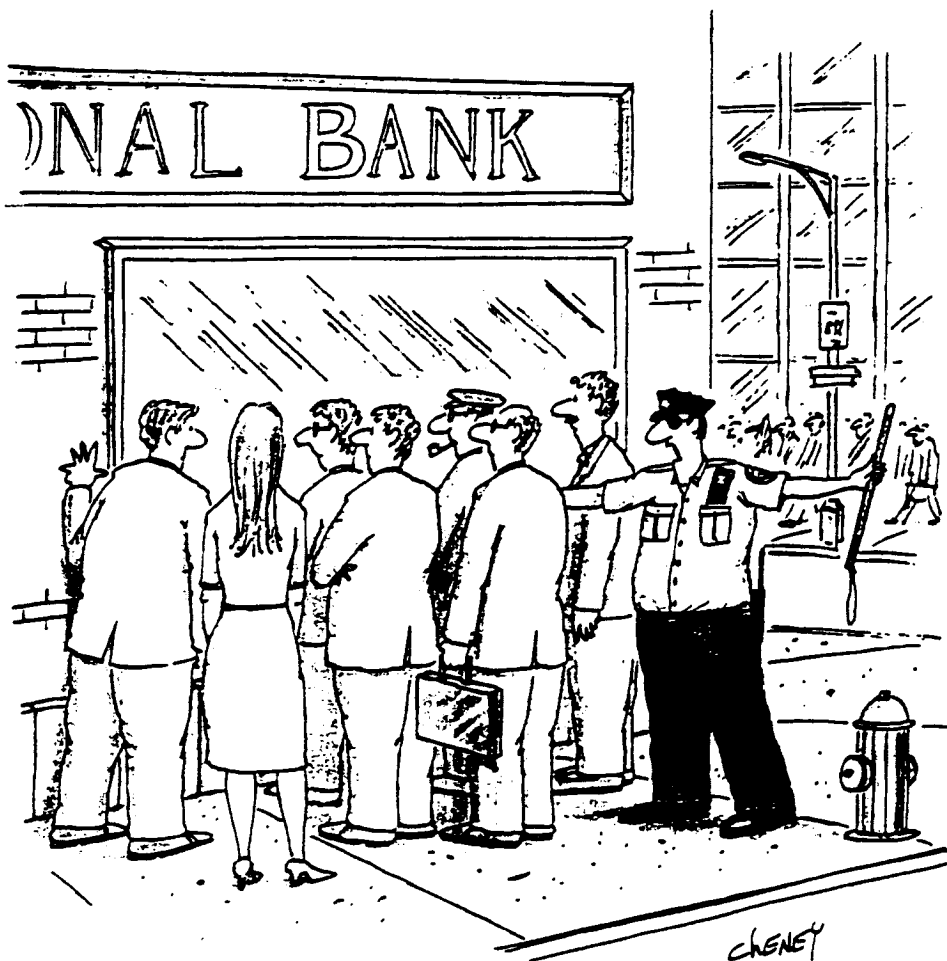
There can be no doubt but that this odyssey represents the pinnacle of botanical expeditions in South America. Not only from the point of view of the amount and quality of plant material gathered, the number of new species and genera discovered, phytogeographical observations and investigations of an anthropological, ethnobotanical, linguistic, geographic, and meteorological nature, but also from the sheer physical undertaking and the demonstrations—too numerous to recount—of a moral stamina which beat down and overcame sickness, hunger, weariness, and loneliness—from all these points of view, Spruce's Río Negro trip cannot be matched in the annals of natural history in South America.

No matter how far Spruce travelled, his mail eventually caught up with him. One accumulation of letters reached him in a Peruvian mountain village called Tarapoto. "In it was a letter from Her Majesty's Colonial Secretary," Schultes says, his hackles rising. "Queen Victoria had people around whose knowledge of geography was as limited as that of our State Department today. The letter instructed Spruce to go to a part of Ecuador nine thousand

feet up, to procure the best strains of quinine, so they could get rich growing it commercially on plantations in Ceylon and Malaya. Spruce obediently set forth. It took him three months to get there. He spent four years in Ecuador, some of that time in awful health. But the seeds he reaped—from which, incidentally, he earned not tuppence—were to have a profound effect on the health of much of the rest of the globe."

Spruce, like Schultes in his turn, became deeply interested in narcotics, and in the Indians' reliance on them for both hallucinogenic and medicinal purposes. (The two men did differ in one important respect: Schultes regards the Indians of his acquaintance as real friends; Spruce didn't much take to those he knew.) In 1851, Spruce was the first outsider to come upon and carefully examine ayahuasca, a drink made from the plant *Banisteriopsis*, and also called, variously, yajé, pinde, natém, and—one of its more popular cognomens—caapi. Many Indians characterize the plant as "the vine of the soul," and believe that to drink its juice is, as one of them told Spruce, "to return to the maternal womb, to the source and origin of all things." Paintings made by Tukano Indians under its influence have frequently incorporated an anaconda or two, reflecting the local belief that their progenitors descended from the Milky Way in a canoe hauled by one of the big snakes, and brought with them three life-sustaining substances: caapi; tapioca, for food; and coca, to alleviate hunger when food was scarce. Schultes, like Spruce before him, was often grateful for coca over lean and hungry stretches.

Schultes was no less beguiled by caapi. It is the hero of his most recent book, "The Vine of the Soul," subtitled "Medicine Men, Their Plants and Rituals in the Colombian Amazon." The book is another collaboration with Robert Raffauf, who is a retired professor of pharmacognosy and medicinal chemistry at Northeastern University. The two men have known each other for almost forty years, and have made several Amazonian treks together. Some of their contemporaries consider it only justice that, after all their arduous researches in the wild, Schultes and Raffauf were invited to polish their manuscripts on the meticulously cultivated grounds of the Rockefeller Foundation's sybaritic Villa Serbelloni, at Bellagio, Italy.



"O.K., folks, let's move along. I'm sure you've all seen someone qualify for a loan before."

In "Richard Spruce Still Lives" Schultes said that "Spruce's interest in caapi and his willingness to experiment with the then unknown narcotic sets forth clearly that deep-rooted curiosity in natural things which makes him one of the peers among naturalist-explorers," and he passed along Spruce's account of one caapi festival:

I had scarcely dispatched one cup of the nauseous beverage, which is but half the dose, when the ruler of the feast—desirous, apparently, that I should taste all his delicacies at once—came up with a woman bearing a large calabash of caxiri (mandioca beer), of which I must needs take a copious draught, and as I knew the mode of its preparation, it was gulped down with secret loathing. Scarcely had I accomplished this feat when a large cigar, 2 feet long and as thick as the wrist, was put lighted into my hand, and etiquette demanded that I should take a few whiffs of it—I, who had never in my life smoked a cigar or a pipe of tobacco. Above all this, I must drink a large cup of palm-wine, and it will readily be understood that the effect of such a complex dose was a strong inclination to vomit, which was only overcome by lying down in a hammock and drinking a cup of coffee which the friend who accompanied me had taken the precaution to prepare beforehand.

Schultes went on, "With Spruce's long and detailed account of this intoxicant and its use began a continuous series of researches . . . of a plant which one day may be of promise in medicine, due to its weird properties." Schultes himself was subsequently in the forefront of that research, and when he disclosed his experiences he usually made it clear that they weren't entirely enjoyable, either, and that he, too, shied away from a full-strength dose of anything—a precaution he cited, a little sadly, as a plausible reason that he, unlike his Indian friends, had never encountered a jaguar while under a spell.

Schultes's sequential, small-dose research was no more fun than Spruce's:

My own experiences from participation in many Amazonian *Banisteriopsis* rituals might be summarized by saying that the intoxication began with a feeling of giddiness and



"These are your friends the Erskines, sir. Madam kisses both of them. You kiss her and you shake his hand. Then you wink and say, 'Hey, how about those Yankees?'"

nervousness, soon followed by nausea, occasional vomiting and profuse perspiration. Occasionally, the vision was disturbed by flashes of light and, upon closing the eyes, a bluish haze sometimes appeared. A period of abnormal lassitude then set in during which colours increased in intensity. Sooner or later a deep sleep interrupted by dream-like sequences began. The only uncomfortable after-effect noted was intestinal upset and diarrhoea on the following day. At no time was movement of the limbs adversely affected. In fact, amongst many Amazonian Indians, dancing forms part of the caapi-ritual.

He did not reveal whether he himself ever felt up to dancing on such occasions.

In 1864, Spruce finally returned to England, sick and broke. Toward the end of his life, he could barely move about, and he had to make do with a hundred-pound-a-year pension, most of his meagre savings having vanished in the collapse of an Ecuadoran bank. While he was still abroad, he had written to a friend back home:

I have been too constant to botany; several times in the course of my travels I might have taken to some occupation far more lucrative; and I have met many men who, beginning without a cent, have made more money in two or three years than I in the thirteen, and

that without being exposed to thunderstorms and pelting rain, sitting in a canoe up to the knees in water, eating of bad and scanty food once a day, getting no sleep at night from the attacks of venomous insects, to say nothing of the certainty of having every now and then to look death in the face, as I have done. Excuse these personal details, which I have not entered into with any hope or desire of exciting sympathy, but simply to explain that, although still in the midst of objects interesting to the enquirer into the productions and processes of nature, I can pay little heed to them.

That was too much for Schultes. "Too constant to botany!" he spluttered in "Richard Spruce Still Lives." "Spruce himself never really meant to say this. He would have chosen the same course were a new life opened to him—because he was fired by a God-given urge to live with nature and to try to understand the mysteries of earth's green cover. How much better off are all we who have followed him that he was so constant to botany. Of no man can Juvenal's words be more truly spoken: *Scire volunt omnes, mercedem solvere nemo.*" ("Everyone wants to know, no one to pay the price.")

Spruce, in his day, was credited with collecting some ten thousand speci-

mens of plants. Over a like period, Schultes ran up more than twice as many—in at least one instance at the same place. “I may have touched some of the very trees he collected,” Schultes said not long ago, in tones verging on the worshipful. “There was this one riverbank Spruce mentioned, where he got out of a canoe, and there was this rock that resembled a sitting frog, and a hundred and fifty paces away to the north-northwest, in white sand, there was a caatinga—a forest of thorny trees—that Spruce wrote up. I like to think that I collected from some of the same trees that he did.”

SCHULTES, who was born on January 12, 1915, first heard of Richard Spruce when he was six or seven, and was living outside Boston, in Roxbury. At that time, he was confined to bed for six months with a troublesome stomach—hardly a promising start for a jungle explorer. His parents read to him a lot during this siege, and one of their offerings which especially impressed him included excerpts from Spruce’s “Notes of a Botanist on the Amazon and Andes.”

Schultes, who likes to describe himself as, depending on the circumstances and his mood, a fourth- or fifth- or even sixth-generation Bostonian, is indisputably third-generation American, if not Bostonian. His paternal grandparents moved to the United States from Prussia, late in the nineteenth century. Otto Richard Schultes, Richard’s father, fell somewhat short of being a proper Bostonian—he was born in Hoboken. He made and installed the plumbing for brewery vats (Roxbury had five breweries), and when in 1901 he went to South Africa it was to spend a year supervising the vats at a new Natal brewery. This experience may have been the high point of an otherwise fairly ordinary life: natty in white suit and pith helmet, the young man toolled around Durban in a rickshaw pulled by a Zulu with a headdress sporting two horns. During Prohibition, Otto settled in East Boston and went into the plumbing-and-heating business. He was hardy. Taken to a hospital at eighty-eight with a complicated case of cancer, he was given such good care (“The doctor was a Harvard Medical School grad, of course,” his son says) that he went home and enjoyed another five years. He died, at ninety-three, after he insisted on going

out for the morning paper during a blizzard, got stuck in a snowbank, and succumbed to pneumonia.

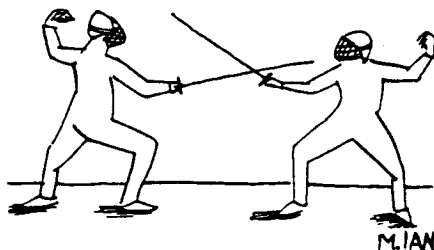
Richard’s mother, née Maude Bagley, was also second generation, and came from no less sturdy but far less lucky stock. Her father, descended from English sheep farmers, supported his six children adequately as a master mechanic, but while he was walking along a railroad trestle from their East Boston home to his Chelsea workplace one winter day he lost his balance, fell into the bay beneath him, and drowned. Her mother and her two older sisters had to go to work to support the family. The future Mrs. Schultes attended secretarial college and then became an office girl in a firm that made navigational equipment for boats. Two of her brothers, who were younger, in time made respectable headway in Massachusetts political circles. One acquired a farm at Townsend, in the northeastern part of the state. When the Schultes household came to visit, the uncle would lend Richard a floral guide, and the boy—even then something of a loner with a botanical flair—would go out and collect leaves and press them between its pages. Friends of Schultes’s with acute hindsight have wondered whether even back then he might have been exhibiting signs of possessing what scholars call “the taxonomic eye”: the knack—some think it can be inherited—of being able to detect at a glance something new and different, some morphological variation, in a plant. “Somebody like Dick Schultes can go into a jungle and brush by zillions of things that he knows he knows, and then spot something that holds his eye,” a botanical colleague said recently. “An exciting moment like that is, for him, a kind of epiphany.”

Richard went through the East Boston public-school system. His parents would have preferred the vaunted Boston Latin School, but their doctor thought the boy’s protracted illness made long trips by public transport undesirable. He got into Harvard anyway, and won a scholarship for the

four-hundred-dollar tuition. Even so, it would have been difficult for his family to afford the cost of a dormitory room his freshman year, and, with the doctor’s grudging concurrence, he commuted. He earned pocket money as a file clerk, for forty-five cents an hour, at Harvard’s Botanical Museum, a dowdy red brick edifice on Oxford Street which is best known as the repository of the university’s celebrated glass flowers. More than a quarter of a century later, Schultes was appointed the museum’s director, and became the flowers’ chief custodian.

Richard cut a modest swath as an undergraduate. His principal extracurricular affiliations were the Botanical Club and the Unity Club (a Unitarian organization). He did display a talent for languages. He took four years of German and one of Swedish. (In high school, he had taken French and Greek, and after Harvard he added Spanish, Portuguese, Makuna, and Witoto to his repertory.) And, all along—luckily—there has been Latin. Botany’s rules are unbending. By international agreement, its elders, the last scientists to hold out, insist that anything new discovered in their bailiwick be described, the first time around, in Latin. (About ten years ago, Schultes took a six-page paper about a discovery of his to the botanical museum’s printing office, and when the compositor saw that it was in Latin, and grumbled, the professor said, “You’re a Roman Catholic. You should know Latin.” The compositor replied, “The Church threw it out the window, and you damn-fool botanists had to go and keep it.”) “I’m terrible on names unless they’re the Latin names of plants,” Schultes says as a senior citizen. One of the qualities he admired about the ever-hovering ghost of Richard Spruce was that a catalogue of mosses Spruce had assembled was “written in an impeccable technical Latin.” Schultes professes to hate math. “I can’t do anything abstract, and math is abstract,” he says. He skipped it in favor of biology, as tangible a subject as he could imagine. A lecture course he took, Biology 104, turned out to be the most meaningful of his college career and, come to that, of the rest of his academic life.

Biology 104 dated back to 1874, which, as it happened, was the birth date of one of only four men to teach it over its hundred-and-eleven-year history—Oakes Ames. Professor Ames



M. IAN

had reportedly shown his mettle as a boy by memorizing the name of a new plant every day. When Schultes enrolled in the course, in 1935, Ames not only was a well-known economic botanist but held several university administrative positions, including that of supervisor of the Botanical Museum. He also had a worldwide reputation as an orchidologist. His enthusiasm in that field of inquiry was catching. In 1966, more than thirty years after attending Ames's class, Schultes, by then an Honorary Life Member of the American Orchid Society, was accorded the distinction of publishing an article about orchids for the *Encyclopædia*

Britannica. Schultes, to whom Ames, an authentic multigenerational Bostonian, became a kind of father figure, in time selected the elder orchidologist's surname as a middle name for one of his children, and a tree with intoxicating leaves which he had seen in a South American witch doctor's garden he named *Methysticodendron amesianum*.

As an undergraduate, Schultes read and was fascinated by a treatise on peyote, the stubby, spineless cactus that some North American Indians—principally those adhering to the Native American Church—referred to as “the divine intoxicant.” (They often bowed as they walked past one.) That seemed a promising topic for a thesis, and Schultes sought and got his professor's blessing. In fact, Ames went well beyond approval. Schultes had never been west of the Hudson, and the nearest known place in which to study peyote was Oklahoma. Ames said he might be able to wangle some funds to underwrite a Schultes trip out there, and he did; Schultes later learned that they came out of Ames's pocket. Schultes found himself a suitable travelling companion—a graduate student in anthropology at Yale (Schultes was more broad-minded then) named Weston La Barre, who later became a professor at Duke. La Barre found the excursion rewarding: his Ph.D. dissertation, “The Peyote Cult,” has

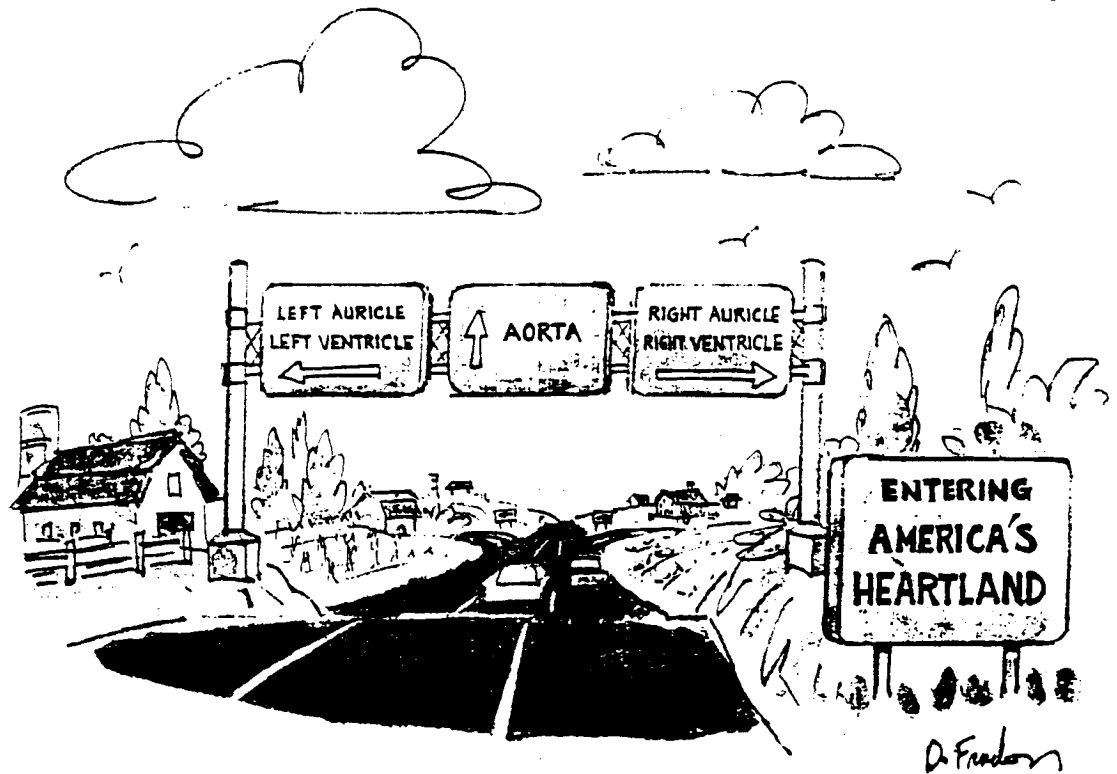
by his last count gone through thirteen commercial printings, and not only to slake the literary thirst of curious hippies. La Barre recently said, “I am told that when a new chapter of the Native American Church is planned in a tribe, they assiduously consult ‘The Peyote Cult’ in order to do it correctly. What if the young student had made a mistake?” Schultes's thesis—“Peyote (*Lophophora williamsii*) and Its Uses”—had a more limited readership: chiefly, Professor Ames.

During a month in Anadarko, Oklahoma, the two young men kept careful track of what they saw and heard and smelled and tasted. Even then, Schultes took pains to note, he consumed smaller portions of peyote than his Indian companions—though this was hardly of consequence, he also wanted it known, because peyote was “a completely innocuous narcotic, not habit-forming.” Neither Schultes nor La Barre ingested enough of the drug to converse with ancestors, as the Indians assured them *they* did. Schultes's reminiscences, compared with some of his later ones, were far from stomach-turning: “Peyote intoxication . . . is characterized especially by indescribably brilliant coloured visions in kaleidoscopic movement. These visual hallucinations are often accompanied by auditory, taste, olfactory and tactile hallucinations. Sensations of weightlessness, macroscopia,

depersonalization, doubling of the ego, alteration of loss of time perception and other rather unearthly effects are normally experienced.”

Already interested in the medicinal potential of plants, Schultes observed the application of peyote or its derivatives, seemingly with good results, to burned skin and to aching teeth. (In “The Peyote Cult,” however, La Barre is somewhat skeptical of peyote's medical efficacy, and points out that some of its reported curative effects could result from its hallucinogenic properties.) Back in Cambridge, early in 1937—his senior year—Schultes continued his research; in a Botanical Museum leaflet he wrote that although those who considered peyote an aphrodisiac were mistaken, “there are few diseases known to the Indians for which peyote is not believed to be a cure,” and he specified, “Among the many diseases listed by my Indian informants were tuberculosis, pneumonia, influenza, intestinal ills, scarlet fever, diabetes, rheumatic pains, colds, and especially grippe; some even included venereal diseases.”

The subject of Schultes's Ph.D. thesis was “The Economic Aspects of the Flora of Northeastern Oaxaca,” a province of southern Mexico, which he visited from time to time—now on his anthropological own—between 1938 and 1940. (Meanwhile, he had become a



teaching assistant in Biology 104.) His interest in Oaxacan plants stemmed from the writings of some sixteenth-century Spanish explorers: they reported what they had observed about teonanacatl, a hallucinogenic mushroom that Indians far and wide viewed as sacred and, specifically, as "the flesh of the gods." The reports also made Schultes eager to investigate a regional vine of the morning-glory family called ololiuqui. Its seeds were psychoactive, and had a numbing effect on human beings who chewed and swallowed them. Ololiuqui, like peyote, also appeared to be medically useful. (Two of its components are now used in modern drugs.) Once Schultes's report on ololiuqui was available in nonacademic circles, he assumed, pharmaceutical companies would surely follow up on it. But, aside from Oakes Ames and a few other scholars, nobody seemed to care. That was only one of sundry disappointments—a major one being that he hadn't had a chance actually to taste the flesh of the gods in Oaxaca. He later explained to the readers of a United Nations *Bulletin on Narcotics* that "so few mushrooms were gathered, because of the unusually dry season, that it was not possible for me to ingest them experimentally: all were needed"—here science had taken precedence over self—"as voucher herbarium specimens."

His doctoral thesis had an unexpected sequel: in 1953, twelve years after its acceptance, it found an interested off-campus reader in a fifty-four-year-old Morgan Guaranty Trust vice-president whose avocation was mushrooms. The mycologist, Robert Gordon Wasson, headed for Oaxaca. He was luckier than Schultes had been. Hallucinogenic mushrooms were abundant enough for Wasson to nibble on some fresh ones and send some to Switzerland to be chemically analyzed by Albert Hofmann, the phyto-

chemist who in 1938 had synthesized LSD—a man whom Schultes (later his friend and collaborator) had not yet met. Dr. Hofmann, always ready to play the role of guinea pig, ingested a bit himself, under controlled conditions. "Whether my eyes were closed or open, I saw only Mexican motifs and colours," he recounted in a scientific paper. "When the doctor supervising the experiment bent over me to check my blood pressure, he was transformed into an Aztec priest, and I would not have been astonished if he had drawn an obsidian knife."

IN the summer of 1941, right after getting his Ph.D., Schultes returned briefly to Mexico. A group of Harvard professors had been asked by the Rockefeller Foundation to go to Mexico to determine whether it should get heavily involved in agriculture there, and although his Spanish was not fluent, Schultes was dispatched to act as their translator. (Their findings were favorable, and the foundation went ahead.) Schultes stayed in Mexico long enough to improve his Spanish and his horseback riding—or, more precisely,

mule-back riding—and then, with Ames as intermediary, he accepted a National Research Council grant to proceed to Amazon country and look into curare, a substance whose numbing properties surgeons of the Northern Hemisphere had been increasingly interested in since the isolation, in 1897, of the alkaloid d-tubocurarine, a muscle relaxant that is still in pre-operative use today.

Schultes's introduction to Colombia was not heartening. An airplane taking him from Mexico City to Bogotá had engine trouble and made an emergency landing at the small city of Turbo. It was an unattractive site. Half a century later, what Schultes remembers best about it is that it harbored a dismayingly large number of sick-looking dogs. "I thought, God, what a horrible country!" he says.

Bogotá was different. He arrived on a Sunday, when the Institute of Natural Sciences, which had been alerted to his visit, was closed. It was a warm, cloudless day. The only dogs in sight seemed to be pampered house pets. First-day impressions can last a long time, and Schultes likes to recall that,

after checking into a hotel, he wandered around the capital, taking in a band concert and a parade of military-academy students. Then he spotted some open-sided streetcars. He hadn't seen any since he'd last been in Boston, and, nostalgically, he hopped aboard one. He had no idea where it was going.

On the outskirts of town, at the foot of a hill lush with foliage, some nuns escorting a flock of children got off—perhaps, he mused, for an instructive nature walk. He got off, too, and as they began to climb he followed them, taxonomic eye to the ground. Here was a bunch of epiphytes—mostly ferns. But what was that over there? It was a clump of tiny orchids, barely an inch



"But you are running an empire. The Empire of Phil."

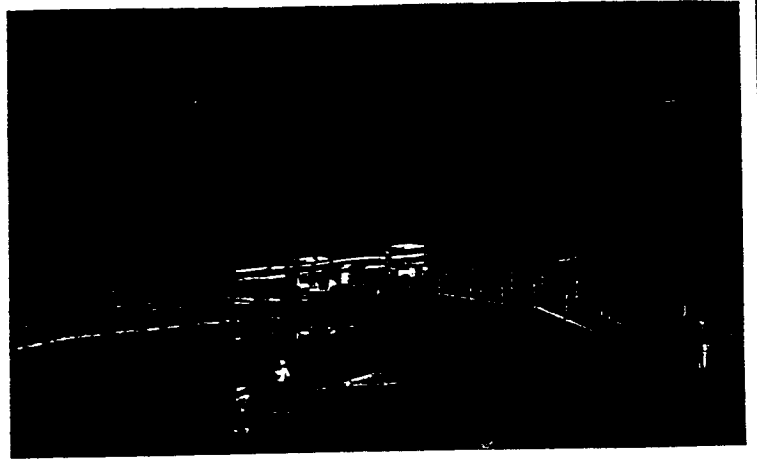
THE NEW YORKER

high. He had never seen or heard of anything like them. Since he had no collecting equipment with him, he tenderly plucked a few blossoms and tucked them between the pages of his passport. Later, he mailed them off to Professor Ames. It turned out that Schultes, on his very first day in Bogotá, had stumbled across a previously unclassified orchidological species. Ames dubbed it *Pachiphyllum schultesii*. "Here I was, taking a penny trolley-car ride in a strange city, and I made a discovery," Schultes says today. "I thought, God, what a wonderful country!"

At the institute, Schultes met Hernando Garcia-Barriga, a Colombian botanist who was about to go into the countryside for a short stay. He invited the newcomer to accompany him. The trip proved rewarding in an unexpected way: Garcia-Barriga knew very little English, and Schultes's Spanish further improved. Schultes remembers being impressed by his companion's telling him more than once that when he got to spend time with Indians he should bear in mind that they seemed to have some sixth sense enabling them to divine which of their many plants—marvellous plants, he said—to call upon when they fell ill.

Richard Spruce had travelled, when there was no watercourse, mostly on foot or on horseback. By the time Schultes came along, the explorer's lot was somewhat easier. There were trains, and roads, and some airplanes. Schultes's first approach to the Amazon River began with a two-day-and-two-night trek by bus to Pasto, near the Ecuadoran border, and then, by truck, he proceeded east to Sibundoy, the base of the Kamsa Indians. There was a Capuchin mission at Sibundoy, and priests put him up, as many other missionaries would do in later years. The priests also introduced him to two Indian medicine men, and these shamans acted as guides on his subsequent forays. Most of his early excursions into unsettled areas began in similar fashion—either at a mission (he generally got on much better with Catholics than with Protestants, some of whom were so intensely holier than thou that he can rarely allude to them without a prefatory "damned") or at a military outpost. He was always hospitably received; for the occupants of a mission or an outpost, the arrival of an educated white man was a real

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FRATELLI
ROSSETTI

treat. One army officer who hadn't had any such company for a long time, learning that his unexpected guest knew how to play chess, kept him all but imprisoned for several weeks.

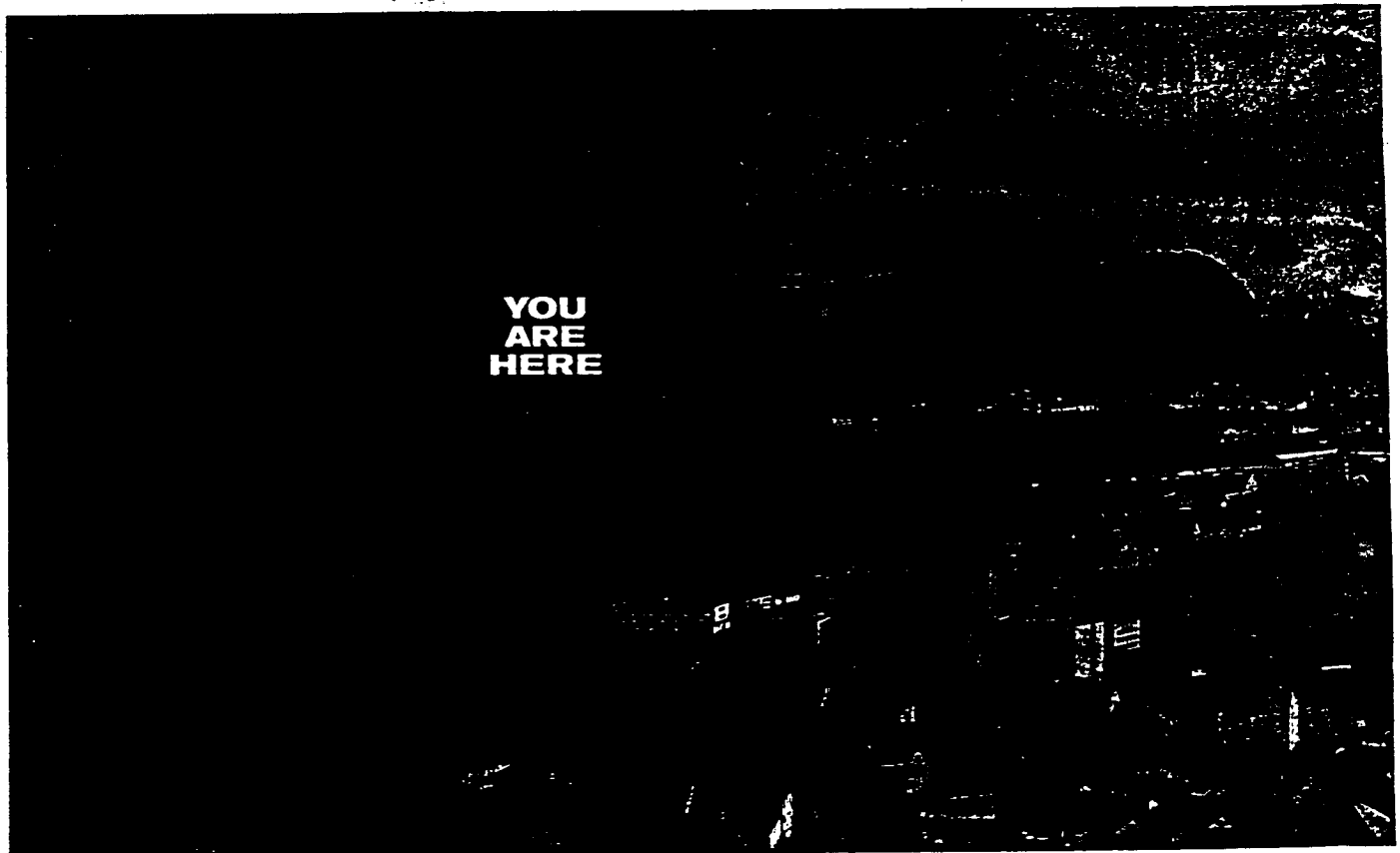
Although other botanists had long been aware of the muscle-relaxing properties of curare, when Schultes and his various guides set forth on its trail he knew not much more about it than that animals pierced with arrows whose tips had been daubed with it soon collapsed. "He to whom it comes, falls" was an Amazonian description of it. Schultes soon found out that there was quite an assortment of curares, of varying potencies and uses—this one to bring down birds, that one for monkeys, another for tapirs. The Indians who hunted with curare introduced him to more than three dozen kinds, which he segregated and labelled, for the convenience of chemists in Bogotá and Cambridge who would analyze them. His researches were the first steps toward identifying the more than seventy species of plants that can be used to make curare. Schultes would later assert, "How fortunate for modern medicine that scientific inquisitive-

ness led modern investigators to look at the curares—plant preparations employed by South American Indians to kill, yet the source of alkaloids capable, in the hands of surgeons, of safeguarding life when used as muscle relaxants?"

In late December, when news of Pearl Harbor caught up with him at a remote Indian settlement, Schultes—being of draft age, single, and robust enough to be leading an unarguably demanding life—packed up his curare samples and his notes and set out on a ten-day journey, by canoe and foot and bus, to Bogotá and its American Embassy, to make himself available for military service. His government had other plans for him. The rubber plantations in Southeast Asia had been cut off by the advancing Japanese, and the synthetic rubber available to the Allies had its merits but wasn't good enough to replace the genuine article in, for instance, the production of tires for airplanes. The procurement of real rubber had a high wartime priority.

When Richard Spruce was on the Amazonian scene, in the eighteenthies and sixties, the area had been

seized by rubber fever. The river-port city of Manaus became so prosperous that it boasted an opera house. The Indians who extracted latex from the trees around them could barely keep up with the demand. The advice of the Englishman, who discovered several previously unrecognized rubber plants (*Hevea spruceana* among them), had been much sought and much appreciated. But the boom didn't last. Amazonian rubber couldn't compete in the global marketplace with that of Southeast Asia. The trees there grew on well-tended plantations, in neat rows; a single worker could tap a hundred of them—a process sometimes known as milking—in a day. South American trees were scattered every which way. It took time and effort for workers to get to them. Moreover, by 1942, thirty years had passed since Amazonian production tailed off, so most living Indians had never, as the phrase went, "cut rubber." Before the wartime generation could start to do so, outlanders like Schultes had to help teach them a knack their ancestors had been all but born with. Having a full-fledged botanist on hand—and, moreover, one



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whose trained eye few rubber trees of old or new species could hope to elude—seemed providential to the war-production crowd up in Washington. Accordingly, Selective Service was asked to yield him to other branches of the federal government—first to something called the Rubber Development Corporation, and then to the Division of Rubber Plant Investigation of the Bureau of Plant Industry, Soils, and Agricultural Engineering of the Agricultural Research Administration of the Department of Agriculture. He stayed on the federal payroll, as a plant explorer, for a decade.

Schultes's first assignment was to count the adult rubber trees along the banks of a thirteen-hundred-mile stretch of the Apaporis River, which, in his nostalgic recollection, was "a wonderful river for botanizing." He simplified the task by deciding to count the trees on one side of the river and multiply by two. With several Indian companions, he set forth. The journey took seven months. At one point, Schultes's superiors back in Bogotá, concerned at not having heard from him for many weeks, sent a military plane to look for

him. He couldn't be seen and was presumed lost, but, luckily, nobody got around to notifying his family.

By the time Schultes was furloughed from Agriculture, he had collected thirty-five hundred specimens of *Hevea*, the genus whose member trees provide all of the globe's natural rubber, and had measured the latex yield of the trees the specimens came from. And, by the awed reckoning of his colleagues, he had superintended the gathering of three tons of *Hevea* seeds suitable for cultivation. He had become well acquainted with all of the nine known species of *Hevea* and had collected material from seven. He had, furthermore, discovered a whole new variety, the members of which seldom exceeded ten feet in height and were thus less likely than their taller brethren to be toppled by monsoons. Before long, Schultes had become universally recognized as a rubber expert, whose views commanded respect when, for instance, he wrote of *Hevea*, in terms few rubber-cutters anywhere were likely to comprehend, that "the biological significance of many of the morphological infraspecific variations to the

evolutionary development of this pliable genus must be obvious."

Soon after the end of the war, Schultes began travelling to various Asian rubber-producing countries, and, throughout the nineteen-eighties, he was still making annual visits to Malaysia. In 1990, the chairman of the Malaysian Rubber Research and Development Board acclaimed his expertise as "second to none." Nowadays, when other botanists come across varieties of rubber that defy easy recognition or classification they frequently turn to Schultes for enlightenment. Among a number of books he still plans to write is one to be titled "*Hevea: Rubber Trees in the Wild*." He has an entire filing cabinet of notes to milk for it.

RICHARD SPRUCE travelled light. When Schultes left Bogotá for more rural surroundings, he followed suit. It had become clear to him after only a few forays that heavy boots were an unnecessary precaution against snakebite—the snakes one ran into were arboreal, and so were more inclined to strike at necks than at feet. In due course, he reduced his basic impedi-



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menta to one change of clothing, a pith helmet, a hammock, a thin blanket, camera and film (black-and-white only), notebooks and pencils, a medical kit, formaldehyde and newspapers for plant preservation, and, for gathering specimens, a machete and clippers. He carried no firearms. Just once, he was persuaded to borrow a pistol for a couple of days, and that was while he was visiting an agronomic experimental station that was also the site of a penal colony comprising some of Colombia's most feared criminals. They weren't kept locked up, for two good reasons: they had to grow their own food, and they were surrounded by a near-impenetrable jungle. "Against the Indians one needed nothing," Schultes would say when he was asked if he ever felt endangered. On one occasion, when a less intrepid acquaintance attempted to warn him about a reputedly hostile tribe beyond the next mountain range, Schultes replied, "I do not believe in hostile Indians." He has described the assorted Indian chiefs he has known as "gentlemen." "All that is required to bring out their gentlemanliness is reciprocal gentlemanliness," he says.

Having arrived in an area he proposed exploring, Schultes travelled largely by water. His favorite craft was an aluminum canoe, eighteen feet long and weighing only fifty-three pounds; it could be handily portaged around rapids and other obstacles, yet could carry three men and a ton of cargo. He spurned larger, motorized, and more comfortable vessels even on the rivers they could navigate. They were not easy to bring to a quick halt, and he suffered from the impatience of, as he once put it, "every naturalist who has travelled in a vehicle which he himself does not command."

When it came to trafficking or bartering with Indians, he learned early not to bother with money or beads or other garden-variety trinkets. His Indians had no desire or use for them but were pleased to be proffered knives or scissors or cloth. "If I needed four or five men to go off on a canoe trip with me for four or five days and they seemed reluctant, I'd take some bright-colored cloth out of my pack and put it back in, but not before some wives had spotted it," Schultes says. "They made life miserable for their husbands until they agreed to accompany me." And then there were aluminum pots, with

SHIRTS

"Is there anything cleaner than a clean white shirt?"

—Octavio Paz.

There was no poetry waiting for my mother in the week's worth of shirts. Her arm would have to travel a long way, steering the small boat of the iron on a slow, repetitive journey up and down the backs of my father's shirts, the narrow channels of his sleeves, while "As the World Turns" was on the TV. She never asked for help, though I wanted to give it; instead she ordered me outside to play, saying I'd have to do this work soon enough someday—she didn't want a mother's little helper. I'm grateful to her for that, and for other freedoms she was never granted, like sleeping with a man who is not your husband. This morning, I watch from bed as you iron your white shirt, pleased that such an important thing as women's work does not come between us.

—MARIANNE BURKE

nested sets the undisputed favorites. Once, after he had come to understand the language of the Yakunas, he heard one woman say to another, as she was tapping the side of his canoe, "What a wonderful pot this would make!"

Whenever he was en route to an Indian settlement he had not previously visited, it didn't occur to him, he says, that his presence, however unanticipated, might be unwelcome. (Anyway, he was seldom a surprise; more often than not, word of his imminence was spread by jungle telegraph.) On reaching a new landing place, he wouldn't get out of his canoe until the oldest man around emerged from the communal residence—generally a large thatched hut where everybody slept—and offered to share some coca powder, a formality that was tantamount to a handshake. Then Schultes and any travelling companions would unload their gear, proceed to the hut, and be shown where to sling their hammocks. The rafters from which these hung sometimes housed boa constrictors—ideal pets for coping with rats. The itinerant American was careful not to have more than friendly relations with any Indian women. "It never crossed my mind to have any contact with any of them after the son of a medicine man mentioned casually to me that he'd once killed a white man for bothering his sister," Schultes recalled re-

cently, adding, "I happened to know the fellow he killed. He was a bastard."

While Schultes was always on the lookout for new medications or new therapies, he never contemplated relying entirely on shamans to attend to whatever might be ailing him. Nevertheless, his medical kit was modest. There was morphine, to enable him, if he suffered a broken bone, to endure being litter-borne to the nearest practitioner who could cope with it (that never happened), and there were vitamin pills and antibiotics—that was about it. He frequently came down with malaria, beriberi, and other illnesses. In one of his field journals he recounted that, one day—when a month and a half's worth of plant specimens had spoiled—he was running a very high fever, had rheumatic pains in every joint, and was violently nauseated. Yet what should he spot, crashing into the cabin of his boat—for once, he wasn't travelling by canoe—but a *Micrandra* minor! It was a member of the rubber family, and all the more bracing a sight because it was kin to *Micrandra spruceana*, the latex of which, Richard Spruce had earlier observed, was relied on by the Witotos to stem the flow of blood after the separation of the umbilical cord. Schultes felt better right away.

There were endless wasp stings and mosquito bites, though none of the

latter were comparable to those suffered by Spruce. "I constantly returned from my walks with my hands, feet, neck and face covered with blood," the British botanist wrote. "Many times, there is no sitting down to eat a meal, but one must walk about, platter in hand, and be content to eat one's food well peppered with mosquitoes."

To thwart the bushmaster and the fer-de-lance, Schultes was always glad also to have along some ampules of snakebite remedy made by a Brazilian laboratory, though he never had to resort to it. He was often faced with troubling decisions—whether to offer an antibiotic, say, to an Indian with an ulcerated wound. Though he might sometimes be called "white witch doctor," he wouldn't try to compete with a tribe's own pharmacist. "If you were to give an aspirin to a sick old man and he died the next day, you'd suffer the consequences," Schultes says.

Only once did he yield to compassion. On inquiring why some Indian women were crying, he was taken to the hammock of a teen-age girl whose leg was turning blue: gangrene—she'd been bitten by a bushmaster. Schultes got out his precious ampules. He explained that his antidote had been concocted for white bodies, and he didn't know whether it would work for others. And he requested—this he felt was crucial—that the women summon their shaman. He duly arrived, and over the next couple of hours, while the American gave the victim three injections, the medicine man, exhaling puffs of a presumably curative smoke, chanted solemn incantations. Schultes had to go downriver the following morning. When he came back upstream a week later, the girl was skipping about. "I'm sure the medicine man took most of the credit," the white witch doctor said afterward. "I didn't give a damn. I was happy to be credited with giving him a hand."

Schultes normally took along as provisions only canned instant coffee and canned Boston baked beans. It was usually too hot in the tropics for coffee to be grown. As for the beans, in boyhood he had supped on them (with brown bread) every Saturday night. When everything seemed at its bleakest in the jungle—specimens lost or damaged, malaria peaking, Indians disinclined to give him a hand—and he was faced with a choice, as he looks back on it, between suicide and open-

ing a can of beans, he would let suicide wait, and things would perk up at once.

Mostly, he ate whatever his Indian hosts ate. The staple food of the majority of them was a cereal made from tapioca. (He preferred that to standard urban Colombian fare. "In Bogotá, everybody seemed to eat steamed rice three times daily," he says. "After a spell of that, I could hardly wait to get back to the jungle.") There were few vegetables but many fruits: along with bananas and oranges, there were pineapples in all sizes, and every one, he reflects, sweeter than anything ever exported from Hawaii. There was fish (his favorite was a swordfishlike breed called tambaqui) and game—monkeys, mainly, but also tapir, deer, and large rodents called capybara. And when there wasn't enough food of any kind to go around, there was always coca.

During his jungle years, Schultes and coca were inseparable companions. Indulging in it, he had perceived from the beginning, was a significant part of regional life. With his habitual precision, he has described the experience:

A spoonful or two is put in the mouth. Conversation is impossible, until the powder has slowly been moistened and packed with the tongue between the gums and the cheeks. It is not chewed but is allowed gradually to mix with saliva and pass into the stomach. When the amount of the powder is thus diminished, it is replenished with an additional supply. Normally, a supply is kept in the mouth throughout the day. . . . Coca powder has an initial bitter taste which puckers up the mouth. The first noticeable effect is a slight anaesthetizing of the tongue and mouth; this is followed by a general stimulation. . . . The stimulation and capacity for performance and endurance which coca affords the individual and its ability to suppress hunger pangs gives the drug the role of an indispensable *vademecum* in the more or less itinerant life of deprivation which many Indians of the north-west Amazon must undergo.

Once resettled in Massachusetts—except for periodic returns to the Amazon—Schultes managed to wean himself from coca more quickly and easily than many of his contemporaries could give up cigarettes. "Until we stop the use of tobacco," Schultes said recently, "leave the Indian alone with his coca leaves."

ALL along, Schultes kept in touch with Harvard. In 1945, Oakes Ames was succeeded as director of the Botanical Museum—and teacher of Biology 104—by the corn breeder and scholar Paul Mangelsdorf; he kept

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Schultes on the institutional roster as an uncompensated research associate. Whenever Schultes took a leave from *Hevea* territory and headed north, he stopped by the old building to let it be known that he still existed. During one trip home, in 1942, he went to his sister's wedding. Some of the music was furnished by a young soprano named Dorothy Crawford McNeil, a Boston University M.A. in economics who was also a professional singer.

Richard and Dorothy took to each other, though to acquaintances of both they seemed an egregious mismatch. She knew nothing of science; he was a musical ignoramus. Politically, she was liberal; he was—and is—a conservative of the first order. (He has so low an opinion of the Democratic Party and its standard-bearers that he cannot bring himself to refer to Kennedy Airport except as "Idlewild," and in one Presidential election, his sensitive stomach having been turned by the names of all the slated candidates, he wrote in that of Queen Elizabeth.)

Dorothy and Richard did not become formally engaged before he had to head back south. It was more or less understood, though, that they would get together again whenever he returned permanently to New England's version of civilization. During the twelve years before that happened, he spent most of his time in the jungle, and she, between singing engagements in the Aleutians (with the U.S.O.), in Italy and Austria, at the Edinburgh Festival, and, most frequently, with the New York City Opera, helped make ends meet as a vocalist with Phil Spitalny's all-girl band.

THE longer Schultes dwelt in what is now popularly known as the rain forest (environmental fund-raisers find the word "jungle" unappealing), the easier it became for him to reach the Indians he wanted to associate with. As a newcomer to Bogotá, he had fallen in with a number of Army officers. Most were cavalrymen, and Schultes had often gone horseback riding with them, for exercise and fun. A decade later, some of those officers had attained a rank at which they could arrange for military hydroplanes to transport him and his canoe and his provisions far along an inland river, saving him many days of paddling and portaging. It does not make him happy to be reminded that while he was thus

handsomely treated other Colombians are responsible for the growth and distribution of so many of the plant-spawned scourges now infiltrating the United States. When he is pressed nowadays to comment on Colombia and the drug scene, he confines himself to some such utterance as "I love Colombia, and it's terrible what they've been going through."

Schultes prefers to think about that country's attempts to protect its rural population and their traditional landholdings. He gives the Colombian government high marks for having set aside a fifteen-million-acre enclave in the southwest, in 1986, for the use of eighty thousand Indians, chiefly Witotos—and decreeing, among other restrictions, that it was thenceforth to have no roads for motor vehicles, no hydroelectric plants, and no missionaries. (About this last restriction Schultes has mixed feelings. While he was grateful to the missionaries who helped him out when he was a jungle novice, he came to deplore the efforts of those who seemed to be always wanting to put clothes on people who could get along perfectly well without them.) It is within this vast tract that the two million acres designated Sector Schultes lie—an expanse nearly six hundred thousand acres grander than a sector honoring Simón Bolívar.

Colombia has reciprocated Schultes's affection in other ways as well. In 1953, the Universidad Nacional, in Bogotá, made him an honorary professor and gave him an honorary degree. In 1956, he became a member of the Academia Colombiana de Ciencias. In 1969, the government admitted him to the exclusive Order of Victoria Regia. In 1983, the then President, Belisario Betancur Cuartas, conferred on him the country's highest decoration, the Order of the Cross of Boyaca.

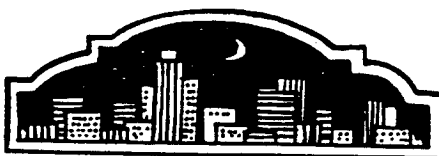
Schultes had by then survived an embarrassing encounter with a previous President, Eduardo Santos. In 1941, both attended the opening of a new home of the Institute of Natural Sciences, at the invitation of its director, Armando Dugand. Schultes didn't know that Santos was not only President but

also the owner of *El Tiempo*, a major daily paper. On their being introduced, the President, who spoke excellent English, said, "Tell me, Dr. Schultes, what do you think of the Colombian press?"

"Stupid Dick Schultes told him the truth," Schultes says. "I said, 'I have too much scientific reading to do to bother with newspapers anywhere, but I do know about Colombian ones. I buy them by the bushel.' His Excellency looked puzzled, and wondered why. 'To press plants,' I said, 'and on rainy days, if I can't go out after specimens and am bored, sometimes I read them.' Dugand was listening, and frowning. The President wanted to know which papers I took. I explained that *El Tiempo*—the others were mostly tabloids—was the best size for pressing. 'That's why you take it?' he asked. 'It's important to me, you know.' By now, Armando was trying to wave me off. But I plunged on, delighted to have the Presidential ear. 'Also, Excellency, they're the most absorbent,' I said. 'Ah,' he said. 'The most absorbent. I must share this intelligence with my editors.'"

Richard Spruce, like many a botanist before and after him, dried his plant specimens in the field. Here Schultes often departed from precedent. Dried plants tend to turn crisp and brittle. To keep his specimens more malleable until they could be further studied, Schultes would dilute his supply of formaldehyde, one part to three parts water, soak his plants in the mixture, and then sandwich them between sheets of *El Tiempo*. Next, he would bundle up his damp cache, stow it in rubber or plastic bags, and hope that a hydroplane or other accommodating carrier would turn up before too long and deliver them to the Institute of Natural Sciences. If no carrier came by for six weeks or so, Schultes would open up his bundles and pour in some more of the formaldehyde solution.

On a good day, out in the forest, Schultes would collect twenty or thirty specimens that he thought merited further attention. Along a riverbank, where foraging was easier, he sometimes bagged eighty or ninety. Inept at mathematics he might be, but he relished certain precise calculations: that in one nineteen-hundred-square-foot expanse of Amazonia, for instance, he had totted up sixteen hundred specimens, or that in a nearby area there



were at least forty-six varieties of tree, each of which had a trunk at least four inches in diameter. Finding a totally unfamiliar plant was what could make his day. His associates in the field maintained that his taxonomic eye could spot a novel flower or frond while he was barreling along a road at forty miles an hour. Once, Schultes and a close friend and colleague, the Swedish toxicologist Bo Holmstedt, of Stockholm's Karolinska Institute, were passengers in a chartered Piper Cub that nearly ran into some trees while taking off. Holmstedt recalled that while he was holding his breath Schultes seemed not only unperturbed but elated; as they bumped along, he had glimpsed a new species of the genus *Cecropia*.

Once the plants had been collected, they had to be written up. A not atypical Schultesian field note went, in toto, "26075. *Spathiphyllum*. Common in floodable swales in sunny places. Witoto = djè gai'-rè. Inside of spathe white. Fragrant at night. Root (which is rather woody & hard to dig out) and leaves & nifl. [flowering stalk] are burned to ashes for making 'salt' for the Virola pellets."

He made all his notes in pencil. "A lead pencil is wonderful," he says. "To begin with, you can erase, and if you want to stop and think you can chew on it. Chewing on a pencil has always helped me think." Every so often, though, his mastication would inspire gloomy thoughts. The reporter Margaret B. Kreig has passed along, in her estimable 1964 book "Green Medicine," an excerpt from a journal of "the foremost authority in his field" written while Schultes—suffering from malaria—was one of fourteen passengers on a decrepit barge limping along a tributary of the Amazon:

I am discouraged because the formaldehyde I bought is very inferior and nearly all of my collections for the past month and a half are rotten. . . . This afternoon I came down with a very high fever. Have rheumatic pains in every limb and back. . . . Vomiting continuously, very weak, probably mostly from malnutrition—we have had no warm food, only a tin of sardines for supper last night.

It sounded like baked-beans time.

Schultes usually did his writing after dark, by torchlight, or when it was raining. For a chair, he used a wooden stool that he carried around; for a desk, either his lap or a metal chest in which he stored film and anything else that had to stay dry. He was a tireless

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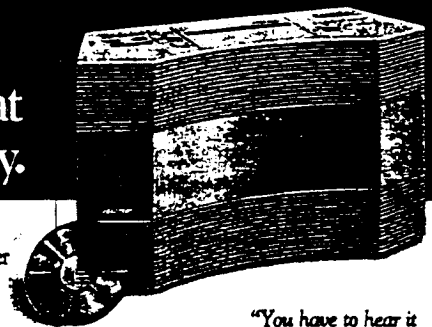
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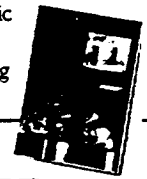


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photographer, and he trained one of his Indian helpers to take pictures of him. An exhibit of his photographs at Harvard in 1990 included one picture of a smiling bunch of scantily dressed Waikas with a near-naked and grinning Schultes alongside them. Another shot showed three men engaged in a Yukana tribal dance, all of them, to judge by their expressions, thoroughly stoned. Schultes would sometimes use that one in class to illustrate a point, and, after having it projected for no more than an instant, would say, "The one on the left has a Harvard degree."

During protracted rainy spells in the jungle, Schultes found many uses for his pencils. On and off, over a twelve-year stretch, he worked at translating the diary of an eighteenth-century Spanish botanist, Hipolito Ruiz, who spent close to a year in Chile and Peru. Schultes, having been convinced by a friend in the Colombian diplomatic service that the journal, a two-volume work, warranted publication in English, took it with him wherever he went, along with a Spanish-English dictionary. His years in the jungle have taught him never to be in a hurry. He began his translation in 1952, and

it will finally be published next year.

Schultes had more time for writing than reading because, like Spruce before him, he often went for weeks or months without mail. As he had told the proprietor of *El Tiempo*, he grew accustomed to a life style uncluttered by up-to-date newspapers. When he eventually resettled in Massachusetts, in 1954, he saw no reason to change that routine. To this day, he displays little interest in current events—except, perhaps, for a convergence of Commonwealth-nation Prime Ministers or a Harvard-Yale game. When the "Today" show was planning a segment on narcotics and thought a few learned observations on hallucinogens by him might fit in nicely, the functionary who phoned him was taken aback to hear him say, "The what show?" Schultes had never heard of it.

IN 1954, Schultes finally landed a full-time Harvard job—as the curator of Oakes Ames's fifty-thousand-strong orchidarium. Dorothy McNeil was still waiting. Nevertheless, Schultes continued to devote vacation months to the jungle, and he was loath to ask her to spend so much wedded time

alone. Eventually, on March 26, 1959, they were married, at King's Chapel, the Unitarian church where Schultes's father and paternal grandfather had worshipped before him.

In less than two years, the couple had three children: first a boy, and then twins—a girl and a boy. That two of the children were boys would have confounded some Indians living near certain carved rocks at La Pedrera, on Colombia's Rio Caquetá. For were not the inscriptions thereon thought to be fertility symbols, and had not every native man around cautioned that, as Schultes recorded the warning, "so powerful are these engravings still that he who looks upon them will produce only female offspring, never-

more begetting a male child"? And had not the botanist, then still without progeny, dared not merely to gaze at the stones but also to photograph them?

The elder son, Richard Evans Schultes II—he is known as Evans—worked his way through an industrial-management course at the University of Lowell by loading United Parcel Service trucks four nights a week, and he found the company so congenial that he has been with it ever since. The twins were both named for their maternal grandfather, Alexander McNeil. The boy, Neil, became another Harvard ibid, but in molecular biology. His father pretends to be unable to comprehend much of what he does. It is Neil who is now at Yale. His twin, Alexandra Ames, went to Wellesley and then to the Medical School of the University of Massachusetts. She married a fellow-doctor, and practices in Holden, Massachusetts.

The senior Schulteses didn't wish to live in Cambridge or in Boston. "I didn't want my children to be educated in any place run by Democrats, where school-board meetings regularly ended in fistfights," Schultes says today. So in 1959, even before they became parents,

the couple shopped around Republican-leaning towns and settled on Melrose, a community of some twenty thousand, a few miles north of Harvard. Melrose seemed ideal: no shopping mall, an Old Guard mayor with twenty unruffled years in office, a weekly newspaper that, according to Schultes, who occasionally glances at it, "will tell you Mrs. Jones is recovering from a hangnail," and an annual September celebration called a Victorian Day. Richard Spruce might have felt at home.

The Schulteses bought a thirteen-room house on a broad, tree-lined street. The previous owner had converted a spacious basement into a party room. Schultes converted it again—into a study and library, with space for several filing cabinets and four thousand ethnobotanical books. The wall of the stairwell leading to this retreat is covered with souvenirs of his career: documents attesting to his being a life member of the American Society of Pharmacognosy and a fellow of the Third World Academy of Sciences, of the American College of Neuropsychopharmacology, and of the National Academy of Sciences of India; and citations for assorted honors—among the more recent being the 1987 John and Alice Tyler Ecology-Energy Prize (a seventy-five-thousand-dollar one) for ethnopharmacological conservation, and the 1991 Charles A. Lindbergh Fund award as "the world's authority on hallucinogenic, narcotic, and medicinal plants... a living link to the great natural historians of the 19th century [read 'Spruce'] and to a distant era, when the rainforests stood immense, inviolable, a green mantle stretching across an entire continent."

Then there are, among yet more encomiums, a Doctor of Science degree from the Massachusetts College of Pharmacy ("I can't even read a prescription," the recipient says) and testimonial scrolls from the Botanical Society of Cuba and the World Wildlife Fund. The latter is signed by Prince Philip. It abuts a commendation from the Commonwealth of Massachusetts, signed by Governor Michael Dukakis. It irritates Schultes almost every time he negotiates the stairs that the Democrat's signature is larger than the Consort's. When Dorothy Schultes, who was born in Scotland, heard that a medal His Royal Highness once gave her husband included a couple of

ounces of gold, she popped it into a Melrose bank vault. She let Schultes keep, and wear, his Lindbergh trophy—a wristwatch designed by the Lone Eagle after his most celebrated flight. Looking at it recently in his Botanical Museum office at 9:37 A.M., Schultes said, "I could tell you what time it is in the other Cambridge right now if I could figure out how to run this thing."

At the very head of the cellar stairs perches a 1988 Golden Plate Award (actually, the plate is ceramic) from the American Academy of Achievement, a nonprofit organization that holds an annual "Salute to Excellence." Before leaving to accept that one, Schultes was informed that his fellow-honorees would include Minnie Pearl, Johnny Cash, Brent Scowcroft, and General Colin Powell. He asked his wife who in the world they were. "Don't worry, dear," Dorothy replied. "They've never heard of you, either."

After Schultes stopped devoting his summers to South America, the family began to spend extended vacations at Sutton Island, a tiny Maine retreat two miles off Northeast Harbor. Among its fewer than two dozen rustic residences were two belonging to Harvard, which the university rented to professors. Something that may have made the island especially attractive to Schultes was the challenging inconvenience—no roads, so that to reach the Schulteses' house the groceries and everything else had to be lugged by wheelbarrow for fifteen minutes up a steep, narrow trail paved with spruce roots and granite boulders.

HARVARD in the nineteen-sixties was, like much of the rest of the academic scene, preoccupied with Vietnam and with drugs. Timothy Leary and Richard Alpert, both nontenured faculty members in clinical psychology, were big men on campus. In Harvard Square, peddlers were hawking sugar impregnated with LSD—a dollar a cube. (Albert Hofmann had not anticipated that his discovery would become recreational.) By now, Schultes had wearied of trying anything like that again. In the jungle, when he turned to narcotics—the day-in-and-day-out reliance on coca excepted—he had customarily done so under the strict control of a medicine man or other recognized authority. Whatever proceedings Schultes took part in, he

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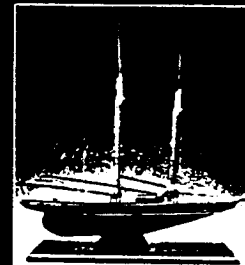
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says, were most often religious or therapeutic. "I never got scared," he says. "I did get color reactions, like colored clouds or mists going by, but, probably because I took limited dosages, I never saw visions." And, besides, there was sound scholarly justification for that kind of highly personal research: hallucinogens, he has written, constitute "one of the fundamental elements of human culture." His pronounced interest in those elements did result, on occasion, in his being seen as contributing to the undermining of youth. The bookstall at one botanical garden refused to stock his "Plants of the Gods" (written with Hofmann), despite the authors' having said in the preface, "This book is not intended as a guide to the use of hallucinogenic plants. Its purpose is to offer scientific, historical, and cultural documentation concerning a group of plants, which are or have been of importance in many societies."

Schultes likes to point out that very few of the exotic drugs he has touched on are grown in the United States, and that very few young Americans go to the Amazon. He has not yet figured out a way for the government to strike a sensible balance between supply and demand. "I'm not sure that legalization of any drugs is the answer," he says. "We live in a mechanized society. South American Indians don't drive automobiles. Their drugs alter space and time perspectives, which you need while driving. Some of my associates argue for the legalization of cocaine and marijuana, with heavy taxes on them. I don't go along with that. Rather, I would advocate removing bars and lounges from the vicinity of highways. That might help put alcohol in its place."

In the early nineteen-sixties, Leary and Alpert were studying psychotropic drugs at Harvard's Center for Personality Research. They had tested the hallucinogen psilocybin on prison inmates but evidently couldn't obtain satisfactory results from that exclusive group. So they had turned to others, including students. One doctor then on the university staff recalls, "In 1962 or 1963, at the Harvard Health Services, we were confronted by new and bewildering phenomena: marijuana, LSD, peyote. We were supposed to be experts. I had to interview Leary and Alpert about the safety of their using

drugs in their classes. A promise I extracted from them not to use drugs on undergraduates was the only leverage the college had in the end to fire them. Instant 'experts' were popping up everywhere: psychiatrists, pharmacists, moralists, and bureaucrats. One day, I had a flash of inspiration, and I went up to the museum and talked with Dick Schultes. No one had asked him anything. He knew more about these substances—and many others—than anyone else around. But he avoided the fray. His balanced view of marijuana amazed me in that era of hysteria on the part of the grownups and nonchalance on the part of the youth."



There was action on diverse fronts. Some of what Leary and Alpert were up to became widely known after the campus daily, the *Crimson*, sneaked a reporter into a meeting at the Center. (He was working with a Schultes student, who understood what the reporter had heard.) The *Harvard Alumni Bulletin* ran an illustrated two-page "Hallucinogenic Herbal" dealing with peyote, coca, morning glory, caapi, and teonanacatl. The magazine had done much of its research at the museum up on Oxford Street, and readers who wanted to know more were urged to consult Schultes's published works.

Leary and Alpert, for their part, also visited the museum, and once met Schultes. Later, in a memoir (which repeated an obscure rumor that Schultes—who has vigorously denied it—was a brainwashing operative for the C.I.A.), Leary stated that the professor had been cordial enough, but distant. "We felt like natives whose drug habits he was observing," Leary wrote. Schultes, who may have considered that a sensible way to appraise his visitors but has never put his reaction in writing, says he found them unimpressive. They had committed what were in his view three unforgivable sins: they persisted in using the word "psychedelic," which he maintains is both biologically inaccurate and etymologically unsound (he belongs to the "psychedelic" school); they misled an emissary of Harvard's President Nathan Pusey when they said they wouldn't experiment on undergraduates; and they misspelled the Latin names of plants.

Leary tried to get even. In 1963, when Pusey dismissed him and Alpert, Leary described a Harvard educa-

tion as "a dangerous narcotic and addictive drug."

IN the United States, Schultes was well enough known by the early nineteen-seventies to be invited to many trials involving drugs. Although his credentials as an expert witness could scarcely be challenged, lawyers would nonetheless do their best to nonplus him. When a prosecutor in a Michigan courtroom suggested that Schultes embarked on such jurisprudential ventures to attain higher social standing, the professor retorted haughtily—and with perhaps forgivable exaggeration, under the circumstances—"Do you think a fifth-generation Bostonian would come out here to get into the Pontiac *Social Register*?"

One of the more diverting trials he testified in took place in British Columbia. The engine of a small freighter out of South America and bound for Alaska had failed twelve miles off Vancouver. A storm came up, and the captain radioed the Canadian Coast Guard for help. On coming to the rescue, the Canadians found twenty tons of cannabis in the hold. The vessel was towed in, and all hands were arrested. The law under which the arrests were made specifically banned *Cannabis sativa*—one of three species of the plant. But the cargo was composed of *C. indica*, a species grown in the relatively dry desert area shared by Colombia and Venezuela. As soon as Schultes was asked by the defense to testify and was told the source of the cargo, he was sure that the contraband couldn't be *C. sativa*, which is partial to cool, wet areas. "Everybody knows this," he says. On being sworn in, he spent an entire morning explaining how the shipment couldn't be *sativa*, and had to be *indica* (why, it didn't even contain any of the wood fibre typical of *sativa*), and, to make things as easy as possible for the judge and jury to understand, he used hardly any Latin. For technical reasons, the case never went to the jury, but the experience confirmed Schultes's opinion that "lawyers and politicians shouldn't make laws like that without consulting technical people."

WHENEVER Schultes was at the Botanical Museum, he adopted a striking costume: suspenders ("braces" to him), crimson four-in-hand, and a starched, spotless, snow-white lab coat.

When elderly visitors who came to admire the glass flowers learned that they would have to climb two flights of stairs to do so, they sometimes expressed relief that there was a doctor in the house.

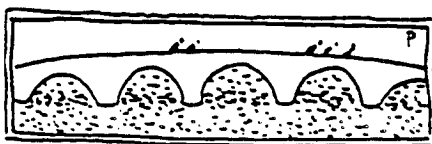
The glass flowers, which since the unveiling of the first ones, in 1888, have attracted about a hundred thousand viewers a year, were made by a gifted father-and-son team in Dresden, Leopold and Rudolf Blaschka. Between 1887 and 1936, the Blaschkas turned out eight hundred and forty-seven life-size and astonishingly realistic replicas of seven hundred and eighty varieties of flowering plants, not to mention more than three thousand additional detailed likenesses of parts of plants, diseased plants, and the process of pollinization. Professor George Lincoln Goodale, the first director of the museum (and the first instructor of Biology 104), had seen some Blaschka glass sculptures of marine invertebrates at Harvard's zoological museum. On a trip to Germany in 1886, he persuaded the artists to include flora as well as fauna in their field of expertise. The first few fragile flowers that crossed the ocean were damaged by clumsy customs agents, but, even so, they were seen and admired by Elizabeth C. Ware, the widow of a member of the Harvard class of 1834. As a memorial to her husband, Mrs. Ware, along with her daughter Mary, proposed underwriting a whole glass garden.

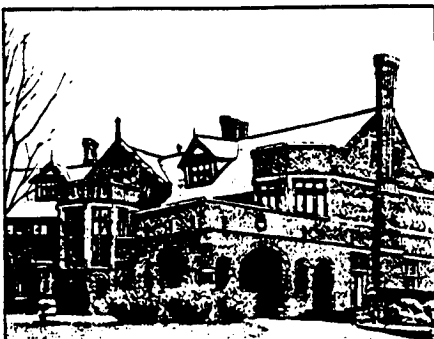
Over the years, a few of the flowers in the museum have been cracked by sonic booms. Schultes would hear a boom during the night in his Melrose bed—the planes responsible came from an Air Force base at Bedford—and would dread going to work in the morning. After a while, the Air Force graciously reined in its pilots until they were over the Atlantic. When the flowers are transported anywhere, they are exposed to other hazards. In 1893, a group of them was dispatched to the Columbian Exposition in Chicago for the outside world to appreciate. And a few flowers (including, appropriately, a tea plant, *Camellia sinensis*) were part of a display of Harvardiana at a Tokyo department store in 1974. Schultes

agreed to their departure only after the store provided two first-class plane tickets—one for a Mr. Box, who was a foam-padded receptacle specially constructed for the journey, and one for William A. Davis, who, as Keeper of Scientific Exhibits, tended the flowers for a decade. In 1976, when, for charitable purposes, twenty-five of the flowers were lent to Steuben Glass's Fifth Avenue store, Schultes chartered a plane from a company with a long record of gentle landings. There remained the problem of how best to ferry the cargo to and from airports. Keeper Davis did some research and ascertained that the springs on most ambulances did not absorb shocks as well as those on most hearses. Schultes accordingly hired hearses for the ground legs of the trip south, and they proved so successful that hearses took the flowers all the way home.

BY 1957, Schultes was giving Mangelsdorf a hand with Biology 104, and after Mangelsdorf stopped teaching, in 1961, to devote himself to cornbreeding, Schultes took over the course. In 1967, he became the director of the museum, and in 1970 he was finally made a professor. He held both posts until he retired, in 1985. During his incumbency, the course attained a certain campus renown. (When he gave it up, it went out of existence.) Throughout the years in which drugs were much on undergraduate minds, it had the fetching catalogue description "Plants and Human Affairs," and people who knew anything about the professor in charge knew that he'd been mixed up with a lot of peculiar plants, some of them stimulating in more than one sense. They also knew that he liked to bring one of his six-foot souvenir blowguns to class and give as realistic a demonstration of how to manipulate it as was possible in a cramped lecture room. He used missiles with undipped tips. (Schultes is modest about his prowess. "I am now somewhat out of shape," he said a few months ago, "but at my best I was never able to outshoot the natives. However ineptly handled, though, a blowgun is more effective than a shotgun. With the former, if you miss your monkey you can get in several more shots before he's aware of you. With a shotgun, the damn monkey is in New York before you can reload.")

Schultes was always hospitable to





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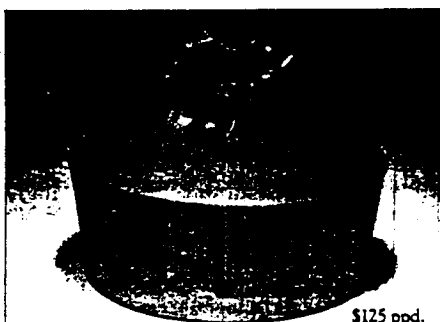
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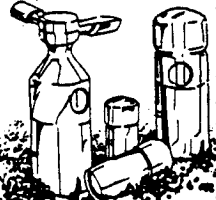
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those who sought out his pedagogy for any reason, but he soon discouraged run-of-the-mill curiosity-seekers by issuing them far more extensive reading assignments than they'd anticipated. He did not believe in coddling. When the federal government, to create longer weekends and leave mid-weeks intact, began observing various holidays on Monday, Schultes, who had a Monday-Wednesday-Friday class schedule, took it personally. He calculated that going along with the new order of things would deprive him of eleven lecture hours a year. His riposte was to set up Tuesday-evening replacements. These, to be sure, were voluntary, but he thought the students ought to know that examination questions just might pertain to information transmitted at one of the voluntary sessions.

Long after Schultes was a tenured professor of considerable seniority, he conducted a summer-school course one year even though only a handful of people had signed up for it. Long after his perks and privileges exempted him from such auxiliary chores, he taught night school. When someone asked why, he explained, "My first job is educating students, and night school is open to students who can't afford Harvard round the clock."

Schultes would read and reread and correct and annotate a single paper three or four times. He got and gets more mail—some from hippies who wonder if he can put them on to something really good—than he cares to acknowledge, or can. But recently, when a letter arrived from a stranger in Iowa saying that he'd seen a documentary film in which Schultes's blowgun prowess was featured, and that he hoped to go into ethnobotany, Schultes responded at length and by hand.

"This was a case where it was my duty to help a student," he said later. "I'll never say no to a legitimate student—especially considering what students have to pay in tuition nowadays. My own professors gave me all the time in the world."

Among former students who have made his field theirs, Michael J. Balick is Philecology Curator and director of the Institute of Economic Botany at the New York Botanical Garden. "The professor had never met me when I came out of a Costa Rican rain forest in 1975 and called on him in Cam-

bridge, but he treated me like a long-lost son," Balick says. Mark Plotkin is a vice-president of Conservation International, an environmental lobbying outfit in Washington. Siri von Reis, one of Schultes's few female disciples (her doctoral dissertation was about a hallucinogenic snuff used by South American Indians), is the co-editor, with Schultes, of an anthology of ethnobotanical essays. Enrique Forero, a Colombian who took botany under Schultes in Bogotá, is director of research at the Missouri Botanical Garden, in St. Louis. In 1982, out in the bush in western Colombia, Forero injured an eye. As soon as Schultes heard about it, he invited the young man to come to Massachusetts—"where we have the best eye doctors in the world"—and to stay at his home.

Dr. Andrew T. Weil practices natural medicine in Tucson, where he is on the faculty of the College of Medicine of the University of Arizona. "I'm the only physician who was a botany major and uses those studies in his work," he says. Before settling down professionally, he retraced some of Schultes's steps, as Schultes had retraced Spruce's, in the Colombian rain forest. "Being affiliated with Schultes opened doors everywhere," Weil says. "It was exciting to meet a number of elderly shamans who remembered his visits from their boyhood."

Some detached observers of the botanical landscape believe that specialists like Weil have limited horizons. Weil demurs. He recently collaborated, for instance, with Wade Davis, probably the most celebrated of the Schultes tribe, on a treatise entitled "The Identity of a New World Psychoactive Toad." In the best Schultesian tradition, when Weil and Davis carried on their research, on toads found in

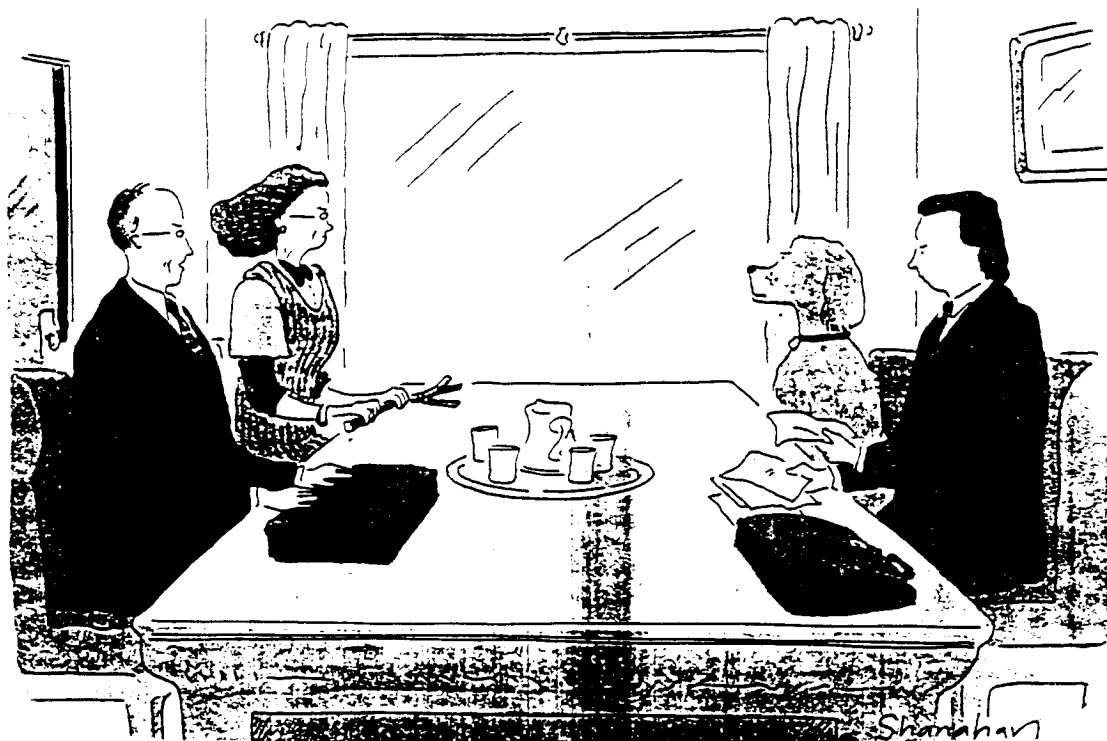


the Sonoran Desert of Arizona, early in 1991, they burned a chip made from the dried venom of a *Bufo alvarius*, inhaled the smoke, and, they reported, "experienced pronounced psychoactive effects"—in Davis's case, Schultes later read with admiration and respect, "a sense of the feel of the earth, the dry desert soil passing through my fingers, the stars at midday, the scent of cactus and sage, the feel of dry leaves through hands. . . . Warm waves coursed up and down my body." Davis added, "The effects lasted only a few minutes but a pleasant afterglow con-

tinued for almost an hour." Weil was less down-to-earth yet more matter-of-fact: "Profound alteration of consciousness within a few seconds of exhaling. I relax into a deep, peaceful interior awareness. There is nothing scary about the effects and no sense of toxicity. I try to describe my feelings but am unable to talk for the first five minutes and then only with some difficulty. This is a powerful psychoactive drug, one that I think would appeal to most people who like the effects of hallucinogens." In their joint proud words, their adventure provided the first documentation—although its existence had long been surmised—"of an hallucinogenic agent from the animal kingdom."

Davis graduated from Harvard in 1977. Eight years later, he published "The Serpent and the Rainbow," a study of Haitian zombies which attracted wide attention and was the basis of a movie. (The book was dedicated to Davis's parents and to two non-relatives—John Lennon and Richard Schultes.) In 1974, Davis, an anthropology major, had had an urge to inspect the Amazon region. "There was only one man to see," he later wrote in "The Serpent and the Rainbow." "Professor Richard Evans Schultes was an almost mythic figure on the campus at that time, and like many other students both within and outside the Department of Anthropology I had a respect for him that bordered on veneration. The last of the great plant explorers in the Victorian tradition, he was for us a hero in a time of few heroes." Davis went up to the Botanical Museum to solicit Schultes's counsel. The professor was quick to approve what he had in mind. He offered some advice: take a pith helmet and try ayahuasca.

NEW roles for plants or their parts are being explored more and more frequently: the possibility that the



"Three yummys, a pat on the head, and a 'Good doggy.'
That's my client's final offer."

isoflavone quotient of the soybean could combat breast cancer; the use of one species of skunk cabbage as a contraceptive; the use of the mayapple to treat venereal warts. In the nineteen-fifties, when Schultes and his fellow-botanists were out in the field prospecting for therapeutic greenery, some of the big pharmaceutical firms showed interest in their pursuits. On one visit back home, Schultes was invited by Robert Raffauf to join in an investigation of plants that seemed promising, on behalf of the company then called Smith Kline & French, where Raffauf had been installed, in 1951, as a natural-products field representative. Nearly a decade of on-and-off work followed without any lucrative results, whereupon the company's interest waned, and it began to concentrate, like most of its competitors, on synthesizing new drugs in laboratories.

There were exceptions to the anti-plant drift. In Indianapolis in 1954, the Eli Lilly phytochemist and pharmacognosist Gordon Svoboda, planning a survey of the properties of four hundred and forty plants, included a pantropical ornamental, native to Madagascar, called *Catharanthus roseus*, or rosy periwinkle. Svoboda knew that in the Philippines the rosy periwinkle

was considered a commendable anti-diabetic agent. He devoted the better part of ten years to the plant, along the way isolating thirty-six of the rosy periwinkle's ninety reported alkaloids. He was rewarded with two crystalline substances, vinblastine and vincristine—brand-new and unusually effective treatments for Hodgkin's disease and childhood leukemia, respectively. They were marketed as Velban and Oncovin.

Up to then, no alkaloid from any plant had figured in cancer therapy. Now that Svoboda's discoveries were in production, his appetite for raw material was insatiable. To make an ounce of either drug called for sixteen tons of periwinkle. Lilly had operatives all over the world gobbling up the stuff, but they couldn't find enough, so the company began growing its own on a plantation in Texas. Lilly was well rewarded: for a while, it sold a hundred million dollars' worth of Velban and Oncovin annually. Richard Schultes, who has long believed that some of the ways and means of jungle medicine should be accepted as inexplicable, felt himself rewarded when he heard Svoboda describe his periwinkle feat as "half alchemy and half witchcraft."

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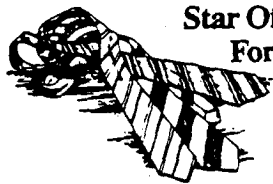
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back. The National Cancer Institute alone, at last report, was investigating fifteen thousand plants and other organisms every year. Synthetic chemistry, biotechnology, and microbiology still rule the pharmaceutical roost, but the new attitude was exemplified this past January by a two-day symposium at Rockefeller University, in New York City, where nearly four hundred people, most of them with a Ph.D. in one scientific discipline or another, spent two days discussing "Tropical Forest Medical Resources and the Conservation of Biodiversity." The gathering had been convened by the New York Botanical Garden's economic-botany institute and by the Periwinkle Project, a program run by a nonprofit Manhattan organization called the Rainforest Alliance. In its literature the alliance reminds its friends that fifty million acres of forest are disappearing annually—nearly a hundred a minute—and that as they are lost so is a plant species an hour, any one of which might have turned out to be a long-sought panacea.

Michael Balick and Sarah Laird, the organizers of the symposium, invited Schultes to come down from Cambridge for the occasion. He took no active part in colloquies like "Success Stories in Plant-Derived Medicine" (Gordon Svoboda, who is now a consulting pharmacognosist, was a featured performer in that one), but he loomed large among the cast of characters. So many of the younger people present who had only heard of him were eager to meet him that before long, to keep from being overrun, he took off his name tag.

Despite the relatively low priority that the big pharmaceutical companies had been giving to plant medicine, the makeup of the symposium suggested that they were beginning to hedge their bets. Among the sponsors or advisers or participants named in its program were SmithKline Beecham, Bristol-Myers Squibb, Merck Sharp & Dohme, and Monsanto. The company that most interested Schultes, however, was a fledgling California outfit called Shaman Pharmaceuticals. It deals exclusively in plant-derived medicines that have been prescribed by shamans for use in their own environment. Fourteen of the company's staff of twenty-six have Ph.D.s. Schultes was one of its first ethnobotanical advisers,

and most of its other advisers have been his students. Shaman Pharmaceuticals has begun clinical testing of four products—an antiviral, an antifungal, and two analgesics. Its founder, an enterprising young woman named Lisa Conte, thinks that the antiviral medicine, which her laboratory technicians winnowed from a fast-growing plant found from Mexico down to Paraguay, could—if it gets Food and Drug Administration approval and goes on sale—become a billion-dollar item. That would not displease Schultes. At the event that Shaman's stock eventually goes public, he has an option to buy several thousand shares at a very advantageous price.

At the end of the symposium, the participants—those, anyway, who had paid an extra twenty dollars for the privilege—trooped over to the Union Club for cocktails. Here Schultes' name tag was irrelevant, for the party was being given in his honor. The sponsors had wondered what would make a suitable gift for their drawing card, and they settled on something they were sure he would appreciate: a watercolor of—if he did object to their not presenting it under its Latin name—a rosy periwinkle. Schultes had been asked to give a ten-minute response, and generously obliged with one that went on for nearly half an hour. "It was almost like being in Bio 104 all over again," one audience member said. "I couldn't figure out until afterward, though, just what was missing. And then it hit me. Of course—the blowgun!"

Until his heart acted up in 1981, Schultes liked to go back to his jungle haunts at least every couple of years.

(His enforced change of haunts was all right with his wife Dorothy was afraid that now days sharpshooting government agents might take a very visible white man prowling around



down there for a narcotics hustler.) then, he had focussed his taxonomic attention far and wide. There was a standing invitation to stop by Malaysia. There was Sweden, where his friend and travelling companion Holmstedt was retired. Not far from Stockholm was the recently renamed St. Petersburg, with the welcoming botanists of the Komarov Botanical Institute. There were lab tests to be carried out and lectures to be given from Afghanistan to West Germany.

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and such other places as Argentina, Barbados, Belgium, Brazil, Canada, Costa Rica, Ecuador, France, Hawaii, Holland, Mexico, Oman, Spain, Sri Lanka, and Venezuela.

For Schultes, however, England was always the foreign country that counted most: England was Spruceland. He began going there in 1947, to scrutinize earlier explorers' collections of rubber plants, and for the last twenty years or so he has contrived to make further pilgrimages almost annually, and has become increasingly British himself along the way. He routinely spells "honor" with a "u," and he will not settle for an "among" when "amongst" can serve. He is currently being doubly and transatlantically "honoured." In London, he is receiving the Linnean Gold Medal—botany's equivalent of a Nobel Prize—from the Linnean Society, of which he was a fellow from 1950 until 1987, when he was elevated to Foreign Member. Back in Cambridge, a week later, on Commencement Day, it's the Harvard Medal—for "extraordinary service to the University."

Next year, he will be making yet another European journey. The hundredth anniversary of Richard Spruce's death will be observed in September, and appropriate ceremonies, with Schultes a prominent participant, are scheduled to take place in Coneysthorpe, Yorkshire, where Spruce spent his later years, and where Schultes is by now a familiar figure. During one of his visits to the humble cottage in which his English prototype died, Schultes arranged to have a plaque installed. During another visit, he found, dumped in an attic corner, some field notes of Spruce's that, when the tenancy next changed, might have been thrown away. Thanks to Schultes's vigilance, these are now safely enshrined in London's Royal Botanic Gardens. Schultes has already had Spruce's tilting tombstone straightened, and has had Spruce's "Notes of a Botanist on the Amazon and Andes" rescued from obscurity and reprinted, so the whole world can have access to it. As long as Richard Schultes lives, Richard Spruce won't die.

—E. J. KAHN, JR.

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