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About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

LV LA GUARD-9:35 AM
AR B.R. - 2:49 PM
via Dallas

Fl. 85
Fl. 190

25-II-'83

OR

LV LA GUARD - 3:00 PM
AR B.R. 9:00 PM

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AMER. AIR. BOSTON: 542-6700
NY : 431-1132

Subway to Harvard Sq.
Faculty Club, Mr. Coulson
20 (Quincy Street) (1-way)

Gordon arrives 9th. staying with friends.
Dick Schultes: (617) 495-2326
(Bot. Museum)

7-day notice required if date of return changed; or on "standby" basis from Boston, without prior notice. 7-day min.; 14-day max.

Dick Schultes
Office: 495-2326
Home: NO2-8449
"Please telephone me."

BOTANICAL MUSEUM OF HARVARD UNIVERSITY

OXFORD STREET
CAMBRIDGE, MASSACHUSETTS 02138

May 15, 1987.

Dear Bernard:

How kind of you to write to me concerning the Tyler Prize. I can hardly believe it, even now that I have the gold medal to prove that I received it! I deeply appreciate the honour, knowing that so many others have done so much more than I. The monetary part of the Prize will, after state and national taxes, be very helpful in keeping me in the field to carry on as long as these old legs will carry me in the Amazon.

With all best wishes & thanks,

Yours as ever,
Dick Schultes

BOTANICAL MUSEUM
HARVARD UNIVERSITY
26 OXFORD STREET
CAMBRIDGE, MA 02138, U.S.A.

RES

RETURNED TO SENDER

ATTEMPTED NOT KNOWN
FROM BATON ROUGE, LA 70803

Prof. Bernard Lo
Louisiana State
Baton Rouge,
Louisiana

How utterly stupid can American postal service become?

Dick

BOTANICAL MUSEUM OF HARVARD UNIVERSITY

OXFORD STREET
CAMBRIDGE, MASSACHUSETTS 02138

December 26/86.

Dear Bernard-

I could not phone you because of the holidays, and I did not have your home phone number.

Gordon Wasson died on the 24th. He had gone to his daughter's in Binghampton, New York, to spend the holidays, had a massive stroke and died within minutes.

There will be a funeral service in the National Cathedral on January 2 at 2PM in Washington.

I knew that you would want to know of his passing.

Hastily,

Dick Schultes

Department of Botany
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803-1705
504/388-8485

3-I-1987.

Dear Dick,

In a letter I received from Gordon dated 14 Sept. 1986, he told me of the imminent appearance of his new book "Persephone's Quest..." to be published by the Yale Univ. Press. He said that "Yale was enthusiastic over it..." It's a pity that he didn't live to see this latest product of his labours in print. About two years ago, Gordon sent me what was then his latest revision of chapter 1 for my comments, because, I suppose, it included some remarks about my Guatemala findings. When I had read his animadversions regarding the Sanskrit scholar Brough, who by that time was deceased, I recommended that he temper his displeasure somewhat for the sake of posterity's judgement. I don't know whether Gordon eventually did so. In any event, his unique and massive contributions to ethnomycology are his lasting monument.

Thanks for your thoughtful note.

Yours,
Bernard Lowy

Department of Botany
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803-1705
504/388-8485

11-V-1987

Dear Dick,

Congratulations on being awarded the Tyler Prize. How richly deserved! It could have come sooner, but that's a quibble.

All best wishes,

Bernard Lowy

Department of Botany
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803-1705
504/388-8485

14-XII-1988

Mr. Thomas J. Riedlinger
8514 Parkview Avenue
Brookfield, Illinois 60513

Dear Mr. Riedlinger:

I am gratified that my remarks appear to have escaped revisions, animadversions, or other editorial surgery. It had not occurred to me to choose a title, but the one you have selected is certainly quite appropriate.

My only suggestion is that authors should be identified with the institutions they represent.

With kind regards,

B. Lowy

B. Lowy

P.S. I am enclosing for you and Masha copies of one of Gordon's last letters to me, dated 14 Sept. 1986.

A Botanist and a Geographer Share This Year's Tyler Prize

By WALTER SULLIVAN

A botanist who has catalogued some 2,000 plants used in the tropics as medicines, narcotics and poisons, and a geographer who championed finding ways to live with recurring floods and hurricanes rather than fight them, are sharing this year's $150,000 Tyler Prize, awarded for outstanding research in environmental science.

The botanist is Richard Evans Schultes, retired director of the Botanical Museum at Harvard University, whose career has focused on plants of the Amazon region. The geographer is Gilbert F. White who, in addition to his work on human adjustment to floods, headed the Scientific Committee on Problems of the Environment, an international scientific body.

Under his leadership, from 1976 to 1982, the committee, created by the International Council of Scientific Unions, assessed the proposition that an all-out nuclear war would cut off sunlight sufficiently to produce a "nuclear winter." Its report, issued in 1985, agreed that the danger was real.

Dr. White was born in Chicago in 1911 and attended the University of Chicago, where he obtained his doctorate in 1942 after studying flood plain problems for several government agencies. He argued that in the long run it was more economical to curb construction in areas threatened by flood, hurricane or other disaster, than to build dikes and other defenses.

From 1946 to 1955 he was president of Haverford College in Pennsylvania. After serving from 1956 to 1969 as professor of geography at the University of Chicago he headed the Institute of Behavioral Science at the University of Colorado in Boulder and, later, the Natural Hazards Research and Applications Information Center there. He has also worked with the United Nations to combat the spread of deserts through misuse of land.

Dr. Schultes is known as a founder of the science of ethnobotany, the study of plant use in primitive societies. His work in the Amazonian jungles led him to join in the fight to save the rain forests of that region. It is said to harbor an estimated 80,000 plant species, compared to 1,900 in New England.

Over past millenia the native tribes have learned uses for substances derived from many of these plants, such as curare, with which they poisoned their arrowheads and from which a muscle relaxant widely used in surgery was derived. Pharmaceutical companies are continuing to test substances brought back by Dr. Schultes for medicinal uses.

The Tyler Prize was created in 1972 by John Tyler, founder of the Farmers Insurance Group, and his wife Alice, but he died the following year, before the prize was first awarded in 1974. It is now administered by the University of Southern California.

THE NEW YORK TIMES, MONDAY, MAY 11, 1987

In a report published today, The Herald said that Brian Smith, the photographer, was parked about one block away and across the street from Mr. Hart's town house last Saturday afternoon. Sometime between 2 P.M. and 4 P.M. Mr. Smith saw a maroon car stop in front of Mr. Hart's house, the newspaper said.

Mr. Smith's view of the town house was partly obstructed, the newspaper said. Mr. Smith said he believed that the driver had left the car double-parked in front of the house and walked to Mr. Hart's door while a dark-haired woman remained in the car.

Vision Was Obscured

"Then another man wearing a white sweater or sweat shirt walked toward the car with the driver," the newspaper said today. Mr. Smith did not see the man get into the car, nor did he see a blonde woman of Ms. Rice's description with the others.

At that point, Mr. Smith leaned down and took a photograph of the car, which, when developed last Thursday, showed two maroon cars.

After taking the photos, Mr. Smith follow a car as it pulled away, although he was unsure whether the man in the white shirt got into the car or walked back to the house, the newspaper said.

"Several blocks later, the car parked at a church and a man and a woman — definitely not Hart, Broadhurst, Rice or Armandt — got out," The Herald reported.

Mr. Smith returned to his observation post and reported that his sighting of the people and the car had been a "false alarm." A second member of the stake-out team observed no activity at the house, said Mr. Weitzel.

Mr. Smith did not return to Miami until Thursday. It was then that he read, for the first time, Mr. Broadhurst's account of the events that occurred on Saturday, the newspaper said.

# of Opportunity in Campaign

Hart's departure piques interest in the contest.

dominant now that Mr. Hart has left the race.

In his speech here Saturday night, Mr. Gephardt seemed to extend a hand to Hart supporters. "What has happened is a tragedy not just for Gary Hart and his family and his friends and

tion in Iowa, is expected to gain even more visibility now. Senator Albert Gore Jr. of Tennessee has only begun to campaign in the state, political observers say.

Senator Paul Simon of Illinois, in the meantime, was campaigning vigorously at Saturday night's Steak Fry, where he told his audience, "Paul Simon's going to be the nominee."

Poll Shows Dukakis Is Ahead In Contest Among Democrats

Last of the Victorian explorers

■ SCHULTES
Continued from Page 41

protection and research. He shared the $150,000 award with Gilbert F. White of Boulder, Colo., an environmental geographer and natural hazards expert.

Schultes is indeed a gentleman-explorer in the Victorian tradition; a scholar who has snorted jungle hallucinogens through hollow bird bones with the same grace as he takes coffee in the Harvard Faculty lounge. His bouts with malaria, beri beri and the paralyzing stings of the inch-long conga ant are inconveniences hardly worth mentioning. What really bothers him is parking meters: he considers them "abominations" and refuses to feed them.

"He isn't in the 20th century, really," said Robert Raffauf, a Northeastern University professor emeritus of pharmacognosy (the study of drugs of plant and animal origin) who has worked with Schultes for 30 years. Schultes, he notes, is a Royalist who wrote in the name of Queen Elizabeth II in the last two presidential elections. Scientifically, says Raffauf, "he's in the tradition of the Victorian gentleman scholars, the natural philosophers, who went off exploring and preserved their gentlemanliness in doing it all."

In the Amazon, Schultes lived with Indian families, sharing in native rituals such as drinking concoctions with ingredients that included burned human bones and fruits that had been chewed and then spit out and then allowed to ferment. But when abstract art replaced portraits of Harvard's founding fathers in the faculty dining room a few years back, that was too much for Schultes' digestion. He fired off a letter to the officials in charge of such things, and the portraits were reinstated, restoring order to his beloved Harvard. It's an institution with which he has been associated for 50 years, from freshman to professor emeritus, from a sophomore clerking part-time in the Botanical Museum library to the museum's directorship, a job from which he retired in 1985.

One year led to another

As a pre-med student, he signed up for a course in economic botany and thus was launched in his life work. He did an undergraduate honors thesis on Mexican Indian use of peyote. For his doctorate, he traveled to Southern Mexico to document plant use among Mazatec Indians. He was then awarded a grant to study the plants of Colombia's Amazon for one year. He stayed for 13.

On his first day in the country, he discovered an orchid new to science, growing on a hill outside the city of Bogota. He traveled overland on horseback until he reached the Putumauyo River, an Amazon tributary boiling with rapids. Then, guided by Indians

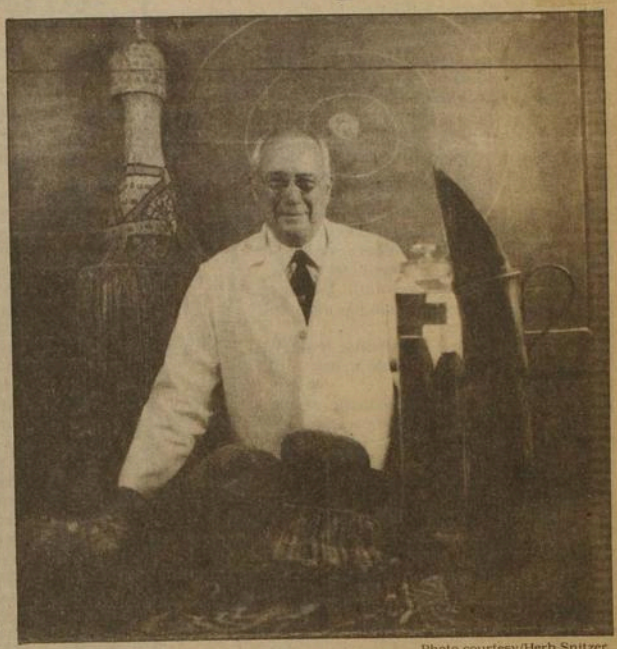

Photo courtesy/Herb Snitzer

Richard Schultes in lab with mementos of his travels.

he met along the way, he canoed deep into a steaming jungle loaded with biting ants, 8-foot-long snakes, malarial mosquitoes, and an estimated 80,000 species of plants. "A botanist's paradise," Schultes called it.

The rain forest promised a rich pharmacopeia. Indeed, most of the wonder drugs of the last 50 years have come from plants, he points out: penicillin, from a mold; cortisone, from yams; and muscle relaxants, from curare, a vine used by Indians for arrow poison. But "if chemists tried to study 80,000 plants from the Amazon for new medicines, they'd never get the job done," Schultes realized. The most efficient thing to do was to work with native peoples who over thousands of years have experimented with the plants around them.

So began his association with Amazon tribal peoples and their witch doctors, an association that continues. Schultes is successful, Raffauf says, because of his gentlemanly ways; he learns and respects the local languages and customs.

As Schultes explains it: "You never ask an Indian, 'Now, what do you use this plant for?' The Indian thinks of you as a superior person, and they're never going to say no to you. In the morning, you collect 25 trees, and at the 26th tree they might ask you, 'what do you want that for?' You say, 'I think this might be a cure for some of the diseases of my people.' I've invented more diseases, they must think we're more decrepit than we are. I'd say, 'indigestion.' They'd say, 'that won't help your people, but we use it for this or that.' "

Still makes annual treks

Schultes ended his sojourn and returned to Harvard in 1954. Since then, he has married, fathered three children, written more than 400 works (including 10 books, some of them in Latin and Spanish) and taught biology and natural sciences.

With the exception of last year, when surgery stalled his plans, he leaves Harvard and his 13-room Victorian home in Melrose annually, drawn anew to the Amazon for at least a month's work. It's a commute between cultures, but the gap, he sadly reports, is closing.

Indians who once dressed in grass skirts and barkcloth wear jeans and outfit their hollow log canoes with outboard motors. Business and tourism are destroying the rain forest at a rate of more than 1,000 square miles a month, wiping out plant species before they can be studied, and ruining the tribal way of life.

"When roads go in, airstrips are made, where missionaries and commercial people and tourists come and these people can get our medicines – they're not going to walk into the forest for one piece of bark to make a tea. They almost immediately forget their plant lore," Schultes explains.

"Ethnobotanical conservation is to get this information down, for our own knowledge, before it is all lost."

Sy Montgomery is a freelance science writer who lives in New Hampshire.

It's not that there's evidence of a lack of effect, it's lack of evidence."

Meanwhile, the two top American cancer organizations, the federal National Cancer Institute and the private American Cancer Society, say the panel used overly stringent standards for judging the research on breast self-examination. Both organizations remain dogged in advising all women to examine their breasts once a month. Mammograms and doctor's exams, depending on your age, are the gold standards in breast cancer detection, they say, but there's no reason to drop self-exam.

In fact, the Massachusetts chapter of the American Cancer Society is in the midst of a campaign to provide 15,000 women with low-cost mammograms and instruction in self-examination.

Where does this leave women who want to know what to do? Confused, that's where.

The new, unenthusiastic report on breast self-examination was published April 24 in the Journal of the American Medical Association. It's the first product of the US Preventive Services Task Force, formed in 1984 to formulate priorities for pre-

HEALTH SENSE, Page 44

Globe staff illustration/Anthony Shultz

Super Collider r answers, physi

Drive to find unifying 'theory of ever

By Richard Saltus
Globe staff

It began in a violent blast from a single point of energy, inconceivably hot and dense, where space, time and matter were one.

The universe at that moment was a fiery seed. As it expanded and cooled – though still so hot that temperature was virtually a meaningless term – the primordial fireball unleashed the forces and building blocks of nature. In a flash, the laws of physics themselves were forged.

In less than a trillionth of a second, a single "superforce" lost a property called symmetry: one by one, what we now observe as the four forces that drive all of nature broke away as separate entities.

First gravity appeared; then the "strong force" that would bind the elementary particles inside the nucleus of atoms. Last, the weak force (governing radioactive decay) and electromagnetism crystallized out, like snowflakes condensing from a wintry sky.

The universe was approaching a mile in diameter when more symmetries shattered, and the basic constituents of atoms sprang into being. Less than ten-thousandth of a second had passed since the Big Bang, but a blueprint of nature had been drafted. Within three minutes, the forms of matter that would create stars and galaxies and, eventually, ourselves, had taken shape.

As everything cooled, the original symmetries of the universe remained locked away in its early history, never

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INSIDE

Photo courtesy/USC

Young Richard Schultes in the northern Ama-

THE BOSTON GLOBE MONDAY, MAY 11, 1987

PROFILE

The last Victorian explorer

At 72, Tyler prize winner Richard Schultes still trekking jungle

By Sy Montgomery
Special to the Globe

When Richard Evans Schultes was growing up in Boston, other boys idolized Charles Lindbergh. Schultes' hero was Richard Spruce, an obscure Victorian botanist from Yorkshire, England.

Spruce had spent 15 years collecting plants in the Amazon and the Andes in the mid-1800s. Almost a century later, Schultes would follow in his hero's footsteps, traipsing animal trails through the lush jungle and canoeing the Colombian rapids in his search for new plant species. He believes he has touched some of the very trees Spruce sampled.

In his 45 years of botanical exploration, Schultes has come to be widely credited with founding the scientific discipline known as ethnobotany, the study of how people use their native plant resources in food, drugs and rituals. He has uncovered 2,000 or poisons, hundreds of them new to science, and many of them under study for potential applications in modern medicine. One has yielded an inexpensive, biodegradable insecticide.

Now a robust 72 and still making annual treks into the Amazon, the bespectacled Harvard professor emeritus is "the last of the Victorian explorers," as a former student, World Wildlife Fund director Mark Plotkin, describes him; a man who has charted the jungle without Gore-Tex or fancy gadgets, and through it all remained a gentleman.

Another Wildlife Fund director, Russell A. Mittermeier, calls him a "direct link to the great explorers of the past," to people like his hero Spruce and to Charles Darwin.

Others, too, recognize his contributions. Schultes was honored Friday with the prestigious 1987 Tyler prize for his work in environmental

SCHULTES Page 42

DEDICATION

OF THE

TINA AND GORDON WASSON ETHNOMYCOLOGICAL COLLECTION

BOTANICAL MUSEUM OF HARVARD UNIVERSITY
OXFORD STREET
CAMBRIDGE, MASSACHUSETTS

Saturday, February 12, 1983 ***7:30 P.M.***

Dean Henry Rosovsky, Harvard University: Greetings from University Hall

Dr. Alan E. Erickson, Science Specialist in the Harvard University Library

Dr. R. Gordon Wasson: Response

Brief greetings will be given from specialists in the diverse fields of the inter-disciplinary area of ethnomycology

Prof. Wendy Doniger O'Flaherty, Professor of the History of Religion and Indic Studies, Divinity School, University of Chicago

Prof. Bernard Lowy, Botany Department, Louisiana State University

Prof. Carl A. P. Ruck, Department of Classical Studies, Boston University

These brief greetings will be followed by a reception to Dr. R. Gordon Wasson, a visit to the library and collection and a social period during which coffee, tea, wine and cheese will be served.

This Dedication is in partial recognition of the 125th anniversary
of the founding of the Botanical Museum.

RSVP

(over)

SOCIAL

Wine and cheese at Harvard Square,
Bel Paese, Bikaver,
Dainty tarts, discrete hors d'oeuvres,
All are getting on my nerves.
Fingers twitch each prize to grasp,
The line is long, and Im the last.
A room that's bursting at the seams,
A crowd of famished academes.
I worm my way thru thick and thin,
Professors and their dames unslim,
College dons, high mucksamuck,
A hand thrusts out, and there I'm stuck.
Doomed to chat with Dick and Mabel,
I'll never make it to the table.

28-I-1983

BOTANICAL MUSEUM • HARVARD UNIVERSITY • OXFORD STREET • CAMBRIDGE, MASSACHUSETTS 02138, U.S.A.

OFFICE OF THE DIRECTOR

March 7, 1983

Professor Bernard Lowy
Department of Botany
Louisiana State University
Baton Rouge, Louisiana 70803-1705

Dear Professor Lowy:

This will acknowledge your letter of February 24th to Dr. Schultes in which you enclosed the air travel voucher in connection with the Wasson Library dedication.

Mr. Frank Stevens, our financial person, has processed this for payment to you. You should expect a check within the next week. If for any reason the receipt of the check is delayed longer than seems reasonable, please either write to me or telephone (617) 495-2326.

Sincerely yours,

Mary R. Gaudet

Mary R. Gaudet (Mrs.)
Staff Assistant

g

OFFICE OF FINANCIAL SYSTEMS
HARVARD UNIVERSITY
Holyoke Center 380
Cambridge, Massachusetts 02138

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BERNARD LOWY
REIMB TRAVEL EXONS

AMOUNT 198.00

for travel Baton Rouge - Boston, dedication of Tina & Gordon Wasson Ethnomycological Collection.

HARVARD UNIVERSITY
CAMBRIDGE, MASSACHUSETTS

Department of Botany
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803-1705
504/388-8485

24-II-1983

Prof. Richard E. Schultes
Botanical Museum
Harvard University
Oxford Street
Cambridge, Mass., 02138

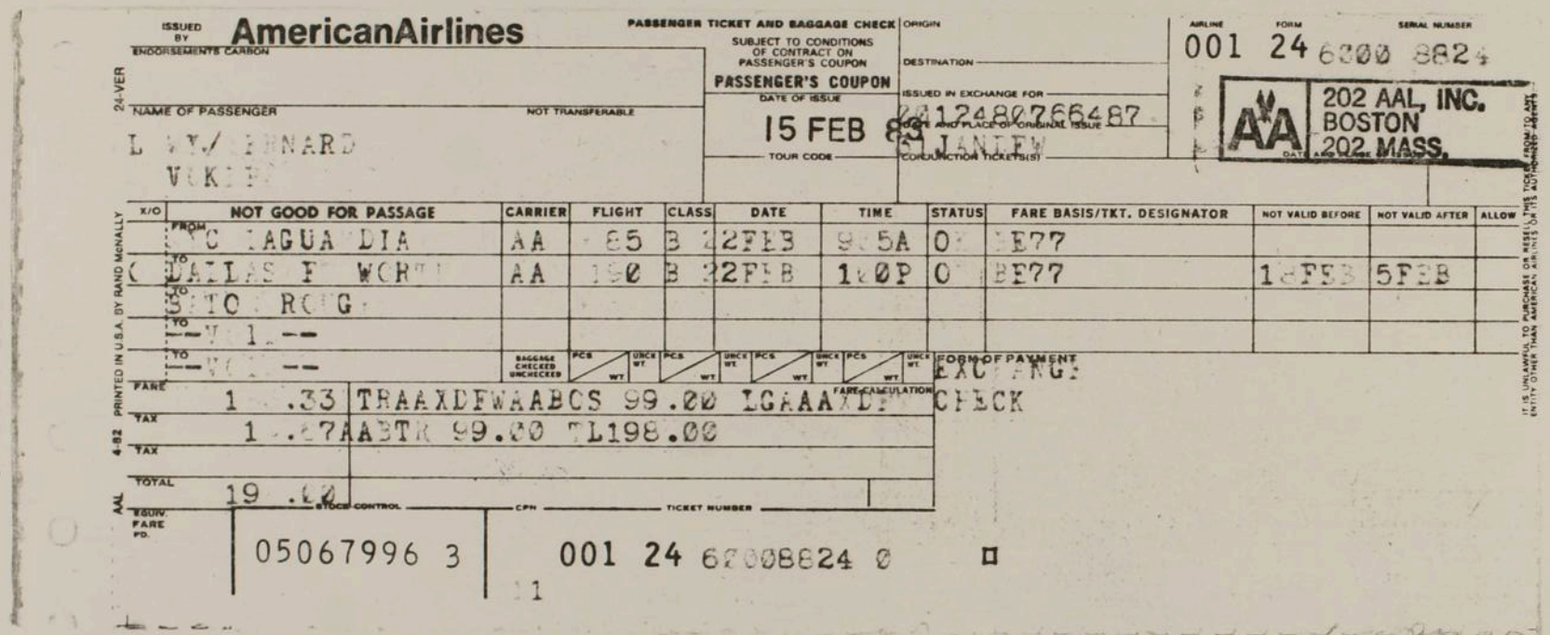
Dear Dick:

Following the dedication ceremonies I spent almost a week with my daughters before returning home. Gordon again invited me to visit him in Danbury, immediately after the talks, but it would have been difficult to arrange on such short notice, and I could not abandon my daughters. In any event, it was apparent that Gordon was greatly pleased with everyone's efforts.

On your recommendation, I am enclosing the expense voucher ($198.00) for my round trip transportation costs from Baton Rouge to Boston. Many thanks for your kindness in giving my daughters and me a special tour of the premises prior to our meeting, and for accommodating me so comfortably at the Faculty Club.

With best regards,

B. Lowy



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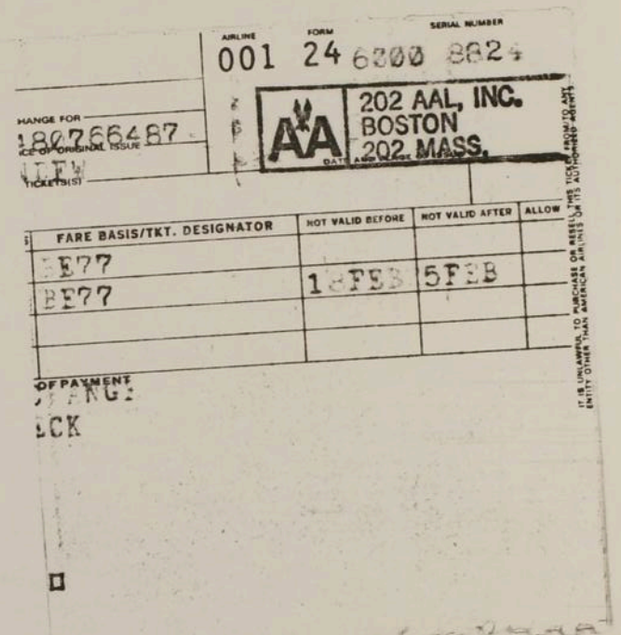
* Baton Rouge-Boston $198.00



SOCIAL

Wine and cheese at Harvard Square,
Bel Paese, Bikaver,
Dainty tarts, discrete hors d'oeuvres,
All are getting on my nerves.
Fingers twich each prize to grasp,
The line is long, and Im the last.
A room that's bursting at the seams,
A crowd of famished academes.
I worm my way thru thick and thin,
Professors and their dames unslim, (within)
College dons, high mucksamuck,
A hand thrusts out, and there I'm stuck.
Doomed to chat with Dick and Mabel,*
I'll never make it to the table.

BL

* Schultes

28-I-1973

SOCIAL

Wine and cheese at Harvard Square,
Bel Paese, Bikaver,
Dainty tarts, discrete hors d'oeuvres,
All are getting on my nerves.
Fingers twich each prize to grasp,
The line is long, and Im the last.
A room that's bursting at the seams,
A crowd of famished academes.
I worm my way thru thick and thin,
Professors and their dames unslim,
College dons, high mucksamuck,
A hand thrusts out, and there I'm stuck.
Doomed to chat with Dick and Mabel,
I'll never make it to the table.

BL

DEDICATION

OF THE

TINA AND GORDON WASSON ETHNOMYCOLOGICAL COLLECTION

BOTANICAL MUSEUM OF HARVARD UNIVERSITY
OXFORD STREET
CAMBRIDGE, MASSACHUSETTS

Saturday, February 12, 1983 ***7:30 P.M.***

Dean Henry Rosovsky, Harvard University: Greetings from University Hall

Dr. Alan E. Erickson, Science Specialist in the Harvard University Library

Dr. R. Gordon Wasson: Response

Brief greetings will be given from specialists in the diverse fields of the interdisciplinary area of ethnomycology

Prof. Wendy Doniger O'Flaherty, Professor of the History of Religion and Indic Studies, Divinity School, University of Chicago

Prof. Bernard Lowy, Botany Department, Louisiana State University

Prof. Carl A. P. Ruck, Department of Classical Studies, Boston University

These brief greetings will be followed by a reception to Dr. R. Gordon Wasson, a visit to the library and collection and a social period during which coffee, tea, wine and cheese will be served.

This Dedication is in partial recognition of the 125th anniversary of the founding of the Botanical Museum.

RSVP

(1982)

Department of Botany
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803-1705
504/388-8485

24-II-1983

Geraldine C. Kaye
The Farlow Herbarium
Harvard University
20 Divinity Avenue
Cambridge, Mass., 02138

Dear Ms Kaye:

I have at hand an updated copy of my c.v. which I am enclosing for your confidential files. It may be used in any legitimate way by qualified scholars, subject only to written notification of their intent to do so prior to such use.

With best regards,

Sincerely yours,

B. Lowy

Bernard Lowy
Professor Emeritus

BOTANICAL MUSEUM • HARVARD UNIVERSITY • OXFORD STREET • CAMBRIDGE, MASSACHUSETTS 02138, U.S.A.

OFFICE OF THE DIRECTOR

January 21, 1983

Prof. Bernard Lowy
Botany Dept
Louisana State University
Baton Rouge, La.

Dear Bernard:

We have made reservations for you at the Harvard Faculty Club on Quincy Street, Cambridge, for the nights of February 11th and 12th. Please telephone me upon your arrival.

Could you make travel arrangements to suit your convenience? We will reimburse you when you submit your expenses. If this is not convenient, please telephone me: office - 617-495-2326; home 617-NO2-8449.

Gordon and all of us are pleased that you can take part in what we hope will be an extremely meaingful affair.

We would like each speaker to limit himself to 10 or 12 minutes and to realize that the audience will be composed of people from many different fields, not specialists in any one field.

Sincerely yours,

Dick

Richard Evans Schultes, Ph.D.
Jeffrey Professor of Biology
Director, Botanical Museum

RES/kh

Department of Botany
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803-1705
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29-XII-1982

Dear Gordon,

Your manuscript is terse and convincing. Apart from my previous criticism, there is nothing substantive that I would add or detract. A very few non-essential corrections or suggestions are indicated.

All my best wishes for the New Year!

Bernard

manuscript returned: 29-XII-'82

*

From the village of San Agustín Loxicha, in Zapotec country, we will now visit the lands of the Maya, a few score miles due east as the bird flies, where the natives speak Tzeltal and Tzotzil, Mayan tongues in the Mexican State of Chiapas; and some score miles further, in the Guatemalan highlands where they speak Quiche and Tzutuhil. The Quiche were and are the most numerous of the Maya peoples. It is they who have left us as a legacy the Popol Vuh, a Preconquest poem almost 8600 lines long, which has inspired many translations into Spanish, English, French, German, and Russian, plus two translations from these languages into Italian and Japanese. Mushrooms are mentioned expressly once in the Popol Vuh, in what is a religious context. The mushroom caps lie in deerskin and are carried to the top of the mountain,--doubtless a sanctuary.[1] We are not told their species nor what was done with them.

The mycologist Bernard Lowy, now retired from his chair in the State University of Louisiana, had ~~chosen~~ traveled many years ago to pursue ~~part-time~~ my subject -- ethnomycology -- and early on chose ~~the land~~ of the Maya to see what discoveries he could make in that ancient and storied land. In the last decade he has made a dramatic break-through, reenforcing mightily the trend of my findings, already strong. Knowing of my addiction to lightningbolts and mushrooms, when he went down in June of 1973 to Guatemala he felt the need to familiarize himself with the vocabulary for lightning in the Quiche language. To this end he consulted the professional linguists of the Proyecto Francisco Marroquín in Antigua and specifically Dr. William Norman, a specialist in Quiche. He learned that in Quiche kakuljá is the word for lightning.[2] But did it correspond with rayo in Spanish or simply with relámpago? Rayo, definitely. Rayo is the powerful word corresponding to foudre in French. Rayo provokes the tension of a nearby flash of a blinding lightningbolt and a deafening clap of thunder. Relámpago corresponds to éclair in French and, as he was told, to xkoyopá in Quiche. English is singularly weak in its thunderstorm vocabulary.

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1. The Book of Counsel: The Popol Vuh of the Quiche Maya of Guatemala, tr. and ed. by Munro S. Edmonson, Publication 35, Middle American Research Institute, Tulane University, 1971; line 6266.
2. 'Amanita muscaria and the Thunderbolt Legend in Guatemala and Mexico ~~etc.~~', by ~~Bernard~~ Lowy, Mycologia V. LXVI.1, Jan.-Feb. 1974.

In July of that year Prof. Lowy went to Chichicastenango, in the heart of the Quiche country, some kilometers north in the forest-covered mountains, and gathered specimens of Amanita muscaria and A. caesarea. He brought them down to the marketplace in the city and displayed his mushrooms to the women mushroom vendors squatting on the sidewalk. They knew his mushrooms at once and he was admonished not to eat the kakuljá: it was itzel ocox, the 'evil or devilish mushroom'. So kakuljá, 'lightning' in Quiche, really was the ordinary name of the fly-agaric! Originally it must have served as a metaphor, a powerful euphemism, but now no one thinks of 'lightningbolt' when using the word. Lowy asked the women to pronounce the name slowly and carefully. It was the same as the word for lightning, unmistakably.

In the summer of 1978 Prof. Lowy spent some time in Santiago de Atitlán, where Tzutuhil is spoken. There he [investigated the picked up the elements of] beliefs concerning their gods in which, it seems, they still believe. I shall give these beliefs as he recorded them, in a document, dictated to him by a foreign resident of the village. Here is what he wrote down:

> According to Tzutuhil legend as narrated to me by Martin Prechtel, a talented painter and linguist living in Santiago de Atitlán, there once were 12 sacred trees, each of them associated with a different species of mushroom. The Nahuales decided to select one of these trees to rule over men on earth. Each tree in turn was asked whether it would accept the heavy responsibility. Only one accepted, an unlikely, undersized candidate called chipi or Little Brother. He said he had a dream or vision in which he was directed to find a certain hill at the foot of the volcano San Lucas (still venerated by the Tzutuhil) where a tree called the palo de pito grew surrounded by numerous mushrooms. As the tree was approached, a strong south wind arose bringing with it a violent storm, and presently the tree was split by a thunderbolt. The tree was hollow, and within it chipi observed a vague countenance which he then proceeded to carve out of the soft wood. This effigy became the god Maximon. Each stroke of chipi's knife was accompanied by a sacred word, and each stroke likewise gave origin to a musical note, tone, or son. The notes provided the musical basis for traditional songs. When Maximon was fully formed, each Nahual conferred upon the newly created god a special power. Then Maximon was commanded to stand, for he was to be tested to determine whether he was able to use the powers conferred upon him. A deaf mute from the village was brought before him and Maximon was directed to cure his infirmity. According to one version of the legend, a fragment of one of the mushrooms growing around the palo de pito was fed to the man, who thereupon became rejuvenated and his infirmity disappeared. The Nahuales were pleased,

and Maximon has ever since presided over the Tzutuhil people. It is this divine mushroom which is known among the Quiche as kakuljá, only recently identified as Amanita muscaria and which takes its name from the Maya god whom it personifies. Kakuljá is one of a trinity of gods referred to in the Popol Vuh as kakuljá huracán, the others being chipi kakuljá, and raxa kakuljá.

The first of these, kakuljá huracán, enigmatically refers to a single leg, huracán , that is, the single shaft of the thunderbolt. Where this shaft struck the earth the miraculous mushroom Amanita muscaria arose.

Martin Prechtel is married to a Tzutuhil woman. The palo de pito is a leguminous tree, Erythrina rubrinervia. Prof. Lowy's account of the Tzutuhil folk belief appeared for the first time in the spring of 1980, in the Revista-Review Interamericana, p. 100, Vol. 10 No. 1, Professor John Zembrowski is the Director-Editor of the Revista and he graciously granted us permission to quote from Prof. Lowy's article.

The clergy in the Quiche country and, later, the anthropologists and linguists ~~there~~ were of West European stock and therefore probably mycophobes, who ~~despised and~~ ignored the toadstools of the country, until Prof. Lowy turned up in 1973 with his persistent questions. Scholars only now are, a few of them, learning of the importance of entheogenic mushrooms in prehistory, ~~among~~ our own Indo-European ancestors who had not yet learned the art of easy writing. Do those among the Quiche who characterize the kakuljá as itzel ocox believe this, or may these short words serve as an amulet to free them from the disapproval of the authorities? Are there still Quiche or Tzutuhil who ingest the kakuljá according to age-old rites?

In Chiapas the vocabularies of both the Tzeltal and Tzotzil also link the fly-agaric with the lightningbolt mushroom. Dr. Robert M. Laughlin of the Smithsonian, the authority on Tzotzil, tells us that the fly-agaric is called tzajal yuy chauk, meaning 'red thunderbolt's yuyo'. Yuyo being a Quechua word that apparently means 'tender

It has been recorded since 1586.
edible herb'. In San Cristóbal Lowy found that the fly-agaric is commonly still called by natives yuyo de rayo. These names raise the question whether A. muscaria, when yuyo originally came to be used for the fly-agaric, was not considered by the natives as edible: we hope that this question will catch the attention of linguists.

The famous mushroom stones of the Mayan archeological world seldom resemble the numerous species of Psilocybe that are much sought after throughout Oaxaca and thereabouts, but they present, most of them, good profiles of A. muscaria, and this supports the linguistic evidence that the Maya people used A. muscaria as their most holy entheogen.

Space

From the Popol Vuh we learn that there were three kinds of kakuljá in traditional belief:

First and foremost:	-- kakuljá huracán	-- one-leg[géd] lightningbolt
Second:	-- chipi kakuljá	-- dwarf lightningbolt
Third:	-- raxa kakuljá	-- green lightningbolt

Here is a simple example, the first passage in the Popol Vuh where the three are cited:

Quiche text	Edmonson Translation
R umal ri, u K'ux Kah,	Through him who is the Heart of Heaven,
Hu r Aqan u bi	1 Leg by name.
Ka Kulaha Hu r Aqan nabe	1 Leg Lightning is the first,
U kaab q'ut Ch'ipi Ka Kulaha,	And the second is Dwarf Lightning.
R ox chik Raxa Ka Kulaha	Third then is Green Lightning,
Chi'e q'u oxib ri, u K'ux Kah.	So that the three of them are the Heart of Heaven.

Ka Kulaha Hu r Aqan	in the Preconquest Popol Vuh becomes
Kakuljá Huracán	in contemporary Quiche and
Lightning 1 Leg[géd]	in English.

In the Popol Vuh the three kinds of kakuljá, making up a trinity, are jointly cited eight times but not repetitiously. Each citation is in a fresh context and is itself freshly composed. The eight citations in Edmonson are centered on lines 183, 235, 350,

1496, 1741, 2282, 4981, and 5187, each of these being several lines long. But special distinction is conferred on one of the three: huracán, first member of the trinity, being cited alone five times, in lines 506, 712, 1512-1524, 4016, and 8198.

There can be no question that huracán, the one-leggéd one, loomed large in Quiche and Tzutuhil minds, larger than the other two.

I now venture the belief that these uses do not mean lightning at all. They refer to entheogens, the secondary meaning. The 'one-legged lightning-bolt' means Amanita muscaria. The 'dwarf lightningbolt' means the various Psilocybe species, normally much smaller than the fly-agaric, by comparison dwarfs. The 'green lightningbolt' is the morning-glory and its seeds that are entheogens and possibly other entheogenic phanerogams. The priority that the fly-agaric enjoys would stem back (1) to its superior entheogenic virtue as viewed by the Quiche, which in turn is due in part (2) to its immense antiquity, in Asia, where it was known as the one-legged one in the Siberian forest belt and by the same figure in the Rig Veda.

I think we have in lines 8197-8268 of the Popol Vuh a clear case where the entheogen should be expected: the help of huracán alone is besought in this passage, A. muscaria standing on its single leg. At the same time, when we stop to think about it, what a compliment it was to pay to both the lightningbolt and the fly-agaric: the analogy of a parallel between them, (1) the powerful stroke of lightning with a terrifying clap of thunder, and (2) the all-powerful entheogen, brilliant, lovely in texture, touched with fire and light, red-spangled with white spots, brimful of latent power for the believer. What a disclosure we uncover here, a disclosure not hitherto suspected!

For four centuries, first the clergy, later linguists, have been compiling word-lists and dictionaries of Quiche. Dr. Robert M. Laughlin, Curator of Anthropology of the Smithsonian Institution, has discovered one such list that features cakolha as hongo ponsoñozo, 'poisonous mushroom', a word list copied in 1779 from an original now lost. Have the clergy, or some individuals among them, known

and the public?
the secret of the entheogen but withheld that meaning from the others/ What has been the history of the knowledge of the entheogen?

The Spanish missionaries reached the Quiche country and began proselytizing about 1540. An unidentified member of a noble Quiche family about 10 years later began to write out the Popol Vuh in the Latin letters that the clergy had taught him, and he finished the task in less than five years. Apart from being of lofty lineage, his identity is unknown. Strangely, the manuscript seems to have enjoyed little circulation during the next century and a half. Then the Rev. Francisco Ximenez O.P., who had mastered well the Quiche language, shortly after the turn of the 18th century was asked by his superiors to copy that Quiche manuscript. He did so and the original manuscript was shortly afterwards returned to its home. It has never been seen since. It must have been lost or deliberately destroyed. Or does it possibly still exist, hidden in some conventual cupboard or Quiche secret place?

It is idle to speculate on the age of the Popol Vuh. That it goes back beyond the Conquest is obvious. A link between A. muscaria and lightningbolt existed among the Aryans with their Soma, just as it does among the Quiche, just as it does to this day among the Paleosiberian tribes, and also among the Ojibway around the Great Lakes. The presence of the entheogen hangs over the soul of the tribes in each of the four places. The entheogen has drawn no study from ~~sociologists and~~ anthropologists. Prof. John Brough of Cambridge University has warned me that I should not try to identify it. The Sanscritists have made no effort to find the Soma until I came along and with the essential help of Wendy Doniger O'Flaherty and certain friends identified it as A. muscaria. The professors of Greek like to deny that there was an entheogenic drink at Eleusis. They seriously pretend that the Greeks -- of all people! -- were content for a millennium and a half with a pantomime invoking a sheaf of barley or wheat! As for Mesoamerica, conventional scholars are still apt to call the entheogens 'narcotics' and ignore their place in the lives of the natives, even though sleep (= 'narcosis') is banned by the entheogen. How odd is this strange reticence of scholars, even the greatest of them!

It is true that no people, having developed a widely distributed method of writing, has for long used an entheogen. Our unlettered ancestors avoided speaking of the entheogen(s) directly, in plain language. They resorted to endless euphemisms, evasive terms, metaphors, gestures and words of a kind that one would expect to be pronounced in a whisper or a half-voice. The silence enjoined by the laws of Athens on the participants in the Mystery of Eleusis was an act of supererogation: the severe legal sanctions did not run beyond the limits of Athens, yet beyond those limits it was equally well observed, until B.C. 415, when the end of the Eleusinian sanctuary was approaching and there was in Athens the scandal of disclosure, with mock performances of the liturgy in private homes of the 'jet set', and trials that led to the conviction of Alcibiades. The silence about the entheogen until near the end was self-enforcing, whether in the Mesoamerican world, in the Indus Valley, at Eleusis, in the northern forest and tundra of Siberia and the Valley of the Ob, or among the Algonkians of North America.

THE FARLOW REFERENCE LIBRARY AND HERBARIUM
of CRYPTOGAMIC BOTANY, HARVARD UNIVERSITY
20 DIVINITY AVENUE · CAMBRIDGE · MASSACHUSETTS 02138 · U.S.A.
TEL. 617-495-2368

Dr. Bernard Lowy
Mycology Herbarium
Department of Botany
Louisiana State University
Baton Rouge, LA 70803

The Farlow Reference Library is in the process of cataloguing a publication written by you. We include complete names and years of birth of authors in our card catalogue to avoid any possible confusion about authorship. We lack the following data for you:

Full given names_____Birth year_____

At the same time, we are compiling a register of biographical information on cryptogamic botanists. For this purpose, we would be pleased if you would send us a recent curriculum vitae, or complete the following questionnaire. This information will be retained in our files for reference by scholars, subject to any restrictions you may specify.

Day_____, Month_____, Place_____of Birth

Subjects, Geographic Areas of Specialization_____

_____

Degrees Held (institution, year)_____

_____

Major Positions (institution, years)_____

_____

Location of Herbarium, Other Collections_____

_____

Major Publications (list may be attached)_____

_____

Sincerely,

Gerry Kaye

Geraldine C. Kaye, Librarian

— Thank you!

P.S. I don't think Meredith has a copy of the Publications list - would she like one?

Department of Botany
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803-1705
504/388-8485

14-VIII-1982

Dr. Richard Evans Schultes
Director, Botanical Museum
Harvard University
Oxfor Street
Cambridge, Massachusetts 02138

Dear Dick:

Yesterday I returned from Hungary and was most pleasantly surprised to find your letter inviting me to give a talk on some ethnomycologically related topic prior to the ceremony that will dedicate the Wasson Library in November.

You know in what high regard I hold Gordon's work, and I would be delighted to have the opportunity to make some pertinent remarks to a lay audience regarding Gordon's contributions to ethnomycology. During the first days of November I expect to return from meetings of the "1er Congreso Nacional de Micología" to be held in Xalapa, Mexico, where I have been invited to give an address on ethnomycology, so the tentative dates of November 13th or 14th seem fine.

A formal paper in the usual sense would certainly not be in order for a general audience, but to the two points that you make regarding the presentation, perhaps a third would be admissible: reference to Gordon's statute in the field of ethnomycology. Twenty minutes, more or less, should be sufficient for this. As to a title, perhaps something like "Ethnomycological Memorabilia" would be acceptable. I am open to suggestions, so let me know what you think about it.

With best regards,

Bernard

B. Lowy
Professor Emeritus

BOTANICAL MUSEUM • HARVARD UNIVERSITY • OXFORD STREET • CAMBRIDGE, MASSACHUSETTS 02138, U.S.A.

OFFICE OF THE DIRECTOR

August 5, 1982

Prof. Bernard Lowy
Botany Department
Lousiana State University
Baton Rouge, La. 70803

Dear Bernard:

The Wasson Library is now at the Botanical Museum. It will be dedicated at a formal ceremony on the evening of either Sunday November 13 or Monday November 14, 1982.

We hope to have, prior to the dedication, a meeting of those present with a 20-minute lecture by an outstanding mycologist. The title can be left to the speaker, but we would hope for two things: 1) that it be not too technical since many librarians, university officials and others not knowledgeable may be in attendance; and 2) that it deal in some way with ethnomycology.

The Library is to be called the Tina & Gordon Wasson Ethnomycological Collection.

Both Gordon and I would like to invite you to give this lecture, if you are free to come at that time. We will, of course, be happy to take care of your travel and living expenses here.

Sincerely yours,

Dick

Richard Evans Schultes, Ph.D.
Jeffrey Professor of Biology
Director, Botanical Museum

RES/kh

dates are wrong: 13th is Saturday.
I phoned Gordon Wasson on Wed. 18-VIII to discuss his ms.

SCHULTES, RICHARD EVANS, b Boston, Mass, Jan 12, 15; m 59; c 3. BOTANY. Educ: Harvard Univ, AB, 37, MA, 38, PhD(econ bot), 41. Hon Degrees: MH, Nat Univ Colombia, 53. Prof Exp: Collabr, Inst Biol, Nat Univ Mex, 38, 39 & 41; Nat Res Coun fel, Inst Natural Sci, Nat Univ Colombia, 41; hon res fel, Bot Mus, 41-54, curator, Ames Orchid Herbarium, 54-58, lectr econ bot, Univ, 58-70, exec dir, Bost Mus, 68-70, CURATOR ECON BOT, BOT MUS, HARVARD UNIV, 58-, PROF BIOL, UNIV & DIR, MUS, 70- Concurrent Pos: Rubber researcher, Rubber Develop Corp, Colombia, 42-43; jungle explor & botanist, USDA, 43-54, collabr, 54-55; collabr, Northern Inst Agr, Brazil, 46; Guggenheim fel, 50; ed, Bot Mus Leaflets Harvard Univ, 58- & Econ Bot, 63-; adj prof pharmacog, Sch Pharm, Univ Ill, 75- Mem: Nat Acad Sci; Col Acad Sci, Ecuador; Acad Sci, Argentina; fel Am Acad Arts & Sci; Linnean Soc. Res: Latin American ethnobotany, especially narcotics and poisons used by primitive peoples; orchid taxonomy; taxonomy of rubber plants. Mailing Add: Bot Mus Harvard Univ Oxford St Cambridge MA 02138

BOTANICAL MUSEUM • HARVARD UNIVERSITY • OXFORD STREET • CAMBRIDGE, MASSACHUSETTS 02138, U.S.A.

OFFICE OF THE DIRECTOR

August 5, 1982

Prof. Bernard Lowy
Botany Department
Lousiana State University
Baton Rouge, La. 70803

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Sincerely yours,

Dick

Richard Evans Schultes, Ph.D.
Jeffrey Professor of Biology
Director, Botanical Museum

RES/kh

Ethnomycological Collection To Be Dedicated at Museum

The dedication of the Tina and Gordon Wasson Ethnomycological Collection, the only ethnomycological facility in the world, will take place tomorrow at the Botanical Museum, home of the new library.

The donor, Dr. **R. Gordon Wasson**, former vice president of Morgan Guaranty Trust Company and his late wife Valentina, a pediatrician, studied the relationship between fungi and human affairs for more than 25 years. Their work, a shared avocation, established a new interdisciplinary science that has come to be known as ethnomycology, according to Professor **Richard E. Schultes**, Director of the Botanical Museum.

The Wasson Collection, which numbers more than 2,500 books and pamphlets in many languages and disciplines, will be presented to the Museum and its staff. The library and its collections will then be open to qualified students and research scholars under the direction of **Wesley Wong**, who also supervises the Oakes Ames Library of Economic Botany in the Museum.

At the dedication, Dean **Henry Rosovsky** (Faculty of Arts and Sciences) will thank Wasson on behalf of Harvard as will **Alan Erickson**, representing the science libraries of the University. Wasson will speak briefly of his extensive field studies since 1959, when he became an honorary research fellow of the Museum.

Other eminent scholars who have worked in related fields will pay tribute to the 84-year-old pioneer of the ritual uses of sacred mushrooms. **Wendy Doniger O'Flaherty**, Professor of the History of Religion and Indic Studies, School of Divinity, University of Chicago, a world authority on the Indic language, will speak as will Professor **Carl Ruck**, a world-renowned classical scholar, from Boston University, and Professor **Bertrand Lowy**, a botanist who has specialized in mycology, from the University of Louisiana.

Ritual Uses

Wasson, who has published seven books and 28 papers in learned journals about the mushrooms of Mexico, India, Japan, and other areas, has made many original contributions on the ritual uses of fungi, among them his identification of the enigmatic God-narcotic of ancient India, soma, as the fly argaric mushroom.

He has also suggested that the poorly understood Eleusinian mysteries of ancient Greece were due to intoxication with a fungus parasite on grain, ergot. Because of his work, Wasson has participated in numerous scientific symposia and has lectured widely on the religious uses of mushrooms.

Along with the library, Wasson has donated a large collection of art objects, mainly from Japan, devoted to mushrooms and a number of archaeological artifacts from Mexico and Guatemala concerned with the use of hallucinogenic mushrooms employed in native religious ceremonies.

Wilson Lecture

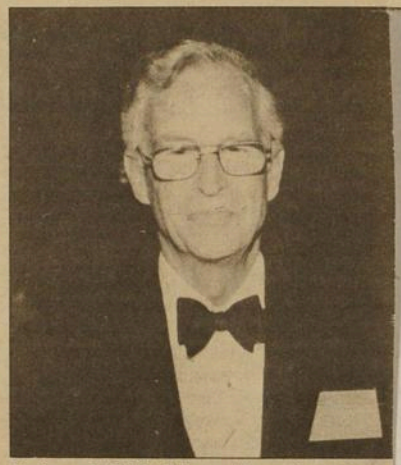
(Continued from page 1)

same whether the molecules are in the Pacific Ocean or in a teapot."

But when water is heated to boiling under extreme pressure (217 atmospheres), it reaches a critical point where the distinction between liquid and gas disappears. Instead of boiling, it develops wild fluctuations in density, forming droplets of liquid interspersed with bubbles of gas. These drops and bubbles vary so widely in size that the problem must be addressed on many different scales.

The renormalization group method breaks down a large problem (usually more complicated than this one) into a series of smaller steps. With each repetition of the calculations, the problem is addressed on a larger scale. Small fluctuations disappear, and the overall picture comes into focus.

The same approach could be applied to other critical phenomena: the onset of magnetization, superconductivity, or superfluidity; the properties of alloys and polymers; and the behavior of a mixture like oil and water at the temperature at which the liquids become fully mixed.



Professor E. Bright Wilson with son Kenneth.

The calculations revealed an underlying similarity among these diverse phenomena, uniting them in a single theory of phase transitions.

A high-energy physicist, Wilson is now applying the renormalization group method to describe the interaction of quarks, the elementary particles believed to make up the protons and neutrons of an atoms.

Households

(Continued from page 3)

tinct trends. While the number of adults becoming heads of households increased greatly between 1970 and 1975, the same category fell off sharply between 1975 and 1980. It is the latter trend on which Masnick bases his projections.

Masnick estimates that between 1980 and 1985 the number of young adults in the prime household formation ages [illegible] household growth.

After 1985, household growth in the 20- to 34-year-old groups will slow sharply as the "baby bust" generation replaces the "baby boom" generation, who will have already settled in homes.

The aging of the population was the key factor in 1970s housing trends, says Masnick, and in the next two decades will mean that increases in household rates will slow down. By the 1990s, the aging population will exert a negative

Harvard University Gazette

Inside

February 11, 1983 Vol. LXXVIII Number 23

B—
let's see what
happens!
Paul

HARVARD UNIVERSITY
JOHN F. KENNEDY SCHOOL OF GOVERNMENT
79 BOYLSTON STREET
CAMBRIDGE, MASSACHUSETTS 02138

18 Feb. 1983

TO WHOM IT MAY CONCERN:

In the Gazette of 11 Feb. 1983, the story on the dedication of the Wasson Library incorrectly identified one of the speakers, a close friend of mine. "Bertrand Lowy of the University of Louisiana" is, in fact, Bernard Lowy of Louisiana State University. Perhaps a short note to Lowy (% Dept. of Botany, Louisiana State University, Baton Rouge, La.) or a correction in the Gazette is in order.

Thank you for your attention.

PAUL ZIGMAN
(Sr. Research Asst. and Special Asst. to the Dean)

'Greenhouse effect' research wins scientist $150,000 prize

LOS ANGELES (AP) — A Swedish scientist won the $150,000 Tyler Prize for Environmental Achievement for helping focus international attention on how air pollutants are warming Earth's climate by creating a "greenhouse effect."

Bert Bolin, 62, director of Stockholm's International Meteorological Institute, will receive the money and a gold medallion Friday night in Los Angeles, the prize committee announced Thursday.

Committee spokesman Howard Stone said Bolin helped lay the groundwork in the 1940s and 1950s for modern computerized weather forecasting. But he was awarded the 1988 Tyler Prize for research done since the mid-1950s on the chemistry of Earth's atmosphere and the effects of pollutants, especially carbon dioxide produced by the burning of fossil fuels, Stone said.

Carbon dioxide, methane and certain other gases trap heat in Earth's atmosphere, much like glass traps heat in a greenhouse. Scientists say this "greenhouse effect" will warm Earth's atmosphere significantly during the next century, possibly causing sea levels to rise and triggering droughts, crop failures and other environmental damage.

Research by Bolin, who also is a meteorology professor at the University of Stockholm and science adviser to Sweden's prime minister, "is of fundamental scientific importance," the prize committee said.

The annual Tyler Prize, administered by the University of Southern California, was established in 1973 by outdoor enthusiasts Alice C. Tyler and her husband, the late John C. Tyler, founder of Farmers Insurance Group.

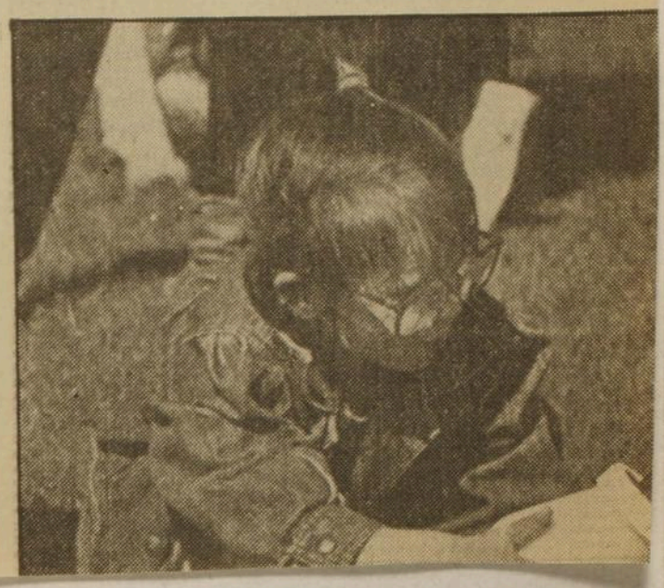
13-V-'88

Attorneys on both sides agreed Thursday to a plan that could bring an end to the longest-running school desegregation case in the country if approved by the local School Board and a federal judge.

The School Board was scheduled to meet at 8 a.m. Friday to review modifications drawn up by attorneys for the School Board, NAACP and U.S. Justice Department. Board members special meeting.

If approved by the bo be sent immediately to attorney John Ward sa

Ward said Gail Ray, local chapter of Association for the A Colored People, and F attorney for the Department, agree modifications of the sch desegregation plan.



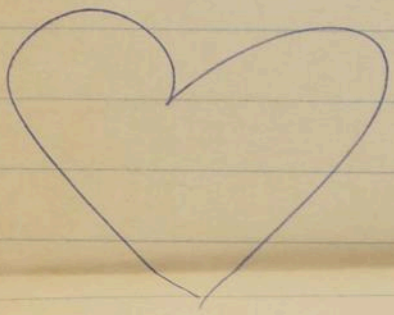
December 20, 1987

Dear Papi,

I think you'll enjoy reading this article about your pal Schultes. Let me know what you think!

Muchos besos -

Doris



The plant man

RICHARD SCHULTES: The life and times of a gentleman and a scholar

BY DON LESSEM

On a January morning nearly 41 years ago, Richard Evans Schultes, a Boston botanist, lay in his hammock beside the Rio Negro, deep in the Colombian jungle. He made the following brief entry in his journal:

"The launch did not return today, so we had no warm food again this evening. As always when I do not feel well, I am terribly homesick. I really wish something would open up for me in New England."

Lest these lines smack of carping, consider that the morning he penned these uncharacteristically personal words in characteristically meticulous script, the botanist was racked with malarial fever and rheumatic pain in every limb, vomiting blood and bile. The dilapidated 30-foot-by-12-foot barge that had carried him, 14 Indians, and a dog to this mosquito-ridden backwater had cracked up on a tree. The botanist, never one to pass up a specimen, took a cutting from the tree. Then, as he often found himself at least figuratively in that decade, Schultes was up the creek without a paddle.

Eight years later, long after Schultes had regained his vigor and enthusiasm for his life in the wild, something did open up for him in New England: Biology 104. Plants and Human Affairs. An undergraduate introduction to economic botany — the application of plants to human needs — it can be found in any Harvard College course catalog of this century. Taught annually at Harvard for more than a century, it was until this year the oldest science course continually taught at the university, perhaps in the world.

Only three men had taught Biology 104 when Dick Schultes returned from 13 years of exploring the Amazon jungle in 1954 to take on the job. Only four men had ever taught it when professor Schultes — the world's most honored man in his field, ethnobotany — retired at 70, two years ago.

PROFESSOR OAKES AMES WAS TEACHING BIOLOGY 104 IN 1935 WHEN Schultes, a burly young premed student from Boston, took the course. Ames was a tall patrician, Harvard to the core (much like his grandson George Plimpton), and not without his grandson's maverick streak (Ames and his *Continued on page 29*

Perched on a cliff in the Colombian rain forest, Schultes collects samples of a then-unknown member of the gloxinia family.

Inset: Schultes, canoeing in the Amazon, examines the flower of *Victoria regia*, the world's largest water lily.

DON LESSEM IS A KNIGHT FELLOW IN SCIENCE JOURNALISM AT MIT AND A FREQUENT CONTRIBUTOR TO THE *GLOBE*. HIS ARTICLE ABOUT MUSIC BOXES APPEARED IN THE DECEMBER 6 *GLOBE MAGAZINE*.

efforts are making the greatest public name for ethnobotany. Schultes reassured Davis during his own moments of career doubt with the same letters Ames had sent him four decades before. And he sent Davis in his own stead to Haiti in 1982, at the behest of a New York psychiatrist, to study the chemical composition of voodoo witch doctors' "zombie" powder. Davis found the powder and in it a fish poison capable of producing a genuine limbo state. Last year Davis turned his Haitian research into a thesis Schultes calls "masterful" and a controversial popular book (*The Serpent and the Rainbow*). Sometime in 1988, the book will become a motion picture.

At 33, Davis is rich, famous, and hugely indebted to Schultes. He marvels at his own fortune: "I've got the whole world open to me now, and it is all because of Schultes. He taught me how to write, he dropped everything to help all of us. He's been a second father to me." Davis is planning, following a book on an ethnobotanical exploration of his own that he made in the Amazon this year, a biography of Schultes. "That will be my present to him."

Schultes has neither the inclination nor the time to take on his own past. He has four books in the works now. He's gathered 125 of his finest Amazonian photographs, grouped them by themes (rivers, plants, etc.) and matched them to apposite quotes by explorers, Spruce chief among them. Synergistic Press will publish the collection in March as *Where the Gods Reign: Plants and People of the Northwest Amazon*. After 11 years of part-time effort, Schultes is also nearing completion of his translation of the diary of a Spanish botanist who explored Chile and Peru in the 1700s. He intends to put together a textbook of economic botany "if I live long enough."

But the biggest mountain still to climb is made of a mound of spiral notebooks in Schultes' offices. They contain descriptive notes of thousands of plants collected by Schultes, many seen by no botanist before or since, few recognized by any but Schultes and native witch doctors for their medicinal effects.

Schultes has long postponed the final consolidation and indexing of these notes, matching them with Raffauf's assistance to what is known about their chemistry. "I've told him candidly that a book of useful plants of the Amazon would be his greatest accomplishment," says Plowman.

This past summer Schultes and Raffauf began working full time on the project. But even if Schultes lives to his 90s, he concedes, "there just isn't enough time" to pass on all that he has learned.

Still, he could take comfort, if he ever were so inclined, from the knowledge that his memory, his quest, will endure in the next generation. And his course. No one could be found on the present Harvard faculty to teach Biology 104 this coming semester. But on a November morning the new chairman of the Harvard biology department, E. O. Wilson, made a notation on his yellow work pad for an upcoming faculty meeting. "We must find a person to teach economic botany next year," Wilson says. "It is one of our highest priorities."

Proof once again, as Ames wrote Schultes, that "if you tend your crucible with an open mind and faith in your venture, you may one day find yourself among those who have triumphed." •

baria and overseer of all university botanical institutions, including the Botanical Museum. "The Botanical Museum is still a vigorous research, collecting, and teaching institution."

But other ethnobotanists are not so charitable. "The museum has been dismantled and will probably die," says a former Schultes protege, Timothy Plowman, chairman of the botany department at Chicago's Field Museum of Natural History. Davis concurs: "Harvard's destroyed the Botanical Museum as an institution, allowed ethnobotany to die." With it nearly went both Schultes and Biology 104.

Two years ago, Schultes reached mandatory retirement age. The professor who was to take on Biology 104 was called away for research, and no one could be found to fill in. After 111 years of continuous instruction, Biology 104 was shelved. It missed one annual beat but was resuscitated the following year. "The course wasn't going to be taught, so I thought I ought to try," recalls professor Richard Howard, a Harvard botanist, himself near retirement, who stepped in to teach it last year. Where once the course had drawn 75 students, only nine registered, though 25 more, including several faculty members, audited. Schultes guest-lectured. "He gave two of his superb talks, on narcotics and alcoholic beverages," Howard says. "After the course I handed out evaluation forms, and many of the students said Schultes should teach the course forever."

Were it not for Harvard's retirement rules, Schultes might very well do so through this century, as he is a robust descendant of nonogenarians on both sides of his family. But this time last year it looked as if he might not survive another semester. Complications set in following gallbladder surgery, and Schultes was hospitalized for 43 days, slowed for months thereafter. For the first time since he left the Amazon he had to forsake his annual return visit this year. Davis blames the devaluation of his field for Schultes' slow return to health. "I think it was just too painful for him to see what was being done to the Botanical Museum." Plowman adds, "It's very disheartening to see the rug pulled out from under you."

Indeed, as Schultes sits in his office, sorting his papers, two young student employees of the buildings department come to measure his office, for yet another inventory of museum space, perhaps to form the basis for yet another round of cannibalizing Schultes' realm. Schultes, looking pained, questions them at length before leaving them to their task.

Schultes is not presiding over a moribund empire. If his inattention to administrative detail helped sow the seeds of destruction of his discipline at Harvard, his close attention to his students has helped ethnobotany sprout with new vigor throughout the world.

Schultes' pupils, and their achievements, are legion. Dr. Andrew Weil, a former Schultes student, has written four popular books and is an authority on alternative medicine and psychedelic drugs. Timothy Johns, of the University of Michigan faculty, won a national award for the best PhD thesis for his study of the domestication of the potato. His fellow Schultes-educated Michigan colleague, Richard Ford, is an authority in archaeological applications of ethnobotany. Plowman, perhaps Schultes' most brilliant student, is the world's leading botanical authority on cocaine.

Other Schultes-trained botanists are to be found from Mexico to Europe. And many work in concert in new worldwide efforts to expand the reach of ethnobotany. Mark Plotkin, an apprentice though not a graduate student of Schultes, has been appointed to head a new plant-preservation program for the World Wildlife Fund-US.

Balick helped form the Institute of Economic Botany at the New York Botanical Garden in 1980, now home to 20 full- and part-time researchers, Davis included, who roam the world collecting plants and the botanical wisdom of other cultures. The National Cancer Institute has awarded the institution $627,000 for a five-year program to gather 7,500 plants from South American rain forests. A like amount has gone for the study of African plants by the Missouri Botanical Garden staff, and an even larger grant for studies in the Asian tropics will be overseen by another Schultes protege, Doel Soejarto of the University of Illinois at Chicago. "The fact that he has so many advocates in the field is a tribute to him," says Davis.

But it is Wade Davis whose

1950, two years after retiring from Harvard. But with the assent of Paul Mangelsdorf, Ames' successor as Biology 104 professor and Botanical Museum curator, Schultes was able to stay on four more years in the field. Then, suddenly, in 1954, as Schultes recalls, "the jig was up." He had exceeded by six years the university's limitation on unpaid appointments. A university administrator discovered the violation, so Mangelsdorf wrote Schultes to offer a way out — a paid appointment as curator of economic botany. His blood still running true crimson, Schultes found the decision between staying with the USDA and going back to his alma mater "wasn't hard for a Harvard man."

Back to Harvard for Schultes meant back to the future. Schultes found himself watching his watch, battling "the tension we're under, the pressure of appointments which hung over me like a sword of Damocles." In his absence, parking meters had surrounded his Harvard domain. To this day he has refused to feed them. (As he is a man of principle, not a scofflaw, Schultes searches out nonmetered parking for his Jeep. He boasts he's never received a parking ticket.)

Schultes courted and married Dorothy McNeil, an opera singer he'd heard perform at church years earlier. Explaining their happy, argument-free marriage, he proudly states, "We have nothing in common." She's a liberal. He is so far right of any known party that he has written in Queen Elizabeth's name on his last two presidential election ballots. They swiftly began a family — first a son (now businessman Richard Evans Schultes II), then twins (now geneticist Neil Parker Schultes and physician Alexandra *Ames* Schultes) — and settled into a comfortable suburban life in Melrose.

At Harvard, Schultes was much the sort of professor Ames was and would have wanted his protege to be, if not a man "going places." Like Ames, Schultes was an inspirational teacher. "He's such a resonant authority on his subject that he is a very entertaining lecturer," says Wilson. Schultes planted a love of ethnobotany in his students and nurtured it financially as well as intellectually (without Ames' private means, Schultes proved an adept grant-winner).

Courtesy of Richard Evans Schultes

Schultes and a Makuna Indian share tobacco snuff in Colombia.

Schultes taught, wrote, and sought to organize his and others' collections, like many a cloistered academic. Yet once or twice a year he'd return to his second home, the rain forest. There, as at Harvard, he was the same unassuming man: "The jungle never changed me," he states unequivocally. But it changed how others looked upon him. In the 1950s he was seen as bold survivor of the "Green Hell," an Amazon filled with cannibals and killer anacondas. "Harvard Botanist Never Wore Side Arms" read the headline of a 1959 newspaper feature. In the late 1960s and early '70s he became an unwilling guru for hallucinogen-happy would-be mystics who sought his wisdom on peyote and LSD. Schultes co-wrote two books on the latter drug but took umbrage at its chief advocate, Timothy Leary, then a fellow Harvard professor, for calling LSD a *psychedelic* drug, when *psychodelic* would have been better Greek. Schultes also disdained thrill-seeking hallucinogen use, though he does admit to some disappointment at never having seen any more than flashes of light "when colleagues report seeing beautiful cities, golden cars, that sort of thing."

For the past decade or more, Schultes has had to fight for recognition of his discipline against the ascendant science of microbiology, the high-tech, high budget, high-visibility world of genetic engineering. He needed the attention not for himself but for funds, for graduate students, for collection space.

Even in a genetically engineered world, it is essential that we gather the greatest stock of genetic variation, which must be drawn from species before they disappear from the earth. Drug companies had backed ethnobotanical searches after the "miracle drug" discoveries of the '60s, including the Madagascar periwinkle, a tropical plant that proved an 85 percent guaranteed cure for once-lethal childhood leukemia. But without follow-up successes since, they have withdrawn much of their financial support.

No man could have reversed the broad trend away from old-fashioned organismic biology, but Schultes, much like Ames, "lacked a taste for administrative battling," as Wilson puts it. As curator of economic botany and director of the Harvard Botanical Museum, Schultes disdained the posturing and politicking that win status and security. "Schultes is not a politician. He doesn't play political games. Consequently, he didn't lay the best foundation for continuation of his activities at Harvard," says ex-student Michael Balick, an assistant director of the New York Botanical Garden. Much arm-twisting was called for because, as Wilson explains, "there are many professors here who haven't the slightest idea what ethnobotany is."

The Botanical Museum, one of but five botanical institutions within the university, saw its collection space taken away in favor of administration and other sciences. Schultes, ever loyal to his alma mater, minimizes the downturn of his department and the university's role in its decline. "I'm happy with most of the changes here. 'Every tub on its bottom' is the motto here. Each department must get its own money." Donald Pfister agrees. He's director of the Harvard University Her-

hardened criminals? He was told to wear a gun at all times."

Former student, now author and ethnobotanist, Wade Davis is just as incredulous. "Didn't he tell you about waiting weeks for an airplane to fly him and his specimens out, then giving up his seat to a sick nun, thinking it more important to send the specimens? The plane crashed, and everyone aboard was killed."

Davis' favorite Schultes saga is what he calls an "extraordinary feat of endurance." After mistaking a numbness in his fingers that marked developing beriberi for the effects of the formaldehyde used to preserve species, Schultes battled spreading paralysis in his extremities and everworsening fatigue in paddling 40 days to reach a doctor.

Our man in the Amazon when World War II broke out, Schultes was assigned by the US government the crucial task of shipping north a supply of natural rubber, essential for airplane tires. The rubber industry had long since departed for Malaya, leaving bitter memories among disfigured Indian survivors of the torturing, murdering ways of Peruvian rubber-procuring companies. Schultes acknowledges he met Indians "without ears, fingers" on the Putumayo, "The River of Death" upon which the latex moved. But he notes, "I had no problems working with them." Says Davis, "It was very dangerous work. Schultes was the first to go there after Pearl Harbor, 30 years after terrible atrocities. And yet he persuaded the Indians to work for him."

Schultes' stamina shows through, even in his self-deprecating diaries. One, from his journey on the Rio Negro in Brazil, chosen at random out of his desk, reveals his nature as well as nature itself. Between the carefully numbered and described collections, the landmarks duly noted, are brief notations of Schultes' malarial agony. On these waters, of which Spruce wrote, "I never saw such a deserted region," Schultes, like Wallace and Spruce before him, took deathly ill.

Yet Schultes dismissed the disease-bearers — "The hungry mosquitos, which bit right through the hammocks, made the rest of the night a delight, indeed" — in much the same way as Spruce had written of them: "My hands, neck, and feet are painted with their bites. To be exposed to such as this is no bagatelle." The greatest disappointment of Schultes' Brazilian journey was spoilage of his specimens due to inferior formaldehyde: "I was never so downhearted." His greatest joy was the rediscovery of *Micrandra siphonioides*, a 100-foot-high specimen of a great rubber tree that Spruce had identified a century before.

Single, self-sufficient, engrossed in work that could easily consume a lifetime, Schultes was, when in good health, largely content to remain in the Amazon. Employed by the US Department of Agriculture to search for new rubber-producing species, he kept up his plant-collecting as an honorary Harvard Botanical Museum staffer. And in the moments of questioning the import of his work, he was comforted by Ames, with whom he corresponded often. "I am not interested in training future teachers," Ames wrote. "My interest is in men who are 'going places' in the big world of intellectual effort." And "if you tend your crucible with an open mind with faith in your venture, you may one day find yourself among those who have triumphed."

Schultes lost his guide when Ames died in

Photographs courtesy of Richard Evans Schultes

weekdays for three decades. Around him in this narrow room directly above the "Glass Flowers" exhibit of Harvard's Botanical Museum (an exhibit Ames put in evolutionary order) are arrayed materials that reflect this curiously mixed life of cloistered academic and jungle explorer. A half-century's thick volumes of *Chemical Abstracts* line one bank of shelves. Specimens — dried, labeled, mounted — fill the cabinets along another wall. The desk drawers are jammed with Schultes' travel diaries, the walls adorned with a large relief map of the Amazon and Schultes' lush black-and-white photos of Indians in the rain forest. Spiral notebooks full of Schultes' descriptions of plants and their medicinal uses compete for desk space with abstracts of his own papers, copies of which have spread beyond the office into the hall beyond.

For Schultes, reflection is a distraction from the task at hand — reordering his papers. The time for exploration is long past. The time has come for putting things in order.

Much has changed in the world, in the wilderness, and in the realm of ethnobotany since Spruce, and for that matter Schultes, worked the Amazon. Yet, a century apart, they may well have touched the very same trees, a communion made possible not only by the long-lived trees of the virgin forest, but by the meticulous record-keeping of Spruce as well. Following Spruce's notes, Schultes found, "I'd read, 'I came on a rock in the river shaped like a sitting frog. I tied up the canoe, walked NNW 150 paces to white sand, and saw this tree.' Sure enough, the tree was there," Schultes marvels.

Schultes, like Spruce, was sustained in his arduous travels by his consuming interest in his work. Spruce wrote, "I look upon plants as sentient beings, which live and enjoy their lives." Schultes also admits to "the deepest love for plants. They are my profession and my hobby."

Even when traveling in Spruce's footsteps, Schultes was very much on his own in the jungle. His own resolve was considerable, buoyed by "an inner calm" that colleague Wilson envies: "Much as I love the rain forest, I could never stay out more than three months." Yet Schultes returned to "civilization" but every two years and then only for two months.

Schultes would argue, however, that he never made it on his own in the jungle. Traveling by seaplane, on horseback, on foot, and principally by canoe, Schultes placed his trust in the preliterate Indian peoples. They treated their first Caucasian visitor with awed curiosity, generosity, and, in time, enduring loyalty. As gifted at languages as he is poor in mathematics ("I can't add a cipher"), Schultes learned the region's two mother tongues, Witoto and Makuna, well enough to communicate in most of the nearly 50 regional languages.

Schultes shared the natives' food (a starchy diet heavy on tapioca and manioc), slept in their vast communal long houses, sampled their hallucinogens (though in more modest dosages), and danced in their ceremonies. And Schultes was careful to document their ways as unobtrusively as possible. He learned to shoot his Rolleiflex while standing at right angles to his subjects. Not that the results would have meant anything to his unsuspecting targets. "A one-dimensional image is meaningless to them. Show them a picture, they see only patches of colors," says Schultes.

Schultes scrupulously refrained from imposing Western values and culture on the people who were at once his study subjects, his friends, and his hosts. He relaxed that posture only once, when he came upon a small girl dying of a venomous snake bite. He gave her his antivenom serum but cautioned, "My medicine may not work for you." He insisted a witch doctor first perform "his mumbo jumbo, blowing tobacco smoke on the wound," so the shaman might, as he did, take credit for the girl's swift recovery.

While Schultes will talk willingly, at length, of the still unexploited pharmacological potential of the Amazon, his personal accounts are not so freely shared. "I didn't have *adventures*," he says, spitting out a word that to him smacks of poor preparation and unscientific thrill-seeking.

"He said he had no adventures. Unbelievable!" Wilson chuckles. Like Schultes' other close colleagues and students, Wilson knows differently. "He didn't tell you about the time he was sent to a part of the rain forest that was like a Devil's Island for

The plant man

CONTINUED FROM PAGE 18

students made hooch in his laboratories during Prohibition).

Schultes loved Ames' course, "a practical introduction to useful and harmful plants," as he unromantically remembers it. Young Schultes was predisposed toward botany, having collected plants around the Townsend home of his uncle since childhood. Still, Ames cultivated Schultes as carefully as the orchids upon which he earned his world-renowned authority.

Schultes' driving academic interest became ethnobotany, a centuries-old but little-known practice of studying plant uses among "primitive" tribal peoples. Within that esoteric specialty, Schultes developed a particular interest in the uses of hallucinogens in many New World societies and their potential as a source of new medicines. Under Ames, Schultes became one of the university's many loyal "Ibid Boys," completing his bachelor's, master's, and doctoral degrees at Harvard.

But to earn degrees or make a living in economic botany, Schultes had to go well beyond the ivied walls of Harvard's Botanical Museum. Ames sent Schultes to the Midwest to do his undergraduate honors thesis on use of the hallucinogen peyote by Oklahoma Indians, and he found funding for Schultes to travel to Mexico for his doctoral studies of plant use by the Mazatec Indians. "I have a feeling he paid for it out of his own pocket," says Schultes.

Ames' motivation? "It was hard to get PhDs," explains the self-effacing Schultes.

Schultes set off for the Colombian Amazon in 1941 on a year's National Research Council grant to survey arrow poisons of the remote region (one of them, curare, is the source of an important surgical anesthetic). In the year that stretched to 13, Schultes rewarded Ames' faith and philanthropy many times over, and in ways particularly close to his mentor's heart. His first day in Bogota, before he even unpacked his gear, Schultes found a previously undescribed species of orchid at the end of the trolley line. (He stuffed a few specimens into his passport for later pressing.) And after years of searching, he rediscovered the New World's only blue orchid, a much-prized specimen previously noted in the wild by only three Western travelers.

But Schultes was after much more than curare and orchids. The Colombian jungle, in desperate need of inventory, was but one overflowing aisle of the greatest drugstore on earth — the tropical rain forests. From these lands come morphine, codeine, quinine, and at least a third of all modern medicines.

The urgency of gathering useful plants from the western Amazon was, and remains, not the imminent loss of the species but of the native pharmacists themselves. Even now as other parts of the rich Amazon flora are lost, eradicated by expanding agrarian populations at a rate of two Switzerlands' worth of land a year, the headwaters of the Amazon remain carpeted with much the same dense virgin forest they have known for millennia. Treacherous rapids and steep slopes isolate the land from all but the few small tribes that know the forest well. Without the aid of these scattered, dwindling Indian tribes and the plant knowledge they've acquired over thousands of years, there are far too many plant species to gather or to screen for medicinal value. The jungles of western Amazonia are host to some 80,000 species of flowering plants. A botanist would be hard-pressed to find more than 1,900 in all of New England.

Into much of this remote wilderness only one scientist, one non-native, had ever gone before Richard Schultes: Richard Spruce, a 19th-century Yorkshire, England, schoolteacher. If Oakes Ames was Schultes' angel, Spruce was his god, "Dick modeled his life after Spruce," says Schultes' collaborator and occasional Amazon traveling companion, Robert Raffauf, pharmacognosy professor emeritus at Northeastern University.

At first glance, Spruce would seem an unlikely choice for botanical explorer par excellence. But only slightly more unlikely than Schultes, a baked-bean-eating Harvard Tory. His wire-

rimmed glasses aside, the beefy, ruddy Schultes never bore much resemblance to Spruce — a lean, dark, and diagnosed tubercular man. But the dissimilarities were only skin deep.

Spruce was far more robust than his appearance or his doctors' diagnoses suggested. He endured more than 15 years in South America (1849 to 1865), roaming from Brazil to Peru collecting thousands of plants previously unknown to science. He gained the first botanical knowledge of eight species of *Hevea*, the source of natural rubber. He made a special study of narcotics and stimulants in eastern Peru, sampling native drugs and participating in their rituals. In meticulous script he kept notes that his more famous contemporary biologist Alfred Russel Wallace edited and called "among the most interesting and instructive books of travel of the 19th century." Wrote Wallace, "Everything is to be found in Spruce and the temptation to quote him is irresistible."

In a 1980 introduction to Spruce's *Notes of a Botanist on the Amazon and the Andes* (first published in 1908, 15 years after Spruce's death), Schultes wrote of his hero: "Spruce never could have written a book about Spruce — he was too self-effacing and humble. . . . He 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."

The same might be said of Schultes. And indeed it has. "In an institution filled with large egos, Dick Schultes has none," says an admiring E. O. Wilson, fellow encyclopedic Harvard biologist. "Yet after a lifetime of careful study, his scientific and practical knowledge is almost limitless." Unlike Spruce, who died little-recognized for his accomplishments, Schultes is a living legend in botany.

Schultes prefers to stress what remains for him and others to do, and to disown those accomplishments falsely attributed to him. He points out that none of the plants of native medicinal use he has brought back has been put to commercial use. "I'm not the 'father of ethnobotany' nor even the discoverer of arrow poisons, as some would have it," he says. "Ethnobotany has been around since the Pharaohs — we have scrolls of theirs with formulas for medicines. I'm not quite that old. And Sir Walter Raleigh, not me, found arrow poisons in South America — in the 1500s."

What Schultes has done is to author scores of elegantly written papers (in English, Latin, and Spanish) and several books on matters from *Hevea* to hallucinogens. These and his championing of rain forest preservation have won him many awards — most recently a $75,000 Tyler Prize for Environmental Achievement. Other honors include a World Wildlife Fund Gold Medal and decoration for Amazon research by the Colombian government. Named for him is a 2.3 million-acre tract of Amazon preserve, as well as several groups of orchids and other plants (including one tenacious rain forest cliff-hanging plant in the gloxinia family, *Resia*, named for his initials), and even a 4-inch cockroach.

As he looks back on his years in the forest, Schultes looks out his office window at the well-manicured greenery of Harvard Yard. He's donned tie and white lab coat as he has done