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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.

Pierfelice Ravenna - Chile
Iridaceae (Guano)
'78

Gerardo Budowski - Costa Rica
(Turmalina)

Rutger Research Center - Manager
Microcyclus ulei

Tari + Agro - Florestal - Anape

Paulo de T. Alvim - Bahia, Brazil
(Boris Skvortsov)

Boscett Maguire { Post grad course
Chilean Province { in Botany
INPA

Angel Cabrera - Inst. Darwinian
B.A.

Kent Dumont - NYBC

Patricia Holmgren - "

Frances Maroncelli - "

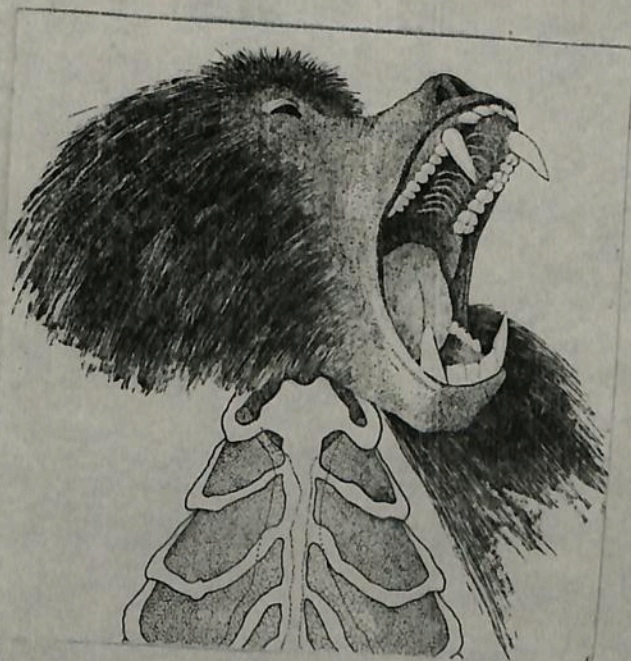
Clark Rogerson - "

Wm Steere - "

Howard Drwin - "
(Portuguese at Columbia)

John Mickel - "
(Ferns)

Julian A. Steyermark - Caracas, V.



59-62



AMAZONIAN INDIANS
APPROXIMATE LOCATIONS OF SOME TRIBAL GROUPS

KEY _____

TABLE I

Amazonian data sheet

Topic	Region	Data	Units	Reference
<u>Area</u>	<u>Brazil</u>	<u>8 511 965</u>	<u>km²</u>	Rebello, 1973
Area	Amazonia	5 057 490	km ²	Rebello, 1973
Area	Northeast	1 262 925	km ²	Rebello, 1973
Area, proportion of Brazil	Amazonia	59	%	Resende, 1973
Area, proportion of Brazil	Northeast	15	%	Resende, 1973
Population, mid 1973 (est.)	Brazil	101 300 000	inhabitants	Pop. Ref. Bureau, inc.
<u>Population 1970</u>	<u>Amazonia</u>	<u>7 561 000</u>	<u>inhabitants</u>	Rebello, 1973
Population 1970	Northeast	23 627 000	inhabitants	Rebello, 1973
Population, proportion of Brazil	Amazonia	8	%	Resende, 1973
Population, proportion of Brazil	Northeast	25	%	Rebello, 1973
Population, growth rate	Amazonia	3.5	% p.a.	
Population density	Amazonia	1.4	km ⁻²	Rebello, 1973
Population density	Northeast	20	km ⁻²	Rebello, 1973
Income, proportion of Brazil	Amazonia	4	%	Resende, 1973
Porportion of Brazil	Northeast	13	%	Resende, 1973
1960	Northeast	80	US \$ p.a.	Rebello, 1973
1970	Northeast	207	US \$ p.a.	Rebello, 1973
<u>River length</u>	<u>Amazon</u>	<u>6 740</u>	<u>km</u>	<u>Schreider and Schreider, 1970</u>
River volume	Amazon	160 000—200 000	m ³ /sec	Rebello, 1973
River length	Nile	6 660	km	
River length	Mississippi	6 000	km	
	(total)			
River length	Madeira	3 380	km	
River length	Juruá	3 283	km	
River length	Purus	3 220	km	
Watershed area	Amazon (total)	7 000 000	km ²	Rebello, 1973
Watershed area	Amazon (in Brazil)	4 700 000	km ²	Rebello, 1973
<u>Tributaries, number</u>	<u>Amazon</u>	<u>1 100</u>		Rebello, 1973
Navigable waterways	Amazon	80 000	km	Rebello, 1973
<u>Overall drop in height</u>	<u>Amazon</u>	<u>2</u>	<u>cm/km</u>	Rebello, 1973
Border length	Atlantic	1 480	km	Rebello, 1973
Frontier length	Terrestrial	12 320	km	Rebello, 1973
<u>Roads</u>				
total, 1960	Brazil	1 510	km	Resende, 1973
asphalt, 1960	Brazil	262	km	Resende, 1973
total, 1974	Brazil	8 600	km	Resende, 1973
asphalt, 1974	Brazil	2 000	km	Resende, 1973

hope that our warnings may prevent the fulfillment of our admittedly dire prognostications. If remediation is long in coming a major resource will be lost. We were urged to prepare this study by the surprising and regrettable realization that nothing remotely similar had been attempted, that knowledge of the highway construction program is poor, and that environmental warnings were muted and scarce.

The field reconnaissance was carried out during 3 months of an intensive, field-oriented course of tropical ecology we organized at the invitation of INPA, Manaus. The environmental ramifications of the highways were studied by the participants as the "applied ecology" half of the course.

Elsevier Sci. Publ. Co. 22

15499.

TABLE XXV

Vegetation types of Amazonia (after J.M. Pires, 1973)

Vegetation type	Area (km ²)
(1) Forest on terra firme (non-flooded)	3 303 000
(a) High forest with large biomass	3 048 000
(b) Liana forest of Tocantins and Xingu	100 000
(c) Low forest with reduced biomass	10 000
(d) Campina (or caatinga) forest	30 000
(e) Dry forest in transitional areas	15 000
(f) Other types of low sparse forest	100 000
(2) Várzea (periodically flooded) and igapó (swamp) forest	70 000
(a) Várzea	55 000
(b) Igapó	15 000
(3) Savanna on terra firme (non-flooded)	150 000
(a) Amapá	17 000
(b) Cachimbo-Cururú	15 000
(c) Madeira	5 000
(d) Roraima	41 000
(e) Trombetas-Parú	45 000
(f) Marajó	17 000
(g) Others	10 000
(4) Várzea savannas (flooded)	
(5) Low campina (including "caatingas of the Rio Negro")	
(6) Montane vegetation on fringes of Amazonia	
(7) Littoral vegetation (mangrove, etc.)	

must be borne in mind when planning preserves. If only a single tract of the Amazonian forest is preserved, then species which are not to be found in that area may well be eliminated. The dispersal of endemic species argues against the single large preserve which may be more effective in faunal protection.

Some of the vegetation types which are of more restricted occurrence than the wet forest are even more threatened by the road-building programs. An example of this is the campina which occurs on patches of white sand regosol soils within the forest. There are a number of species which are confined to campina vegetation. Most campinas occur on the north bank of the Rio Negro in the region of Manaus and many have already been irrevocably destroyed. This process of destruction progressed along the Manaus—Caracarai road, where a campina at km 20 was the first to disappear, quickly followed by one at km 28. Since these campinas are on pure white sand with virtually no soil nutrients (see IPEAAOC, 1971), the destroyed areas can serve no possible use for agriculture. At present their sole use is to provide sand for construction projects in the city of Manaus. The campina at km 62 of the same road would also have been destroyed if the Instituto Nacional de Pesquisas da Amazonia (INPA) had not been able to have it declared a federal reserve.

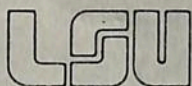
Transamazonian and other Amazonian highways, under PIN began, with massive environmental destruction soon spreading to the heart of Amazonia. Unemployment dwindled as commerce burgeoned, stimulated by the increased importation of consumer goods while construction and tourism boomed. Today population growth continues its acceleration; the heartland environment of Amazonia is menaced by a city rapidly approaching half a million human inhabitants and infected by highways along which agricultural settlement was officially promoted. In 1974, large agro-industrial enterprises particularly for extensive cattle ranching, started being promoted by the Ministry of Agriculture.

Chronology of events concerning Amazonia

- 1488 Captain Jean Cousin of Dieppe fabled to have reached mouth of Amazon.
1494 Treaty of Tordesillas divides South America into Spanish and Portuguese concessions.
1498 South America (at the Orinoco estuary) discovered by Christopher Columbus (1451-1506).
 1499-1500 Possibly as many as five expeditions reached equatorial South America.
1499 Amerigo Vespucci (1451?-1512) possibly discovers Amazon estuary after separating from the fleet of Alonso de Ojeda (1465?-1515).
 1500 In February, Vincente Yáñez Pinzón (1460?-1524?) sails into 'Mar Dulce', the Amazon estuary, declaring possession for Spain.
1500 In April, Pedro Álvares Cabral (1460?-1526) discovers Brazil.
1531-1532 Diogo Leite possibly navigates northeast coast of Brazil to the Amazon estuary, having parted from the expedition of Martim Afonso de Sousa (1500-1564).
1541-1542 Pizarro's lieutenant, Francisco de Orellana (1501-1550) descended the Amazon from the Andes to the ocean according to his Chaplain, Gaspar de Carvajal, in "Discoveries of the River of the Amazons".
 1549 Tomé de Sousa (1501-1573) founds Salvador, the first capital of Brazil.
 1560-1561 Lope de Aguirre (1508?-1561) finishes Pedro de Urzúa and Fernando de Guzman's expedition from the Andes down the Amazon, then possibly via the Rio Negro to the Orinoco.
 1570-1600 Establishment of settlements and Jesuit missions.
 1580 Portugal joins Spain under a single crown.
1615 Fort Presépio (now Belém) founded by Francisco Caldeira Castelo Branco and his 200 men.
 1619-1621 Roger North (1585?-1652?) explores Xingu and Tapajós Rivers.
1637-1639 Pedro Teixeira (1575?-1640) ascends the Amazon, exploring as far as Quito, then returns leaving a frontier marker at the Napo-Aguarico confluence, thus extending Brazil thousands of kilometers to the West.
 1640 Portugal separates from Spain.
1648-1651 Antônio Rapôso Tavares (1598-1658) travels overland from São Paulo, possibly via the Andes, returning to the Rio Madeira, then descends the Amazon.
1669 Francisco da Mota Falcão builds fort at São José do Rio Negro, which later becomes Manaus, among other forts established during this period.
1686-1724 Bohemian Jesuit missionary Samuel Fritz (1664?-1728) repeatedly traverses the entire river.

- 1722–1725 Alferes José Peixoto da Silva Braga travels overland from São Paulo via the Rio Araguaia and descends the Tocantins to Belém, abandoning the second Anhangüera expedition half way.
- 1726 Francisco Xavier de Moraes ascends Rio Negro to the Casiquiare Canal and reaches the Orinoco.
- 1736 French scientist, Charles Marie de La Condamine (1701–1774), exploring the Amazon, sends first sample of rubber to Europe.
- 1742? Manoel Felix de Lima of São Paulo crosses from the Sararé to the Guaporé River, eventually descending the Madeira to the Amazon.
- 1747 João de Souza de Azevedo descends the Tapajós from Mato Grosso; returns ascending the Madeira.
- 1750 Treaty of Madrid legalizes the Portuguese holdings west of the Tordesillas line by 'uti possidetis'.
- 1762 French botanist Fusée Aublet (1720–1778) names and classifies Hevea, the main rubber-producing tree of Amazonia.
- 1781–1786 Brazilian surveyor Astronomer Francisco José de Lacerda e Almeida (1750–1802) leads scientific expedition to Amazonia.
- 1783–1792 Governor Manuel da Gama Lobo d'Almada repelled Spanish settlers and expanded Manaus.
- 1799 Baron Alexander von Humboldt (1769–1859) proves the Amazon is linked by a natural canal (Casiquiare) to the Orinoco drainage.
- 1818–1820 Bavarian biologists K.F.P. von Martius (1794–1868) and J.B. von Spix (1781–1826) explore Amazonia.
- 1822 Independence of Brazil proclaimed by Emperor Dom Pedro I (1798–1834).
- 1823 Admiral J.P. Grenfell (1800–1869) brings Independence to Amazonia.
- 1825–1840 Cabanagem rebellion of Belém claims 40 000 lives.
- 1839 Charles Goodyear (1800–1860) develops 'vulcanization' process in the U.S.
- 1843 First steamship, the Guapiassu, of the Imperial fleet reaches Manaus in ten days from Belém.
- 1848–1852 British naturalist A.R. Wallace (1823–1913) studies in Amazonia.
- 1849–1855 British botanist R. Spruce (1817–1893) studies Amazonian flora. - 1864!
- 1850 The Province of Amazonas created; Manaus becomes its capital.
- 1853 Baron Mauá (1813–1889) establishes the first steamship line on the Amazon.
- 1866 Dom Pedro II (1825–1891) opens Amazon to international shipping. Over 200 U.S. Confederate sympathizers from Mobile settle in Santarém after the Civil War.
- 1873 Dr James Collins takes 200 rubber seeds to Kew, of which only 12 germinated and then died.
- 1876 Sir Henry Wickham (1846–1928) took seeds from near Santarém to Kew, leading to the establishment of rubber plantations in Ceylon and Malaya.
- 1887–1900 Severe droughts in the Northeast of Brazil provoke departure of 160 000 emigrants who start the 'rubber boom' in Acre.
- 1888 J.B. Dunlop (1840–1921) patents the pneumatic tire.
- 1896 Inauguration of the opulent Manaus Opera Palace.
- 1899 U.S. gunboat 'Wilmington' illegally penetrates Amazon up to Acre; Luis Gálvez Rodrigues de Arias proclaims the independent state of Acre.
- 1901 The Bolivian Syndicate of New York concedes rubber exploitation rights in Acre by Bolivia.
- 1902 Armed conflict between U.S., Bolivia and Brazil over rubber territory.
- 1903 Treaty of Petrópolis: Bolivia sells Acre Territory (191 000 km²) to Brazil for two million pounds sterling and minor concessions.
- 1910 Cândido Mariano da Silva Rondon (1865–1958) becomes first director of Brazil's Indian Protection Agency.

- 1912 Rubber production in Orient exceeds that of Brazil.
1913 Rondon guides Theodore Roosevelt (1858–1919) in Amazonia.
1914 End of quarter-century rubber boom (800 million kilos, 600 million pounds sterling); First World War declared.
1927 Henry Ford (1863–1947) establishes over a million hectares of rubber plantations in Fordlândia and Belterra; a complete fiasco by 1939.
1942 Brazil enters Second World War; Amazonia isolated for 2 years.
1953 SPVEA (Amazonia Economic Development Superintendency) established, with 3% of federal tax revenues applied to Amazonia.
1958 Belém—Brasília highway started.
1960 Capital of Brazil transferred from Rio to Brasília.
1964 Belém—Brasília highway passable throughout the year.
1966 SPVEA becomes SUDAM (Amazonia Development Superintendency).
1967 Manaus becomes a free port.
1970 The Transamazonian highway, Cuiabá—Santarém and PIN (National Integration Program) officially approved.
1972 Perimetral Norte highway included in PIN.
1972 Transamazônica between the Tocantins and Tapajós inaugurated.
1973 Perimetral Norte highway construction begins; estimated completion 1977.
1973 Brasília—Caracas highway (BV-8) proposal is approved by Brazil and Venezuela, estimated to be asphalted by 1976.
1973 Belém—Brasília highway completely asphalted.
1974 Transamazonian highway inaugurated; Cuiabá—Santarém and Cuiabá—Pôrto Velho—Manaus opened.



College of Arts and Sciences
Office of the Dean
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE · LOUISIANA · 70803
504/388-5922

July 23, 1980

Dr. Ghilleen T. Prance
Chairman, PSA
Vice-President, Director of Botanical Research
The New York Botanical Garden
Bronx, New York 10458

Dear Dr. Prance:

On behalf of the Department of Botany here at Louisiana State University I wish to establish whether or not the Botanical Garden will be able to provide herbarium specimens of fungi from the State of Acre in Brazil. For our permanent mycological collection we wish to acquire from 1,000 to 3,000 specimens (we realize that the specific number will vary tremendously with the conditions, geography, and other variables). In view of the recent history of mycological research at LSU, we would welcome a collection which emphasize members of the Tremellales (Basidiomycetes); however, we would also expect fungi of numerous other groups to be collected, including principally Ascomycetes and other Basidiomycetes (particularly the Aphyllophorales). It is my understanding that the Botanical Garden would be able to provide such a collection of mycological herbarium specimens eventually delivered to the department of Botany here at LSU and that such an accomodation of our research needs could be accomodated for a single payment of \$5,000. I would as I said welcome a confirmation of these possibilities from your office as soon as possible. On behalf of the Botanists here at LSU I extend best wishes for a complete success in this bi-national project and look forward to the possibility of adding to the LSU collections with materials from the Projecto Flora Amazonica.

Sincerely,

Russell L. Chapman
Associate Dean
Associate Professor of Botany

RLC/emc



The New York Botanical Garden

Bronx, New York 10458

(212) 220-XXXX
8628

July 25, 1980

Dr. Russell L. Chapman
Associate Dean
Louisiana State University
College of Arts & Sciences
Baton Rouge, Louisiana 70803

Dear Dr. Chapman:

This is to confirm that The New York Botanical Garden would be pleased to supply you with a set of Amazonian mycological collections from the States of Acre and Amazonas in Brazil.

I note that you are prepared to pay \$5,000 for this collection and confirm that these terms are acceptable.

The exact number of specimens will naturally depend on the number collected on the Projeto Flora Acre Expedition, but should be well over the minimum number of 1,000 mentioned in your letter. For your payment we will send you a full set of however many specimens are collected.

We are pleased that your department is collaborating with Projeto Flora Amazonica in this way.

Sincerely yours,

Ghilleen T. Prance
Chairman, Projeto Flora Amazonica

GTP/fm



THE
ASSOCIATION FOR TROPICAL BIOLOGY
INC.

Clifford Evans
Office of Secretary-Treasurer
c/o Anthropology—Mail Stop NHB-112
Smithsonian Institution, Washington, D.C. 20560

CIRCULAR TWO - September, 1978

THE FIFTH INTERNATIONAL SYMPOSIUM OF THE ASSOCIATION FOR TROPICAL BIOLOGY

Subject: The Biological Model of Diversification in the Tropics

Place: Tropical Hotel Manaus, Manaus, Amazonas, Brazil

Time: February 8th through 13th, 1979

* * * * *

Program - See enclosure with names of speakers, affiliation, title of paper and arrangement by Sessions. There will be 10 sessions of a half a day each. All papers will be given in a single conference room to which all participants and delegates and guests are invited. Open discussion will follow each paper as time permits. The final program will be printed and distributed at the meeting, but very few changes are anticipated. Program Chairman Ghilleen T. Prance and his committee have arranged the program to give the greatest coverage possible. We regret there is no room on the symposium for additional papers.

Poster and Lecture and Demonstration - For those persons who feel they have something to contribute on the subject of the symposium but are not on the organized program, poster and lecture and demonstration sessions will be arranged for evenings after dinner in the conference room of the Hotel. Depending on the interest, these will be scheduled the second and third evenings. If this type of presentation will also facilitate your attendance at the Symposium by permitting your Institution to pay for your ticket and per diem, please indicate this information; however, it must be made clear that the choice of such poster presentations will depend entirely upon the Program Chairman and his Committee after they review your title and abstract. Such presentations should not include slides. Send your title, abstract and any pertinent information by December 15 to:

Dr. Ghilleen T. Prance
Program Chairman -ATB 5th Symposium
New York Botanical Garden
Bronx Park
Bronx, New York 10458 USA

Registration Fee - One rate - \$40.00 (US dollars) See enclosed Preregistration form which should be returned immediately to Secretary-Treasurer Evans at address shown above. Please include advance registration fee if at all possible, or indicate it will be paid later. Payment now will aid the ATB and cause less confusion at registration. The Secretary-Treasurer of ATB can only accept dollars or cruzeiros in Brazil, no other currency. Sorry.

Symposium Headquarters and Meeting Place - TROPICAL HOTEL MANAUS

Modern, luxurious, all rooms airconditioned, stores, coffee shop, two restaurants, more stores, barber shop and hair dresser, swimming pool, bars, night club, travel offices, Varig airline ticket office, located along the white sands of Rio Negro 10 minutes from new Manaus Airport and 20 minutes from downtown Manaus. Shuttle buses available from hotel to airport and downtown every half hour, reasonable rates. Single - \$40.00 US; Double - \$50.00; Triple \$71.00. Each rate subject to 10% service charge and 5% City Tax. Continental Breakfast included in price. American breakfast extra. Credit cards accepted: Am Express, BankAmericard, Diners Club, Master Charge, and Varig.

Hotel Reservations in Tropical Hotel Manaus. The ATB Office of the Secretary-Treasurer in Washington, D.C. has made special arrangements with the Manager of the Washington, D.C. office of Varig for the two of us to coordinate all activities and reservations since Varig manages the hotel. He will guarantee holding rooms if we handle reservations directly with this office and not a travel agent for TROPICAL HOTEL MANAUS. Therefore, immediately send me enclosed Room Reservation Form, with a deposit for one night. We can only guarantee rooms accompanied by the deposit. Read the form carefully.

If you wish to join with someone in a double or triple to save money, indicate the names of such persons and send the appropriate amount in deposit.

The convenience of everyone being in one hotel, eating together, exchanging ideas, enjoying the swimming pool and nearby bar, overcomes the slightly cheaper price of some hotels in downtown Manaus. After adding cost of transportation, etc. it is not that much better and the facilities are definitely not as pleasant, attractive and comfortable as the Tropical Hotel Manaus.

Other Hotels in Manaus. Deal with your travel agent. The ATB will not be responsible for any hotel reservations except in the Tropical Hotel Manaus.

Airline Reservations. Except for the invited participants in the Symposium, shown on the enclosed tentative program, for whom the ATB will handle all their travel arrangements, all travel arrangements are up to you and your travel agent or university travel office. However, since most connections depend on VARIG Flight RG 807 out of Miami at 21:00 on Wednesday, February 7, 1979 stopping in Caracas and leaving 01:00 February 8, 1979 for Manaus on same flight and arriving in Manaus 3:40 in morning, we need to have some idea of how many are planning to attend. The manager of Varig guarantees that if we can inform him in December the approximate number of persons taking this flight with connections in Miami from various parts of the world, Varig will have a larger plane or another section, etc. So let me know your tentative plans by sending your preregistration form and hotel reservation form immediately with an indication of your proposed flight plans.

Manaus is not the end of the world, but flights in and out are not daily except within Brasil, so why not plan a few days ahead of time to enjoy INPA's scientific facilities (INSTITUTO NACIONAL DE PESQUISAS DA AMAZONIA) just a few kilometers from the hotel, or plan excursions on the Rio Negro, the Rio Amazon, etc. or the free port shopping in Manaus. Some might wish to come via Belem to visit the facilities and staff of the Museu Paraense Emilio Goeldi, the campus and facilities of the Universidade Federal do Par , or the city. You might consider staying longer in Brazil to enjoy Carnival; however, if you do plan this be sure your travel agent works on both hotel and airline reservations now for advance bookings are heavy especially for the major cities.

In addition to VARIG, other international airlines have service. Consult your AIR FRANCE office for Paris - Manaus and BRANIFF from Miami to Manaus via Bogota, departing only on Friday, and from New York via Bogota to Manaus departing on Sunday only.

Within Brazil and from Bolivia in addition to VARIG, CRUZEIRO flies from Rio de Janeiro, S o Paulo and Bras lia to and from Manaus, with numerous other connecting flights to other Brazilian cities.

See the proposed schedule of opening and closing ceremonies and daily schedule, enclosed as a separate sheet to plan your time of arrival and departure.

General Information.

Climate - January to July is the winter or rainy season. It usually rains several times a day, then clears off with the sun coming out. While raining it falls heavily. Median temperatures during this time of year vary between 23° C (72° F) and 30° C (86° F).

Due to the cold airconditioning in the hotel and meeting room and dining rooms, women might find a shawl useful and men might find a light suit coat comfortable.

Brazilians are informal today and even in the best dining room in the hotel informal clothes are welcome.

Electric power in Manaus is AC, 110 volts, 60 cycles. Some European electrical appliances may need adaptors.

Store hours in Manaus observe the noon siesta . Open 8:00 AM - noon and 2:00 PM - 6:00 PM; Saturday 8:00 AM - 12 noon only and closed on Sunday.

Cost of meals is about like any major US city, or major city in Europe; drinks are higher.

Foreign exchange. It is illegal to exchange foreign currencies in places other than authorized agencies - banks or the Tropical Hotel Manaus. You may pay for the hotel bill by converting foreign currencies at the quoted rate in the hotel; various credit cards may also be used. See page 1.

excursions

Excursions. There will be no official ATB before or after symposium as of this date of planning. However, at the meeting arrangements will be possible for those who want to arrange for short excursions through Tropical Tour Agencies at the hotel. Hopefully INPA will have official tours to the various labs which will be arranged by signing-up ahead of time at the meeting for a specific morning or afternoon. Remember it is the rainy season and extensive travel is not always easy during this time of year. If someone is particularly interested in organizing something more ambitious in terms of excursions, please correspond with Secretary-Treasurer Evans but be prepared to take the initiative and carry it out because Evans has enough problems getting funding for the participants, making other arrangements, etc. without becoming a tour agent for excursions. The Hotel has an official tour agency called, Tropical Tours Agencies, Ltda. Tropical Hotel Manaus, located in main lobby of hotel and open daily 7:00 AM - 7:00 PM or you may use your own travel agent.

Collecting trips of scientific specimens of any sort-(biological, geological, ethnological, paleontological, archeological, zoological, etc.):

The laws in Brazil are very strict and NO collecting of any sort can be carried out without applying for such a permit through official channels many months ahead of time. If you are interested, you must have made the arrangements with a Brazilian colleague and be sure the whole thing is clearly scientifically organized and conforms to all the laws and restrictions. One does not just stop along the road or get out of a boat and collect! The ATB has informed all Brazilian authorities that it is warning its members, and those who attend the symposium and are not members, of these restrictions and that the ATB is not responsible for anyone's actions in this matter, nor can it post bail if you get arrested. Please respect Brazilian law and Brazilians' point of view.

"Intensified studies of plants, vegetation, and ecosystems of the tropics is not some esoteric or arcane aspect of pure science, but essentially an area of applied biology which is much neglected" (Tomlinson & Raven). "In the American tropics alone, the richest in terms of species of plants and animals of the world's three major tropical areas, there are probably over a million unnamed and mostly uncollected species of organisms. A majority of these will become extinct during the next 25 years, and most will never have been collected even once by the time they disappear from the face of the Earth" (Raven).

This Symposium gives an overview of many important aspects of tropical botany. The urgent need for basic biological information is stressed in each of the papers.



SOLICITAÇÃO DE VISTO PARA PESQUISADOR ESTRANGEIRO

1.0 - DADOS GERAIS

- 1.1. - INSTITUIÇÃO SOLICITANTE:
Soliciting institution: INPA; Manaus, Amazonas
- 1.2. - LOCAL DE TRABALHO:
Location of work: INPA; Manaus, Amazonas
- 1.3. - DESCRIÇÃO DAS ATIVIDADES QUE SERÃO REALIZADAS:
Description of activities to be carried out:
Collection of botanical material for study
- 1.4. - INÍCIO DAS ATIVIDADES:
Start date of activities: First week of September, 1980
- 1.5. - DURAÇÃO DO CONTRATO:
Duration of contract: 4 months
- 1.6. - SALÁRIO MENSAL:
Monthly salary: None. Self supporting.
- 1.7. - OUTROS BENEFÍCIOS:
Other benefits: None.
- 1.8. - INSTITUIÇÃO RESPONSÁVEL PELO PAGAMENTO DE SALÁRIOS E OUTROS BENEFÍCIOS:
Institution responsible for payment of salaries and other benefits:
- 1.9. - TIPO DE VISTO SOLICITADO:
Type of visa requested: Temporary I
- 1.10. - OBSERVAÇÕES:
Observations:

2.0. - DADOS PESSOAIS

- 2.1. - NOME:
Full name: Bernard Lowy
- 2.2. - NACIONALIDADE:
Nationality: U.S.A.
- 2.3. - ESTADO CIVIL:
Marital status: Married
- 2.4. - SEXO:
Sex: Male
- 2.5. - LOCAL E DATA DE NASCIMENTO:
Location and date of birth: New York, NY, U.S.A. 29 February 1916
- 2.6. - FILIAÇÃO:
Parents: Fred and Mary Lowy (deceased)
- 2.7. - PAÍS DE RESIDÊNCIA:
Country of residence: U.S.A.
- 2.8. - ENDEREÇO PARTICULAR:
Home address: 622 Castle Kirk, Baton Rouge, LA 70808
- 2.9. - ENDEREÇO PROFISSIONAL:
Work address: Botany Department, Louisiana State University, Baton Rouge, LA 70803
- 2.10. - OBSERVAÇÕES:
Observations:



CIFOR

CENTRO DE PESQUISA INTERNACIONAL
DE INVESTIGACAO FLORESTAL

DECLARAÇÃO DE COMPROMISSO

STATEMENT OF COMMITMENT

NUMERO (NUMBER)

Declaro, para fins da realização de expedição científica no Brasil, cumprir as leis do País, e especialmente o estabelecido no decreto nº 65057 de 26 de agosto de 1969 do qual tenho pleno conhecimento.

I hereby declare, for the purpose of carrying out a scientific expedition in Brazil, that I shall abide by the Laws of the Country, especially as determined by decree nº 65,057 of 26 August, 1969, and of which I am fully aware.

Baton Rouge, LA, U.S.A.

LOCAL (PLACE)

10 / VII / 1979

DATA (DATE)

B. Lowry

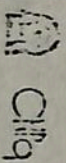
ASSINATURA (SIGNATURE)

Charles F. Schreyer

1º TESTEMUNHA (1st WITNESS)

Shirley C. Tucker

2º TESTEMUNHA (2nd WITNESS)



INSTITUTO DE PESQUISAS CIENTÍFICAS
DE SÃO PAULO
CALLE DO TI. MARCOS

RELACÃO DOS EQUIPAMENTOS NECESSÁRIOS
À REALIZAÇÃO DA EXPEDIÇÃO CIENTÍFICA
LIST OF THE EQUIPMENT NECESSARY TO CARRY
OUT THE SCIENTIFIC EXPEDITION

NÚMERO (NUMBER)

RELACIONAR PELA EXPEDIÇÃO (PERSON RESPONSIBLE FOR THE EXPEDITION)

Dr. Chilleen T. Prance

INSTITUÇÃO À QUE PERTENCE: (INSTITUTION TO WHICH HE BELONGS)

The New York Botanical Garden

EQUIPAMENTOS (USAR TANTAS VÍAS QUANTAS SEJAM NECESSÁRIAS): [EQUIPMENT (PLEASE USE AS MANY FORMS AS NECESSARY)]

Minimal personal photographic equipment. No special equipment necessary.

LOCAL E DATA:
(PLACE AND DATE)

11

ASSINATURA DO RESPONSÁVEL:
(SIGNATURE OF THE PERSON RESPONSIBLE FOR THE EX-
PEDITION)

ASSINATURA DO PRINCIPAL PATROCINADOR:
(SIGNATURE OF THE PRINCIPAL SPONSOR)

VIA JE
VIA GEM

M-25-VIII See 8
Lv BR. 7:50 AM - Δ 418
Ar ATL. 10:11 AM
404-231-1737

~~27~~-VIII W. Doris
Lv. ATL. 9:28 AM - Δ 234
Ar Bost. 11:45 AM
617-787-4640 (DOR)

914-235-6385
(SINAO)
29-VIII - F MAXINE ^{Syd/MARG} Will/Bobs
Lv. Bost. 10:00 AM - Δ 918
Ar NY 10:56 - NEWARK
201-678-2029
(EORANGE) MME

914-379-3540 (SYD)
Lv. NY 3-1X
Lv NY 5:20 PM - NATNL 498
Ar MIA 7:58
Lv MIA ~~10:25 PM~~ 9 VARIG
Ar MAN 3:40 AM RG 807

NEW PASSPORT NO
K2900384
EXPIRES: 12-XII-1984
ISSUED NEW ORLEANS
VII-1979

Lv. BR 7:50 AM - Δ 418
Ar. ATL. 10:11 AM M.
108.00

Lv. ATL. 9:28 AM - Δ 234
Ar. Bost. 11:45 W.
172.00

Lv. Bost. Δ 918 4:45 PM / 5:33
~~10:00 AM~~ - Δ 918
Ar. NY 10:56 - NEWARK
57.00

O.W. \$339 -
*WORLDWIDE - 344-9927
EBERRY
(A300 Airbus) (KENNEDY) EA 27
Lv. NY 5:00 PM - 3-1X W
Ar. MIA 7:51 PM
Lv. MIA 9:00 PM - VARIG
Ar. MAN 3:40 AM - 4-1X

MON. ONLY
NY → Miami (3-1X)
5:20 PM 7:58 PM NATNL 498
Lv. MIA 10:25 PM
Ar. MANAUS 4:45 AM
LLOYD AERO-BOLIVIA no

WED. ONLY
Lv. Miami 9 PM
Ar. MANAUS 3:40 AM VARIG
(via CARacas) 1 AM
W. 3-1X
RG 807

FRI. ONLY
Lv. Miami 5 PM (5-1X)
Ar. MANAUS 1:15 AM
BRANIFF
(via Panama - Bogota)

from Independence Inver
924-0343
MARIONNE

Bruce Nelson
INPA - Botanicq
Caixa Postal 478
69.000 Manaus, Amazonas
Brasil
TEL. 236-3925

Phoned home: 13-VIII.

GILLEAN PRANCE (6-VIII-'80)

"MICKIE" (to Bermuda)

Call White Plains, (home)

(914)-949-1213

GARDEN: (212) 220-8628

my ticket to Manaus
held at GARDEN. also
funds for expedition. (TUES 2-IX)

Bring tree trimmer

LV NY (LA GUARDIA) via

EA 21. 2 PM

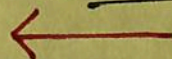
(3-IX)

Ar. M.I. 2. 4:40 PM

LV. " 9:00 PM [VARIG]

AR. MANAUS. 3:40 AM

GILLEAN phoned (914) 6-VIII (u)



WESTERN UNION
512,
INTER-NATIONAL

Authorization not received as of wed. 13-VIII-'80.
T-19
F. 15

Brazilian Consulate N.O.

504-588-9187

Ms Cory

10 AM - 3 PM
M-F

1306 TRADE MART

8-VIII-'80

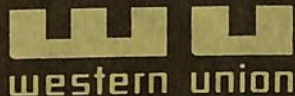
Bidu Sayão

VILLA-LOROS (b. 1908)

Bachianus Brasileiras

(8 cellos ... "Songs
without words")

Sang in Manaus Opera House
il. Teatro Amazonas



Telegram

MSG. NO.	NO. WORDS CL. OF SVT.	PD.-COLL.	CASH NO.	ACCOUNTING INFORMATION	DATE	FILING TIME	SENT TIME
				F. 15-VIII-20		NDON A.M. P.M.	A.M. P.M.

Send the following message, subject to the terms on back hereof, which are hereby agreed to

TO BRUCE NELSON INPA

☐ OVER NIGHT TELEGRAM
UNLESS BOX ABOVE IS CHECKED THIS
MESSAGE WILL BE SENT AS A TELEGRAM

ADDRESS & TELEPHONE NO.

\$7.13

CITY - STATE & ZIP CODE

VISA NOT RECEIVED BY NEW ORLEANS

CONSULATE PLEASE CONTACT APPROPRIATE
AUTHORITIES TO EXPEDITE

SPACE- b. 10 SEPT. 1817
[1849-64] d. 22 DEC. 1893

SENDER'S TEL. NO.

NAME & ADDRESS

(Area Code)

(Zip Code)

ALL MESSAGES TAKEN BY THIS COMPANY ARE SUBJECT TO THE FOLLOWING TERMS:

To guard against mistakes or delays, the sender of a message should order it repeated, that is, telegraphed back to the originating office for comparison. For this, one-half the unrepeated message rate is charged in addition. Unless otherwise indicated on its face, this is an unrepeated message and paid for as such, in consideration whereof it is agreed between the sender of the message and the Telegraph Company as follows:

1. The Telegraph Company shall not be liable for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the unrepeated-message rate beyond the sum of five hundred dollars; nor for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the repeated-message rate beyond the sum of five thousand dollars, unless specially valued; nor in any case for delays arising from unavoidable interruption in the working of its lines.

2. In any event the Telegraph Company shall not be liable for damages for mistakes or delays in the transmission or delivery, or for the non-delivery, of any message, whether caused by the negligence of its servants or otherwise, beyond the actual loss, not exceeding in any event the sum of five thousand dollars, at which amount the sender of each message represents that the message is valued, unless a greater value is stated in writing by the sender thereof at the time the message is tendered for transmission, and unless the repeated-message rate is paid or agreed to be paid and an additional charge equal to one-tenth of one percent of the amount by which such valuation shall exceed five thousand dollars.

3. The Telegraph Company is hereby made the agent of the sender, without liability, to forward this message over the lines of any other company when necessary to reach its destination.

4. The applicable tariff charges on a message destined to any point in the continental United States listed in the Telegraph Company's Directory of Stations cover its delivery within the established city or community limits of the destination point. Beyond such limits and to points not listed in the Telegraph Company's Directory of Stations, the Telegraph Company does not undertake to make delivery but will endeavor to arrange for delivery by any available means as the agent of the sender, with the understanding that the sender authorizes the collection of any additional charge from the addressee and agrees to pay such additional charge if it is not collected from the addressee.

5. No responsibility attaches to the Telegraph Company concerning messages until the same are accepted at one of its transmitting offices; and if a message is sent to such office by one of the Telegraph Company's messengers, he acts for that purpose as the agent of the sender; except that when the Telegraph Company sends a messenger to pick up a message, the messenger in that instance acts as the agent of the Telegraph Company in accepting the message, the Telegraph Company assuming responsibility from the time of acceptance.

6. The Telegraph Company will not be liable for damages or statutory penalties when the claim is not presented in writing to the Telegraph Company, (a) within ninety days after the message is filed with the Telegraph Company for transmission in the case of a message between points within the United States (except in the case of an intrastate message in Texas) or between a point in the United States on the one hand and a point in Alaska, Canada, Mexico, or St. Pierre-Miquelon Islands on the other hand, or between a point in the United States and a ship at sea or in the air, (b) within 95 days after the cause of action, if any, shall have accrued in the case of an intrastate message in Texas, and (c) within 180 days after the message is filed with the Telegraph Company for transmission in the case of a message between a point in the United States and a foreign or overseas point other than the points specified above in this paragraph; provided, however, that this condition shall not apply to claims for damages or overcharges within the purview of Section 415 of the Communications Act of 1934, as amended.

7. It is agreed that in any action by the Telegraph Company to recover the tolls for any message or messages the prompt and correct transmission and delivery thereof shall be presumed, subject to rebuttal by competent evidence.

8. Special terms governing the transmission of messages according to their classes, as enumerated below, shall apply to messages in each of such respective classes in addition to all the foregoing terms.

9. No employee of the Telegraph Company is authorized to vary the foregoing.

10-71

DOMESTIC SERVICES

TELEGRAM

The fastest domestic service. Accepted for immediate transmission. (Refund will be made upon written application when delivery or delivery attempt is not made within 4 hours for teline or telephone delivery and 6 hours for physical delivery. Specific conditions and certain exceptions are posted in all public offices.)

OVERNIGHT TELEGRAM

Economical overnight service. Accepted up to midnight for delivery as early as possible the following day at rates lower than telegrams. (Refund will be made on written application when delivery or attempt not made by 2:00 P.M. the following day. Specific conditions are posted in all public offices.)

INTERNATIONAL SERVICES

FULL RATE (FR)

The fastest overseas service. May be written in code, cipher, or in any language expressed in Roman letters.

LETTER TELEGRAM (LT)

For overnight plain language messages, at half-rate. Minimum charge for 22 words applies.

SHIP RADIOGRAM

For messages to and from ships at sea.

(1945)
LIBRARY
4-23

VILLALBA-LOPEZ - BRASILEIRAS No 5 (6:50) LP 7389 - 7454 (LSU)
(1945) W. LEONARD ROSE - CELU

SAYAO - 1935 w. TOSCANINI
1937 - DEBUT MET. MANNAN

1459 - LAST PUBLIC APPEARANCE

MANAUS ?

COLUMBIA
MONO 3216 0377

LSU 7454

2 ODYSSEY
BACHIANAS BRASILEIRAS
NO. 5

VILLA - LOPEZ

Recorded but 1941-1950

(1942)
LIBRARY
7-12
AH, NON CREDETE
LA SANNA MOLA
SEMPLA
LIBERA
CRUCE DEL

5-IX from Bruce Nelson

Memorandum of Understanding

PROJETO FLORA ACRE EXPEDITION -- 10 SEPT. TO 30 NOV., 1980

Trip Participants

USA Dr. Bernard Lowy (10 Sept - 30 Nov)
Stuart Lowrie (10 Sept - 30 Nov)
Bruce Nelson (20 Sept - 30 Nov)

BRAZIL Ermelinda Freire (10 Sept - 30 Sept)
Ubirajara Maciel or
Benedito Rabelo (30 Sept - 30 Nov)
Manoel Morreira (climber) (10 Sept - 30 Nov)
1) INPA driver, name unknown (10 Sept - 30 Nov)
Waldir Marques de Souza
2) INPA driver, Edimar Rufino de Albuquerque (10 Sept - 30 Nov)

Vehicles

- 1) Toyota jeep from Dept de Botânica
- 2) Kombi van from INPA setor de Transporte (loaned to Projeto Flora)

The kombi is getting a complete maintenance review and repair before leaving for the field, with the understanding that NSF/CNPq will pay for a second complete checkup and repairs after returning from the field.

Finances

It is recommended that Dr. Lowy and Dr. Rodrigues discuss the financial contributions Projeto Flora (INPA) will make toward such field expenses as food and lodging of Brazilians, vehicle maintenance and repair, additional hired transportation, plant shipments to Manaus, additional hired field men or guides, equipment and supply purchases.

Equipment and Supplies

For initial outfitting the Acre expedition may draw from two sources: (1) material left over from previous PFA trips and stored by B. Nelson, and (2) material belonging to the Botany Division and stored by Evandro Soares. A list of recommended equipment and supplies for road trip collecting has been drawn up by Bruce Nelson. Any additional purchases by NSF or INPA should be approved first by Dr. Lowy or Dr. Rodrigues respectfully.

**CNPq**

CONSELHO NACIONAL DE DESENVOLVIMENTO CIENTÍFICO E TECNOLÓGICO

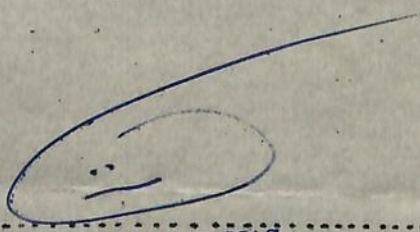
ILMO. SR.(a).

DR. BERNARD LOWY
.....

Comunicamos que a taxa do apartamento nº 9.....
ocupado por V.S.a. é de CR\$ 300,00 (TREZENTOS CRUZEIROS)
..... por dia, sendo que a não devolução da chave do
mesmo acarretará a inclusão de CR\$ 300.00 (trezentos cruzeiros)
na despesa final.

Solicitamos comparecer ao setor de alojamentos (sala do Projeto Tucuruí) para encaminhamento a tesouraria.

Atenciosamente


.....
VANIA C. DIAS
Alojamentos

03

SETEMBRO

80

Manaus..... de 19.....

Received: 4-VI-1980

PROJETO FLORA - Memorandum of Understanding between
CONSELHO NACIONAL DE DESENVOLVIMENTO CIENTIFICO E TECNOLÓGICO (CNPq)
and THE NATIONAL SCIENCE FOUNDATION (NSF).

Considering that the inventory of native plant resources of northern Brazil which is being carried out by Projeto Flora Amazonica of the Programa Flora of the CNPq is making a significant contribution to the field of science and technology;

that there is an interest from North American scientists to participate in the project;

that collaborative work between Brazilian and North American scientists is highly desirable because it will accelerate the accumulation of knowledge about the native plant resources of Brazilian ecosystems;

that among the activities of the project it is necessary to organize a series of botanical expeditions, which will facilitate the accomplishment of as complete an inventory as possible of the flora of that region;

and that the CNPq is interested in the participation of North American botanists in these expeditions, the following understanding has been reached.

1.0 For their part the CNPq will:

1.1 Furnish the means of transport for the expeditions through the use of vehicles of host institutions and their associated organizations.

1.1.2. In the event that these institutions do not have vehicles available, the rent of the vehicle or boat hire or cost of any other means of transport will be divided between the Brazilian and North American side in direct proportion to

the number of botanists of each nation participating on the expedition.

1.2. Furnish field assistants (motorists, boat pilots, guides, collectors, etc.) belonging to the host institutions.

1.2.1. In the event that the institutions do not have such field assistants the expenses of contracting and maintaining them will be divided between the Brazilian and North American sides in proportion to the number of botanists of each nation participating on the expedition.

1.3. Arrange if the host institution for an appropriate and permanent place to store and maintain equipment and other items used on the botanical expeditions.

1.4 Pack and arrange the shipping of the part of the botanical material collected on the expedition which is destined for North America.

1.5 Arrange for the issue of the permit which is required for each expedition in compliance with Decree No. 65,057 of August 26, 1969.

1.6. Obtain from FUNAI, in compliance with their regulation No. 447/N of September 12, 1971, the license necessary for entrance into any area with indigenous population should expeditions take place in such areas.

1.7. Facilitate the obtention of visas for North American participants from the Ministry of Foreign Relations.

1.8. Inform the Brazilian participants of the terms of this document.

2.0 On the other side the National Science Foundation (NSF) through its representative, as designated in Item 4.1 of this document, agrees to:

2.1. Be responsible for all the fuel costs of the joint expedition and for the travel and subsistence costs of the North American participants.

2.2. Be responsible for the freight charges for all shipments of botanical material to the United States.

2.3. Recommend to the North American participants that they publish the results of their research on the botanical material collected in Brazilian scientific journals, especially in Acta Amazônica.

2.3.1. In the event that results are published in other journals, the author must provide the library of the Instituto Nacional de Pesquisas da Amazônia (INPA) 3 (three) copies of the publication, authorizing the CNPq the right to publish it (in its entirety or in part) in Portuguese in any Brazilian scientific or technological journal.

2.3.2. Whenever possible, send to the CNPq at least a preliminary note for publication in Acta Amazônica about any subjects related to material or data collected on expeditions.

2.4. Inform the North American participants about the contents of Decree No. 65.057 of August 26, 1969 which governs scientific expeditions in Brazil, and the terms of this Memorandum of Understanding.

2.5. Inform the North American participants of the necessity to obtain a temporary special visa before their arrival in Brazil. This condition is compulsory in order to take part in a scientific expedition in Brazil.

2.6. Furnish the CNPq at least 60 days before any joint expedition in Brazil the name of each North American participant, his complete curriculum vitae, and the following forms completed and signed by each participant: "Declaração de Compromisso" (Promise to obey the terms of Decreto 65,057); "Autorização para publicação Técnica e Científica em Português" (Authorization for results to be translated and published in Portuguese); "Solicitação de Visto para Pesquisador Estrangeiro" (Application for a visa for a foreigner researcher).

3.0. The signatory organizations agree jointly that:

3.1. Expeditions with North American participants will only take place after the obtention of the obligatory authorization called for by Decree 65,057 of August 26, 1969, and with the advance agreement of the host institution.

3.2. Expeditions made under this agreement will always have two leaders, one Brazilian and one North American who will arrange between themselves all the details of the expedition. The final authority of any expedition will always be with the Brazilian leader.

3.3. Expeditions should ideally have four botanists, two from each nation. Expeditions with a larger or smaller number of participants may be arranged if a prior agreement has been reached by the two parties.

3.4. More than one expedition may be programmed to be in the field at the same time as long as each one has a different host institution.

3.5. The itinerary and the duration of each expedition should be arranged in advance by the participating botanists, establishing an agreement about the financial responsibilities of each party.

3.5.1. In the event that during an expedition a change in itinerary or extension of its duration or any other unforeseen circumstances occur which involve extra expense, both parties, through their leaders, will decide together how to proceed and will prepare a signed agreement of their decisions.

3.6. The North American participants, after their return from an expedition and before their departure from the host institution should, in conjunction with the Brazilian participants, give a brief written report of the expedition to the subregional coordinator of Programa Flora based in the host institution.

7 | The report should contain at least: date of departure and return from the field, itinerary of expedition, names of all participants and any other pertinent information. The report should be accompanied by a joint financial statement about the expenses during the expedition, giving details of the contributions of each party. It should also detail the planned disposition of any left-over expendible material bought for the expedition (fuel, food, etc.).

3.6.1. Within six months from the date of the end of the expedition each leader should prepare for the representatives of the CNPq and NSF mentioned in Item 4.1 of this document a report giving: details of the work carried out, the results obtained, the material collected, the institutions in which material was deposited, and any other pertinent information.

- 3.7. The normal maintenance costs of the vehicles used on the expedition will be divided between the Brazilian and North American parties proportionally to the number of botanists participating from each side.
- 3.8. Any losses or accidental damage to permanent equipment and other materials used on the expedition will be the sole responsibility of the party to which they belong.
- 3.9. The CNPq will not in any way be responsible for problems resulting from illness, death, personal accidents, or any other misfortunes which might happen to the North American participants during their stay in Brazil.
- 3.10. The division of botanical material collected on the expeditions should obey the following sequence : a) the first set, containing one sample of each plant collected, including all unicates, must stay in Brazil; b) the second set will be sent to the United States; c) the third set will be reserved for sending to specialists; d) the remaining sets will be divided alternately between Brazil and the United States.
- 3.10.1. Whenever possible, 11 samples of each plant should be collected.
- 3.10.2. The division of the material should be made by the Brazilian leader, allowing the participation of the North American participants or their representatives if they so desire.
- 3.11. In addition to the collection of botanical material, mutual cooperation in other areas should be encouraged such as participation in seminars, talks and courses.

3.12. Cooperation should also be increased between scientists of both nations in the area of data processing of botanical data to facilitate the installation of the computerized data bank of Programa Flora.

4.0. General Considerations

4.1. Representatives of each party will be designated who will be responsible for the general coordination of the expedition program and for the strict observance of the terms of this document of understanding.

4.1.1. It will be the responsibility of the representatives to answer problems in case of uncertainties and to resolve any points omitted from this document.

4.2. The expeditions covered by this document will not be permitted to collect anything other than botanical material (rocks, fauna, anthropological material, etc., may not be collected).

4.2.1. When necessary, pollinating insects may be collected, and divided between both parties in accordance with Item 3.10 above.

4.2.2. Any results of chemical analysis from chemotaxonomy or microanalysis should be reported to the CNPq. More detailed bulk studies must be made through specific projects approved individually by the CNPq.

Bruce Nelson
INPA - Botânica
Caixa Postal 478
69.000 Manaus AM
Brazil

Dr. B. Lowy
Dept. of Botany
Louisiana State U.
Baton Rouge LA.

Dear Bernard:

I fear my tree trimmer request will be somewhat burdensome for you with all the stops you are making but I think they will be worth the effort. The type you described to me seems suitable.

According to Brasilia your visa authorizations should now be in the USA. Please call your local consulates to check on this. Should there be any problems you can call me in Manaus at 236-5700 during the day or (better) at night at 236-3860 after 17 August. I will be on a field trip 27-29 August.

Our trip leader will be Ubirajara Marciel. The cars should leave INPA by 10 Sept and head as far toward Guayris do Sul as possible. You can either leave w/ the cars or fly down to Rio Branco and meet them.

Regards,

Bruce

MAILGRAM SERVICE CENTER
MIDDLETOWN, VA. 22645

western union

Mailgram®



4-020591S224002 08/11/80 ICS IPMBNGZ CSP ALXD
1 5043885142 MGM TDBN BATON ROUGE LA 08-11 1122A EST

LSU UNION JB
PO BOX BU
BATON ROUGE LA 70893

THIS MAILGRAM IS A CONFIRMATION COPY OF THE FOLLOWING MESSAGE:

LT TDBN BATON ROUGE LA 29/28 08-11 1122A EST
INT LT BRUCE NELSON
INPA BOTANICA CAIXA
POSTAL 478 69000
MANAUSAMAZONAS (BRAZIL)

VISA NOT YET RECEIVED. MUST LEAVE BATON ROUGE 22 AUGUST HAVE ALUMINUM
TRIMMER
LOWY BOTANY DEPARTMENT LSU BATON ROUGE

COL 478 69000 22

1124 EST

MGMCOMP MGM



The New York Botanical Garden

M.
18-VIII-80

2nd Degree
Burr!
going to BERMUDA

XXXXXXXXXXXX

XXXXXXXXXX

Mickie called from NYBG:

Send telegram from
NY re arrival time

- 1) VISA AUTHORIZATION MADE IN FRI 15-VIII
- 2) NOTIFY STUART LOWRY - GET INTERNAT. DRIVERS LIC -

Bruce Nelson
INPA-Botanica
Cx Postal 478
69.000 Manaus, AM
Brazil

28-07-80

Dr. B. Lowy
Botany Dept.
Louisiana State Univ.
Baton Rouge, Louisiana 70803
USA

Dear Dr. Lowy:

Thank you for your letter of 17 July. I have checked with Brasilia and learned that your visa authorizations should be at your local consulates by 15 August. I can be at the airport to meet you at 3:40 AM, 04 Sept. Will Stuart arrive with you? I expect to have accommodations for you at INPA. Remember to bring your USA driver's license's with you when you come down; they are needed to get Brazilian ones.

By now you should have received my letter of 10 July with answers to many of your questions. I expect it will take about one week to go through the various red tape and preparations here in Manaus. If all goes well we should leave for Acre about 10 Sept and return by 30 Nov in two vehicles supplied by INPA.

It would be good if you could take advantage of this time in Manaus to put determinations on INPA's collections, meet with the INPA micologists and perhaps arrange to give a brief slide show or seminar in your area of specialization.

I plan to stay with your group for the period 10 Sept through 15 Oct. then leave for some collecting at the Mundurucu Indian Reserve. I will be back in Manaus by 30 Nov to help in sorting and shipping specimens. My departure is contingent upon getting FUNAI approval. Also, should you need an extra hand on the second half of the trip, I can delay my visit to the Mundurucu.

The funding situation for the Brazilian side of this convenio has become critical. With 100% annual inflation and huge foreign loan debts, the federal government has slashed all sorts of programs. INPA-Botanica has only the equivalent of a few thousand dollars left in its collecting budget for the rest of this year; they can't send their own people into the field nor meet their commitment to Projeto Flora. I'm afraid NSF will have to foot the bill for the majority of expenses on the Acre trip, but with a little belt-tightening we should have a successful trip.

The New York Botanical Garden

XXXXXXXXXXXXXX

(XXXXXXXXXX)

Bernard Lowy, 28-07-80, pg 2

At my request for assistance, Dr. Murça Pires of the Museu Goeldi has agreed to send his student Ubirajara Maciel and field man Mario Rosa dos Santos. Ubirajara will be the trip leader and I understand that he has collected in Acre before so his experience should be valuable.

I am presently looking for one or two more field men, who we will need to hire in Manaus. I have gotten some fairly good maps of Acre and discussed itinerary ideas with people who know the area. It seems best to drive first as far as we can get toward Cruzeiro do Sul then work our way back slowly since the western roads can be very bad once the rains start.

Since everyone's time is very valuable, I would recommend that the group stay in inexpensive roadside or small town hotels and eat at truckstop or hotel restaurants. This permits everyone to work exclusively on collecting and drying plants rather than domestic chores. However, there will be places where this will not be possible and the cost for the Brazilian participants is sometimes a problem. Daily living expenses in the field are about US\$ 15.00 per person per day. We will also have to hire field men, buy gasoline, butane gas, butane cylinders, newspaper, paper bags, pay air freight to Manaus and then to New York. I would estimate total in-Brazil expedition costs for NSF at between US\$ 12,000.00 and 15,000.00.

Please try to get the two extendible aluminum poles (six to eight meters long when assembled) for our tree trimmers that I asked for in our previous letter. They really increase collecting efficiency.

Until Aug 17 you can reach me by phone in Manaus at 236-3925 in the evenings. After Aug 17 you can leave a message at the same number or telegram INPA.

Regards,

Bruce Nelson

cc. Stuart Lowrie

GRAD STUDENT ANN RABON, m.c. &
PHONE: 313 - 764 - 2407

The Projecto Flora Amazonica is a binational project in which U.S. and Brazilian botanists will collaborate for the purpose of making a detailed survey of the extant flora of representative areas of Amazonian Brazil. The New York Botanical Garden, the American institution sponsoring the project, has invited me to participate in the collection and study of the fungi of the State of Acre, with special emphasis on the Tremellales (Basidiomycetes). It is expected however, that fungi of numerous other groups will also be collected, including principally Ascomycetes and other Basidiomycetes (particularly the Aphyllophorales). These will eventually be shared for study among Brazilian and American mycologists, the latter associated with the New York Botanical Garden and with Louisiana State University.

Because of the vicissitudes of rainfall, geography, and of good fortune in general, it is not possible to accurately predict the number of specimens that will eventually be collected, but in the interval available for field work (early September through November) it may reasonably be anticipated that approximately two to three thousand collections will be found. These are to be distributed among the major collaborating institutions where specialists will study them and report ^etheir findings in appropriate publications. Rapidly changing ecological conditions in the Brazilian Amazon, due to widespread and generally injudicious exploitation of the natural resources of this vast region, lends urgency to floristic studies such as the one here outlined.



The New York Botanical Garden

Bronx, New York 10458

(212) ~~XXXXXX~~
220-8628

August 1, 1980

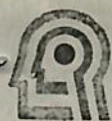
To Whom It May Concern:

This is to certify that Bernard Lowy is a member of the Projeto Flora Amazonica Expedition to Brazil sponsored by this institution. The New York Botanical Garden will be responsible for all his expenses during the period he is in Brazil. He has a separate authorization for the expedition from the CNPq.

New York, 1 August, 1980

Ghilleen T. Prance
Vice President,
Director of Botanical Research

GTP/fm

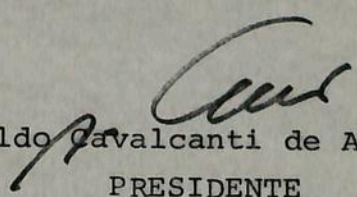


CNPq

CONSELHO NACIONAL
DE DESENVOLVIMENTO
CIENTÍFICO E TECNOLÓGICOD E C L A R A Ç ã O

Declaramos, para os devidos fins, que o Sr. BERNARD LOWY, de nacionalidade norte-americana, foi autorizado por este Conselho a integrar, no período de 01/09/80 a 15/12/80, a equipe participante da Expedição Científica nº EX-14/77-AD/01, de responsabilidade do Dr. ALCIDES RIBEIRO TEIXEIRA, Coordenador do Programa Flora, deste Conselho, com o objetivo de proceder estudo e pesquisa da flora amazônica.

Brasília, 17 de julho de 1980.


Lynaldo Cavalcanti de Albuquerque
PRESIDENTE



The New York Botanical Garden

Bronx, New York 10458

(212) 220-XXXX
8628

MEMO : Projeto Flora Participants - Fall 1980

FROM : G. T. Prance

SUBJECT : Expeditions

DATE : July 9, 1980

Please excuse this rather informal memo to advise you about expeditions on which you will be participating this fall.

I hope to get the permits for a visa within a short while. When this arrives you will be able to get your visa from the Brazilian Consulate which represents your state. In order to get your visa you will need the following documents which you should be obtaining soon:

1. Certificate of good conduct from your local police
2. The official Medical form signed by your doctor and notarized (enclosed)
3. An application form in duplicate (available from the Consulate)
4. Two passport size photographs
5. A copy of your authorization from the CNPq. (I will send this when it arrives!)

The expedition schedule is as follows:

EXPEDITION 3 : Nelson, Lowrie, Lowy

Participants should plan to be in Manaus on September 3 to leave for the field during the first week of September. This expedition will work in the State of Acre as far towards Cruzeiro do Sul as possible. Plans are to return to Manaus about November 30th

EXPEDITION 4 : Prance, Daly, Campbell

Participants should plan to be in Belém on September 15 to leave for the field during that week. This expedition will work in the State of Maranhão from September 20 - November 10, and near Altamira on the Rio Xingu from November 15 - December 15th.

I will send each participant a round trip air fare from your home airport to Manaus or Belém.

I enclose a copy of the Projeto Flora Memorandum of Understanding which outlines the terms of field work under this agreement. I look forward to your participation in the expedition.

G. T. Prance
Gifflean T. Prance
Chairman, PFA

Bruce Nelson
a/c INPA - Botanica
Caixa Postal 478
Estfada do Aleixo
69.000 Manaus, AM
BRAZIL

10-VII-80

Dr. Bernard Lowy
Dept of Botany
Louisiana State University
Baton Rouge, Loisiaana 70803
USA

Dear Dr. Lowy:

I hope all of your preparations are progressing smoothly. I have written CNPq reminding them of your visa requirements. If your visas do not arrive by mid August please telegram me at INPA.

We higher plant people are in desperate need of aluminum tree trimmers. I wonder if you could order two of them from a forestry supply catalogue in the USA and bring them down with you? The type we need comes in sections which fit together to form a rigid, lightweight aluminum pole up to ten meters tall when assembled. The cutting head is removable (heads can be bought in Manaus) and is operated by pulling a light cable or cord.

Manaus has tight import controls, particularly on unaccompanied cargo. Some equipment shipments remain at customs for weeks or months before we can liberate them. I suggest that you bring all equipment in as excess baggage when you fly down. This gives the least trouble and is fairly inexpensive if you come down on an airline that uses the two-piece 70 kilo allowance system.

Have a list of all your photographic equipment and collecting supplies with you at customs in Manaus.

Here in Manaus I can supply presses, corrugates, blotters, drying stoves, Collapsible drying frames, plastic bags, paper bags (not wet resistant), mothballs, 96% alcohol, medicines, and most other necessities. Please bring your own of the following: special chemicals and fixatives, labware (if any), personal canteens, personal rain poncho or umbrella, six pairs of snap-cut garden clippers, plus any specialty items you want.

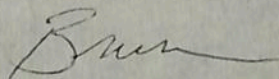
Since INPA is very low on funds the two Brazilian participants are coming from Belem and Sao Paulo. INPA can supply two vehicles (Toyota land cruiser and Fiat hatchback) and perhaps one field person. The second field person may be supplied by Museu Goeldi in Belem. This should all be worked out by the time you arrive.

I have requested that

you and Stuart here at INPA for your stay in the city before and after the trip. These have a low per diem charge. When do you plan on returning to Manaus from the field?

When you have a definite arrival date, send a telegram; I will be at the airport to meet you.

Regards,



Bruce Nelson

cc. Stuart Lowry

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

August 19, 1980

Dear Mrs. Cory:

The enclosed check is to cover your Telex expense in my behalf. In the event that authorization is not received by Friday morning, Aug. 22, please be kind enough to forward my passport after visa authorization has been received to the following address:

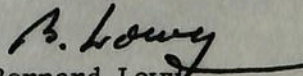
Dr. B. Lowy
c/o Dr. Ghilleen Prance
New York Botanical Garden
Bronx, New York 10458

I plan to be at that address for 1 day only, Tuesday, Sept. 2, so the passport would have to be mailed to me not later than Aug. 28-29 if it is to reach me in time, since Sept. 1 is a holiday.

I am sorry to give you this additional trouble, but I really do not know what alternative I have.

With many thanks for your cooperation,

Sincerely yours,


Bernard Lowy
Professor of Botany

PROJECTO FLORA AMAZONICA - 1980

Sta
A
LAVI
A
LONI

J. Murça Pires
Museu Paraense Emilio Goeldi
Belem, Pará, Brasil

Botanical Evidence For and Against the Refuges

Postal 1061, 86100 Londrina, Paraná.

Status: "Empresa Brasileira de Pesquisa Agropecuária", Ministry of Agriculture.

Mycologist: ÁLVARO MANUEL RODRIGUES ALMEIDA (M.Sc., Agron. Eng.

Phytopathological mycology: *Corynespora cassicola* and *Sevpia glycines*).

MACEIÓ: *Seção de Fitopatologia, Departamento de Melhoramento, Planalsucar, Rua Cansansão 179, Caixa Postal 344, 57000 Maceió, Alagoas.*

Status: "Planalsucar, Coordenadoria Regional Nordeste".

Mycologist: CHHATTHOO RAM (M.Sc., Phytopathological mycology: sugar cane fungus diseases).

MANAUS: *Instituto Nacional de Pesquisas da Amazonia (INPA), Estrada do Aleixo 1756, Km 4, Caixa Postal 478, Aleixo, 69000 Manaus, Amazonas.*

Status: "Conselho Nacional de Desenvolvimento Científico e Tecnológico".

Foundation: 1954.

Herbarium: Amazonian plants and fungi.

Mycologists: AURÉLIA LOPES CASTRILLON (Nat. Hist. Bach. & Lic. Medical and veterinary mycology: prevalence of pulmonary mycoses; mammal hairs and soil dermatophytes).

MARIA DO SOCORRO DE S. FURTADO (Geogr. Lic. Medical and veterinary mycology: soil and mammal dermatophytes).

OSÓRIO JOSÉ DE MENEZES FONSECA (Nat. Hist. Lic. Basic mycology: ecology of aquatic fungi).

ROLF SINGER (Basic mycology: Basidiomycetes: Agaricales).

WAI YIN MOK (Dr., Medical mycology).

MANAUS: *Instituto de Ciências Biológicas de Patologia Clínica, Rua Afonso Pena 910, Adrianópolis, 69000 Manaus, Amazonas.*

Status: University of Amazonas.

Mycologists: GENY BRELAZ DE CASTRO CAVALCANTE (Physician, Medical mycology).

NATAL: *Empresa Brasileira de Pesquisas Agropecuárias, 59000 Natal, Rio Grande do Norte.*

Status: Ministry of Agriculture.

Mycologist: AURI ALAECIO SIMPLÍCIO (Agron. Eng. Phytopathological mycology).

NITEROI: *Universidade Federal Fluminense, 24000 Niteroi, Rio de Janeiro.*

Status: Ministry of Education.

Mycologist: JAIME CARNEIRO (Livre-Doc., Dr., Physician. General medical mycology).

PACAJUS: *UEPAE de Pacajus, Estrada Municipal de Pacajus-Itaipaba, Km 05, 62870 Pacajus, Ceará.*

Status: "Empresa Brasileira de Pesquisa Agropecuária", Ministry of Agriculture.

Mycologist: LIANNA MARIA SARAIVA RODRIGUES (Agron. Eng. Phytopathological mycology: chemical control, physiology and pathogenicity of *Colletotrichum gloeosporioides* in cashew-plant anthracnose).

HUMBERTO C. BATISTA

442 UNIV. MANAUS

C.P. 301

6900 MANAUS

(de José Ramirez, LSU. 3-IV-79)

TAXON VOLUME 28

Aug. 1979

BAURU: *Faculdade de Odontologia de Bauru, Departamento de Patologia; Alameda Otávio Pinheiro Brisola 975, Caixa Postal 73, 17100 Bauru, São Paulo.*

Status: "Universidade de São Paulo".

Mycologist: ANTONIO LÁZARO VALERIANI MARQUES (Physician. Medical mycology: general mycoses).

BELÉM: *Centro de Pesquisa Agropecuária do Trópico Úmido, Laboratório de Fitopatologia, (IAN), Caixa Postal 48, 66000 Belém, Pará.*

Status: "Empresa Brasileira de Pesquisa Agropecuária", Ministry of Agriculture.

Foundation: 1945.

Herbarium: 2000 specimens of fungi, mainly Amazonian fungi.

Mycologists: FERNANDO CARNEIRO ALBUQUERQUE (Phytopathological mycology).

F. C. O. FREIRE

MARIA DE LOURDES REIS DUARTE (Phytopathological mycology: phytopathologic fungi of tropical plants).

S. A. S. TABOSA

BELÉM: *Departamento de Dermatologia da Universidade Federal do Pará, 66000 Belém, Pará.*

Status: Federal University of Pará.

Mycologists: DOMINGOS BARBOSA DA SILVA (Physician. Medical mycology).

JACI PINA NAZARÉ (Physician. Medical mycology).

JOSÉ MONTEIRO LEITE (Physician. Medical mycology).

MARIO MACHADO SAMPAIO (Physician. Medical mycology).

TARCÍSIO NICOLAU CARVALHO (Medical mycology).

BELÉM: *Instituto Evandro Chagas, Seção de Patologia e Micologia, Caixa Postal 621, 66000 Belém, Pará.*

Status: Public Health Service Foundation.

Mycologists: CRAIG H. LLEWELLYN (Medical mycology).

MARGARIDA MARIA ROQUE ALMEIDA (Pharm. Medical mycology).

MARIO AUGUSTO PINTO DE MORAES (Physician. Medical mycology: superficial mycoses and dermatophytes).

BELÉM: *Museu Paraense Emílio Goeldi, (MG), Caixa Postal 399, 66000, Belém, Pará.*

Status: "Conselho Nacional de Desenvolvimento Científico e Tecnológico".

Foundation: 1866.

Herbarium: 685 specimens of fungi. (Main collectors: E. Ule, P. Hennings and E. Goeldi).

BELO HORIZONTE: *Faculdade de Medicina, Departamento de Microbiologia, Seção de Micologia, Avenida Alfredo Balena 190, Bairro dos Funcionários, 30000 Belo Horizonte, Minas Gerais.*

Status: Federal University of Minas Gerais.

Mycologists: FRANCISCO KASSAE MOREIRA (Medical mycology).

FUTIN SEBASTIÃO NOGUEIRA (Medical mycology).

LUIZ GONZAGA DE OLIVEIRA (Medical mycology).

MARIO BARBOSA (Medical mycology).

YASSEA KASSAE MOREIRA (Medical mycology).

BELO HORIZONTE: *Instituto de Ciências Biológicas, Departamento de Microbiologia, Avenida Alfredo Balena 190, Bairro dos Funcionários, 30000 Belo Horizonte, Minas Gerais.*

Status: Federal University of Minas Gerais.

Mycologists: MARIA APARECIDA DE REZENDE (M.Sc., Biochem. Pharm. Basic mycology: chromomycosis fungus physiology; industrial mycology: fermentation).

MAURICIO RESENDE (Veterinary mycology: bird and pig mycoplasmas).

The dollar figures represent expenditures in dollars. The
cruzeiro figures represent expenditures in cruzeiros.

A. <u>Equipment and supplies</u>	\$1000.00	<u>Cr83,964.00</u>
B. <u>Fuels</u>		Cr98,993.00
C. <u>Transportation</u>		Cr106,548.00
D. <u>Food</u>		Cr65,120.00
E. <u>Shipping</u>	\$330.00	Cr6,293.00
Cash advance for specimen shipments to USA	\$400.00	Cr14,320.00
F. <u>Equipment repair</u>		
(The total amount spent was Cr40,642 as per expenditures of Projecto Flora Technician Bruce Nelson. I have been credited only with a <u>refund of Cr2,718.00</u> of this amount. Receipts are enclosed in a claims report to Nelson -- copy enclosed.)		
		Cr20,321.00
G. <u>Services of Guides, Materios, etc:</u>		Cr11,156.00
H. <u>Miscellaneous</u>		
Port fees, Porto Trombetas (one-half)		Cr1,500.00

IV. Disposal of Expedition Equipment and Supplies.

Materials purchased for the 1980 Rio Trombetas Expedition remaining after the termination of the field work should be allocated by responsible Projecto Flora personnel to other expeditions. An exception is the microbiological equipment/supplies (agar, glass slides, cover slips, petri plates, two pressure cookers, etc.) which should be given to INPA Micro-biologist Dr. Mok for use in research analysis of soil samples collected on the expedition by Dr. Paul H. Dunn.

V. Commentary by the North American Leader.

I believe I reflect the attitude of all North American participants on the Rio Trombetas expedition in saying that, once the expedition was out of Manaus, underway and functioning on its own, the work was carried out relatively well by a very congenial, cooperative, compatible and adaptive group of Americans and Brazilians. C. A. Cid Ferreira performed admirably as Expedition Chief. His

leadership skills began improving early on. I recommend that Cid be given additional opportunity for growth and development of his manager/administrator potential.

I have developed strong feelings about several Projecto Flora issues and consequently the following comments and suggestions are intended as constructive criticism.

A. The Section 1 S requirement of Projecto Flora Memorandum of Understanding between CNPq and the National Science Foundation was clearly not met. The non-INPA participating Brazilians were not aware of and did not understand nor expect some of the requirements of this agreement. A serious expedition problem was the result.

I recommend for future Projecto Flora expeditions:

(1) A Portuguese language version of this MOU be signed by each Brazilian expedition member and his/her institutional supervisor and likewise that an English language version be signed by North American members and their institutional supervisors.

(2) A roundtable discussion of the MOU involving expedition members and INPA administrators who have Projecto Flora responsibilities should be held before the expedition leaves for the field. Before the departure of the 1980 Rio Trombetas expedition, contact between expedition members and INPA officials was noticeably nil.

B. I regret the dirth of bonafide Brazilian researchers as members of the 1980 Rio Trombetas expedition. A technical class of Brazilian participants was evident. I believe that the result was a prevailing emphasis on quantitative collection rather than one involving scientific quality as well.

I recommend for future Projecto Flora expeditions:

(1) The Expedition Chief and Brazilian Group leader as well as the American Group Leader, should be a practicing scientist rather than a Projecto Flora or INPA or other institutional technician or student.

(2) The North American Leader and the Brazilian Leader should mutually agree on expedition members and alternatives well in advance of the expedition start date.

(3) The designated expedition leaders should carry out their CNPq-NAF Memorandum of Understanding mandates, particularly those related to advanced expedition planning, rather than have these functions carried out mostly by INPA administrators and Projecto Flora technicians as it now seems to be done.

C. I have some particularly strong feelings concerning the Projecto Flora position now filled by Bruce Nelson and concerning Nelson's job performance.

The duties now being attempted by Bruce Nelson should be carried out by a person who can be regarded and accepted as a professional peer by CNPq, INPA and other Projecto Flora related personnel, including all expedition members of a bonafide research nature. This requires a botany PhD with a vested research interest and a proven insight into the requirements of tropical field work.

Bruce Nelson's apparent background does not qualify him for the job he is trying to do. His inexperience in tropical field work and other aspects of the Projecto Flora job he holds has been apparent. I also suspect that Nelson receives no effective performance review and that the prevailing impression of his work comes from his participation with Brazilian and North American researchers in field work in recent years, while he was a student.

My observations on Nelson come as a result of contact with him through correspondence and telephone conversations from the Natural History Museum in California, and during two weeks that I was in Manaus specifically for expedition planning and outfitting, prior to departure for the field. I also sought out the impressions of fellow expedition members on this subject.

Nelson carried out the activities I knew him to undertake with an uneven performance. The obvious and less important activities he does well. He can purchase hardware, arrange hotels and transportation and meet persons at the airport. He apparently converses well in Portuguese.

Nelson's inexperience is most apparent in fundamental areas such as knowledge of budgetary accountability, interpersonal relations, and organization and planning. He demonstrated a lack of insight into the requirements of expedition plant collection processing.

Most disconcerting was my experience that despite his level of experience Nelson sought unilaterally to impose his wants and, for me, conservative likes and dislikes on an expedition -- one on which he would not even participate. He also purported to represent the needs and expectations of North American expedition members with which he had no rapport and no equivalent field experience.

At risk of seeming trite, I provide details of a situation to illustrate my basis for some of these comments.

We were burdened with an unusual drying system of Nelson's design, one of which he was, "very proud". The system incorporated the conventional corrugate press system into wooden boxes whereby the press straps would be applied around the lateral sides of the box rather than tied directly around the corrugates interspersed with the specimens in paper. These drying boxes were not used as Nelson intended -- the corrugates with specimens were bound conventionally and dropped into the wooden box before placing over the heat source for drying. Dr. Christopher Davidson and I wished to try out the

drying boxes before we left for the field because of our unfamiliarity with Nelson's novel system and because no alternative conventional press arrangements would have been possible. I was negatively impressed with Nelson when he became incensed at our request to test his equipment. He became sullen and refused to assist us in locating gas, etc. for the trial.

A related matter was the availability of pressing equipment, aside from the clumsy and costly drying boxes of Nelson. I specifically expressed concern over having adequate drying facilities on the expedition. There would be five expedition members, assisted by two mateiros, making collections and in 11 of 12 duplicates. I expressed this concern from Los Angeles in letters and in telephone conversation with Nelson. I intended to provide corrugates, etc. from Los Angeles if needed. Dr. Davidson and I arrived in Manaus to find that Nelson was planning to outfit the expedition with two of his drying boxes -- the equivalent of only six feet of press. We went to the field with seven of the drying boxes which would give a capacity of 21 feet of press. However, only 15 feet was available in Manaus and Belem.

Large backlogs of collections quickly developed in the field from the collections obtained by several collectors in large numbers of duplicates. More press was requested.

The requested additional press materials arrived four months after my Los Angeles-based inquiry to Nelson in Manaus, after seven weeks into the expedition and after the departure of three very productive expedition members.

I recommend that Technician Bruce Nelson's activities be more limited to those less important details he does well. He should be given close supervision by Brazilian and American Projecto Flora officials. He should not carry out functions prescribed in the MOU as the duty of the Group Leaders. He should not select expedition members. He apparently cannot be depended upon to inform expedition members of expedition requirements. He cannot effectively communicate and carry out planning with North American participants for a large expedition. (Nelson complains about contradictory information which comes with consistency from New York.) Nelson should be eventually replaced by a responsible scientist with proven field experience and the proper stature and peer status.

On behalf of the North American Group, I say thanks to those who have made Projecto Flora possible and for the opportunity to participate on the 1980 Rio Trombetas Expedition. We all look forward to working with the specimens we have collected and to producing the technical reports that will follow.

cc: Dr. G. Prance

Saboaraua - *Swartzia laevicarpa*
 Angelim rajado - *Pithecolobium racemosum*
 Sucupira preta - *Diploporis* sp.
 Sucupira amarela - *Hymenolobium* sp.
 Açuano - *Swietenia macrophylla*
 Jacareuba - *Callophyllum brasiliensis*
 Cedro - *Cedrela odorata*
 Virola - *Virola purinamensis*
 Copaibaraue - *Copaifera* sp.
 Jouro inamui - *Ocotea barcelensis*
 Cardeiro - *Scleroneura micranthum*
 Muratinga - *Olmediperebea* sp.

From Dr. William Rodrigues

INPA 8-XI-1965

List of woods most commonly used for plywood
in Amazon.

LIST OF WOODS

FOR Plywood

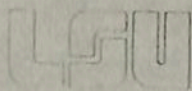
AMAZONAS

Dr. William

INST. DE PESQUISAS TECNOLÓGICAS
BOLEIM Nº 46

NO BRASIL. São Paulo.

DR. PEIXEIRAS MATEIAS DE CAMARGO



Montee Ballot

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

July 16, 1980

Office of the Clerk of Court
P.O. Box 1992
Baton Rouge, LA 70821

Dear Sir:

This is to request that I be sent an ABSENTEE BALLOT FOR
THE NATIONAL ELECTIONS TO BE HELD ON NOVEMBER 4, 1980.

Reason for absence: I will be on a botanical research project in
Brazil from September through December, 1980.

Home Address: 622 Castle Kirk, Baton Rouge, LA 70808

Foreign Address: c/o INPA - Botanica
Caixa Postal 478
Estrada do Aleixo km 4
69.000 Manaus, Amazonas
BRAZIL

Ward: 1

Precinct: 76A

Party Affiliation: Democrat

Since mail to Manaus, in Amazonian Brazil, is sometimes delayed,
kindly send me the ballot via airmail at the earliest possible date.

Thank you for your cooperation,

Sincerely yours,
B. Lowy
Bernard Lowy
Professor of Botany

XVI. THE STATE OF AMAZONAS

This is an immense, trackless stretch of flat land thickly sown with an impenetrable virgin forest that literally teems with poisonous insects, while the climate is one of the deadliest in the world. Threaded by great rivers which provide the sole means of access, the State of Amazonas might be termed a "forest wilderness". Brazilians call it the "Green Hell". Except for an occasional Indian tribe and an occasional mission, and except for the city of Manaus itself, no sign of human life is to be found anywhere hereabouts.

A few bold pioneers, nevertheless, have tried their luck in Amazonas, tempted by the extraordinary natural wealth of the region: various types of precious wood and above all *Hevea*, the rubber-yielding tree. A good many of them have succeeded remarkably and even struck it rich, thanks to an enterprising spirit, indomitable energy and—most important of all—an iron constitution.

But let there be no mistake: Amazonas is not for the casual tourist. Unless he has a keen taste for "roughing it" in the jungle, and unless he is prepared to undergo special training and organize nothing less than a full-scale expedition, no traveller can penetrate the forests of the Amazon and live to tell about it. Blazing a trail through the jungle has this in common with mountain-climbing: it is a pastime reserved for hardened specialists, for born adventurers. The casual tourist had best give it a wide berth.

MANAUS

Capital of the State of Amazonas, Manaus occupies an eminence on the left bank of the Rio Negro 7 miles upstream from its confluence with the Amazon. Manaus is the hub of all the productive activity of the Upper Amazon. The climate is very hot (mean annual temperature: 77°F.) and very humid. A modern city, Manaus forms an isolated island of humanity in the middle of the wilderness, its sole links with the outer world being by boat or plane. Excellent river harbour. Population: 140,000.

History

Like all the towns of Amazonas, Manaus grew up round a Portuguese outpost Fort São José, built in 1669 by Francisco da Motta Falcão, one of the great trail-blazers of the Amazon country. The town, however, only came into being about two centuries later.

From 1500 to 1852 the Amazon country was an adjunct of the province of Pará whose capital was Belém. On March 3, 1755, what is now the State of Amazonas

A Jungle City's Hour of Grandeur

By EDWIN McDOWELL

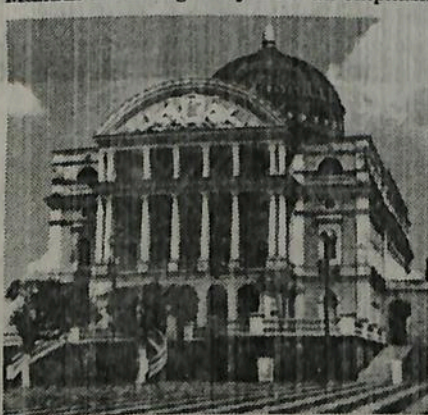
MANAUS, Brazil — A thousand miles upriver from the Atlantic Ocean, a city appears without warning in the midst of the vast tropical rain forest.

The city is Manaus, a port situated on the left bank of the Rio Negro a dozen miles above where its inky waters flow into the Amazon River. It is 500 miles in any direction from another settlement that can even be called a city. Until it was linked to the Trans-Amazon Highway in recent years, this was said to be the only state capital in the world inaccessible by road.

Yet with a population estimated at about 350,000, Manaus is home to almost one-third of the population of Amazonas State, an expanse larger than France, Spain, Italy and Greece combined.

Moreover, isolated Manaus enjoys a relatively wide range of social and cultural advantages. It boasts one of the most modern airports in South America, two fine hotels, broad streets, handsome parks, large public squares, a university, several public libraries, a dozen hospitals, even TV stations.

Now that the Amazon valley is slowly being criss-crossed by a network of roads, Manaus is turning away from an emphasis



on commerce (the government designated it a free trade zone in 1967) to an emphasis on industry. Therefore the city promises to play an even more important role in the development of the Amazon basin.

But promises have a way of evaporating in the tropical heat, where nature and circumstance have often combined to thwart optimistic predictions. And no people have greater cause for skepticism than residents of this unexpected jungle oasis.

For early in this century, Manaus (until 1946 it was spelled Manaos) was the commercial epicenter of the brief but frenzied rubber boom, that tropical version of gold fever and the Klondike stampede. During that time the somnolent river city was the terminus of a great flotilla that sailed upriver crammed with bold adventurers

hopeful of making a fortune through means legal or illegal.

For several decades this rubber capital throbbed with excitement. As world-wide demand for rubber grew, so did its popula-

Early in this century, Manaus was the commercial epicenter of the brief but frenzied rubber boom, that tropical version of gold fever and the Klondike stampede.

tion—from a few thousand in 1850, when some 1,500 tons of rubber were exported from the Amazon, to about 40,000 by the turn of the century, when the Amazon exported 20,000 tons of rubber a year. By 1910, when rubber brought an all-time high of almost \$3 a pound, the population had soared to 65,000.

Many newcomers, especially the entrepreneurs, came from the four corners of the earth. But most new arrivals were "flagelados," wretched refugees from the drought-stricken backlands of Brazil's parched, impoverished northeast. Some 200,000 of these gaunt exiles poured into the Amazon between 1870-1910, seeking escape but finding mostly fever and disease.

Meanwhile, Manaus was undergoing a startling transformation, financed from taxes as high as 30% on rubber exports. Its dusty streets were widened and paved. It was the second city in all of Brazil to be illuminated by electricity. Lights from many of its 6,000 private houses shimmered eerily across the jungle darkness.

At a time when horse-drawn streetcars still wended their way through large U.S. cities, electric trolley cars traversed the streets of Manaus, winding through suburbs with tiled mansions and lush gardens that were often scenes of Gatsby-esque parties.

Everything about this "Paris of the Jungle" had an air of unreality. Rubber barons kept race horses on palatial properties. An orchestra serenaded the evening in the public garden. Women gussied up in the latest European fashions and men decked out in white suits provided a splendid sartorial touch to the tropics.

The city boasted hospitals, an asylum, a leper colony and venereal disease clinic, a school for orphan girls, a university, a 10,000-volume public library, even a meteorological observatory. The handsome Palace of Justice was built of white marble. Even the state penitentiary was modern and attractive. The upper class vacationed in Europe and sent children to fashionable schools abroad.

This cosmopolitan city, according to his-

torian E. Bradford Burns, boasted more movie and entertainment houses proportionally than did Lisbon or Rio. Lectures, drama and poetry groups, art exhibitions and musicales enhanced the cultural climate. Gambling and prostitution also flourished; a well-known brothel operated not far from the governor's mansion. La dolce vita was alive and well in the middle of the jungle.

Perhaps the most striking monument to conspicuous consumption in this city, which famed Brazilian sociologist Gilberto Freyre described "as artificial as a set of solid gold teeth on a bushman still prepared to eat raw snake," was its ornate opera house, Teatro Amazonas. Completed in 1896 after 15 years at a cost of over \$2 million, this jungle Xanadu still sits atop its lofty perch overlooking San Sebastian square, the equatorial sun sparkling on the 40,000 blue, green and gold tiles of the cathedral-like pleasure-dome.

The colored tiles represent Brazil's national colors. But neither the state nor the rubber barons spared any expense to give the pink and white theater an international flavor and to make it a worthy rival of the Paris opera house. They ordered pink pavement stones from Portugal, iron framework from Scotland, the cupola's ceramic tiles from Alsace, marble staircases and columns from Italy, hand-wrought cast iron from England, chandeliers from Venice. They imported the finest tapestries, carpets, porcelains and sculptures. The four ceiling murals were painted on canvas in France.

Objects were not the only imports; several hundred artists, architects, sculptors and artisans came from Italy, France and Portugal.

Sarah Bernhardt and Anna Pavlova never performed at Teatro Amazonas, as is frequently claimed. Neither did Enrico Caruso sing there on opening night, Dec. 31, 1896, as the Encyclopaedia Britannica says. But not because their asking price would have been out of reach. Here, where the cost of living was among the highest in the world—several times that of New York City, for instance—the state treasury generously subsidized the tropical theater. The Comedie Francaise performed here, as did Italian tragedian Giovanni Emanuel, who specialized in Shakespearean drama.

Nevertheless, few prominent artists were willing to journey into the jungle thicket, and no wonder. It was an arduous trip, and in 1900 nine members of an Italian opera company died here of yellow fever. In fact, from 1903 to 1912 Manaus averaged more than 100 deaths a year from yellow fever, with a record 210 deaths in 1911. Only adventurers blinded by visions of wealth and glory risked those formidable odds.

Bideu Sayão did sing here

Mr. Wickham's Role

But even as Manaus raced toward prosperity, eventual ruin was in the making 500 miles downriver, near Santarem. There, a London-born planter, Henry A. Wickham, had spirited some 70,000 rubber seeds aboard a ship bound for England. That was in 1876. So confident was Brazil of its rubber monopoly that it had not bothered to prohibit the export of rubber plants or seeds. By the time it bestirred itself sufficiently to impose even a modest tax on rubber seed exports, in 1884, it was already too late. For in that year planters in Ceylon and Singapore, in whose botanical gardens the germinated seeds were transplanted, began tapping the trees for latex.

In 1910 Brazil supplied more than 85% of the world's rubber. By 1915 two-thirds of the rubber entering the world market came from the East Indian plantations, whose production costs were less than half that of Brazil's. Prices plunged and in Manaus the panic was on.

Before long the exodus from Manaus was in full flight. Profiteers, dandies and coiffured ladies booked passage for Europe and elsewhere. Merchants who had only recently catered to the carriage trade were hurtled into bankruptcy. Elegant salons no longer entertained witty conversation. Grand pianos fell silent. Tropical rain beat against abandoned homes and stables. Schools closed, public employes were laid off. One veteran traveler to South America wrote in 1928 that Manaus "once possessed a fine zoological park, but becoming financially depressed, it had to feed the smaller animals to the larger until only the biggest jaguar remained," which was set free.

A Rejuvenated Dowager

As for Teatro Amazonas, once the curtain rang down upon the region's Theater of the Absurd, it lapsed into obscurity. The dowager queen received modest face lifts in 1929 and 1962, but the tropical heat and humidity had taken too great a toll. Two years ago, however, the 800-seat theater received an expensive major overhaul: air conditioning, new acoustics, modern sound and lighting equipment. Paintings, murals, staircases, furniture, the mosaic floor and the main proscenium canvas were all restored to their original luster. Damaged tiles were replaced with colored glass.

It is once again a lovely theater, two or three times a week offering folklore shows or plays that were popular in Rio or Sao Paulo some months earlier. Margot Fonteyn danced here last year; her toe shoes are on display in the upstairs private museum, along with ornate spittoons of fine china and other remembrances of the theater's grandeur.

And late at night, after the curtain has rung down and the applause died away, the elegant, empty auditorium echoes to the sounds of another age, a dazzling moment when this audacious, improbable jungle city strutted its hour upon the world's stage.

Mr. McDowell is a member of the Journal's editorial page staff.

evidence for the precise location of the sperm enzymes or lysins responsible has not been forthcoming. Even though the localization of the protease in the acrosomes of the sea urchin sperm had been reported (19), the accompanying fluorescent photomicrographs did not confirm this observation. Indeed, the fluorescence can be observed over the entire sperm nucleus. The biochemical work of Levine *et al.* (8) does show a good correlation between acrosomally reacted sperm (as judged by light microscopy) and activity of a trypsin-like protease. Levine *et al.* were able to show strong inhibition of fertilization of eggs with reacted sperm given preliminary treatment with either PMSF (phenylmethanesulfonyl fluoride) or DFP (diisopropyl fluorophosphate), two serine protease inhibitors. Their use of the well-known trypsin substrate BAEE, and our ferritin labeling with soybean trypsin inhibitor indicate that the protease in question is related to trypsin. Hoshi *et al.* (20) have shown inhibition of fertilization in sea urchins by chymostatin and TPCK (L-1-tosylamide-2-phenylethyl chloromethyl ketone), which are chymotrypsin-specific inhibitors, and NPGB (*p*-nitrophenyl-*p*'-guanidino-benzoate) which inhibits both trypsin and chymotrypsin; but trypsin-specific inhibitors were ineffective. Hoshi *et al.* believe that a chymotrypsin-like enzyme is involved in sperm penetration of the vitelline coat. However, since their work consisted of inseminating eggs in the presence of the inhibitors, it is difficult to evaluate whether the inhibitors were acting on the sperm, the eggs, or both. At present, both trypsin- and chymotrypsin-like enzymes in the acrosomes cannot be ruled out.

Our study leaves open the question of the role of such sperm enzymes in fertilization. The protease appears to be located at the tip of the acrosomal tubule indicating a possible role in the dissolution of the vitelline coat (21), but numerous experiments with SBTI [see (22) for review] show that fertilization does occur in the presence of some trypsin inhibitors. Another possibility, as previously pointed out (8), is that the enzyme may function in the acrosome reaction itself. This would not be surprising, as phospholipase activity has been reported in sea urchin sperm (23). If phospholipase mediates gamete membrane fusion as suggested (23), or acrosomal vesicle dehiscence in the initial stages of the acrosome reaction, a trypsin-like enzyme may activate the phospholipase (22), as can occur with mammalian pancreatic trypsin in the digestive tract (24). Another possibility for the role of the

protease is the modification or deposition (or both) of bindin on the extruded acrosomal tubule. Now that the protease has been definitively localized on the acrosomal tubule of *S. purpuratus* sperm, the function of the enzyme can be further investigated.

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Intrafloral Pollen Differentiation in the New World Lecythidaceae, Subfamily Lecythidoideae

Abstract. *Floral biology, pollen germination, and scanning electron microscopy studies have indicated different types of pollen within the same flower in at least two species of New World Lecythidaceae, subfamily Lecythidoideae. Two types of pollen are produced in different parts of the androecium and serve different functions. One type attracts pollinators by providing a reward, and the other functions in fertilization. The former type has lost its ability to germinate, at least under in vitro conditions.*

The Lecythidaceae or Brazil nut family is pantropical in distribution (1) and consists of four subfamilies, 20 genera, and 278 species. However, in the New World subfamily Lecythidoideae, consisting of ten genera and about 206 species (1), an adaptive radiation of the androecium has occurred in response to animal pollen vectors.

In the Lecythidoideae, the structure of the androecia ranges from symmetrical with many stamens and no nectar to asymmetrical with fewer stamens and with nectar. The least complicated androecial type is found in *Gustavia*, *Grias*, and *Allantoma*, which have symmetrical androecia with many stamens

that are fused at their bases into a ring (Fig. 1A). In *Couroupita*, *Lecythis*, *Couryphora*, *Bertholletia*, *Eschweilera*, and *Couratari*, the ring is prolonged on one side into a straplike structure that arches over the summit of the ovary (Fig. 1, B to E). This structure consists of the ligule, a stamen-free area adjacent to the staminal ring, and the hood, a distal portion with variously modified appendages. The hood may be open or tightly appressed to the summit of the ovary.

The intricate hood-ligule structure of asymmetrically flowered Lecythidoideae encourages pollination in the following ways: (i) nectar or pollen, which attract

pollinators, is produced in the hood; (ii) the hood serves as a landing platform for pollinators; and (iii) the hood-ligule acts as a spring that forces the pollinator's back against the staminal ring and thereby ensures the deposition of the pollen in the proper position. In addition, in species with tightly appressed hoods, only insects with enough strength to force the hood open can enter the flower; the hood thus protects the flower's nectar and pollen from other insects. In all species of Lecythidoideae the style is situated in the center of the doughnut-shaped staminal ring (Fig. 1, A, B, and F).

Observations of pollination (2) indicate that flowers of species of Lecythidoideae with symmetrical androecia are visited by many different species of bee, whereas flowers having androecia with flat appressed hoods are usually visited by short-tongued bees that collect pollen but not nectar from the hood. Flowers with zygomorphic androecia with coiled appressed hoods are visited only by long-tongued bees that collect nectar from the apex of the coil, and at least one species with zygomorphic flowers and flat hoods, *Lecythis poiteauii* Berg, is visited by bats. In general, the more specialized the androecium the more specialized the pollinator that visits the flower.

Both *Lecythis pisonis* Cambess. and *Couroupita guianensis* Aubl. have zygomorphic androecia, flat hoods with antheriferous appendages, and no nectar. Their androecia differ in that the hood of *L. pisonis* is appressed to the staminal ring whereas that of *C. guianensis* is open.

Observations of the crown of *L. pisonis* made in southern Bahia, Brazil, have indicated that *Xylocopa frontalis* (Oliver) (3) is the only bee that enters its

flowers (4). This bee lands on the hood and enters the androecium with its back and head against the staminal ring (Fig. 1F). It removes pollen from the anthers of the hood and places it among the hairs on its legs. At the same time pollen from

the staminal ring is deposited on the back and head of the bee. When the bee visits another flower it carries staminal ring pollen in the proper position to be deposited on the stigma.

The petals and androecium of *L. pi-*

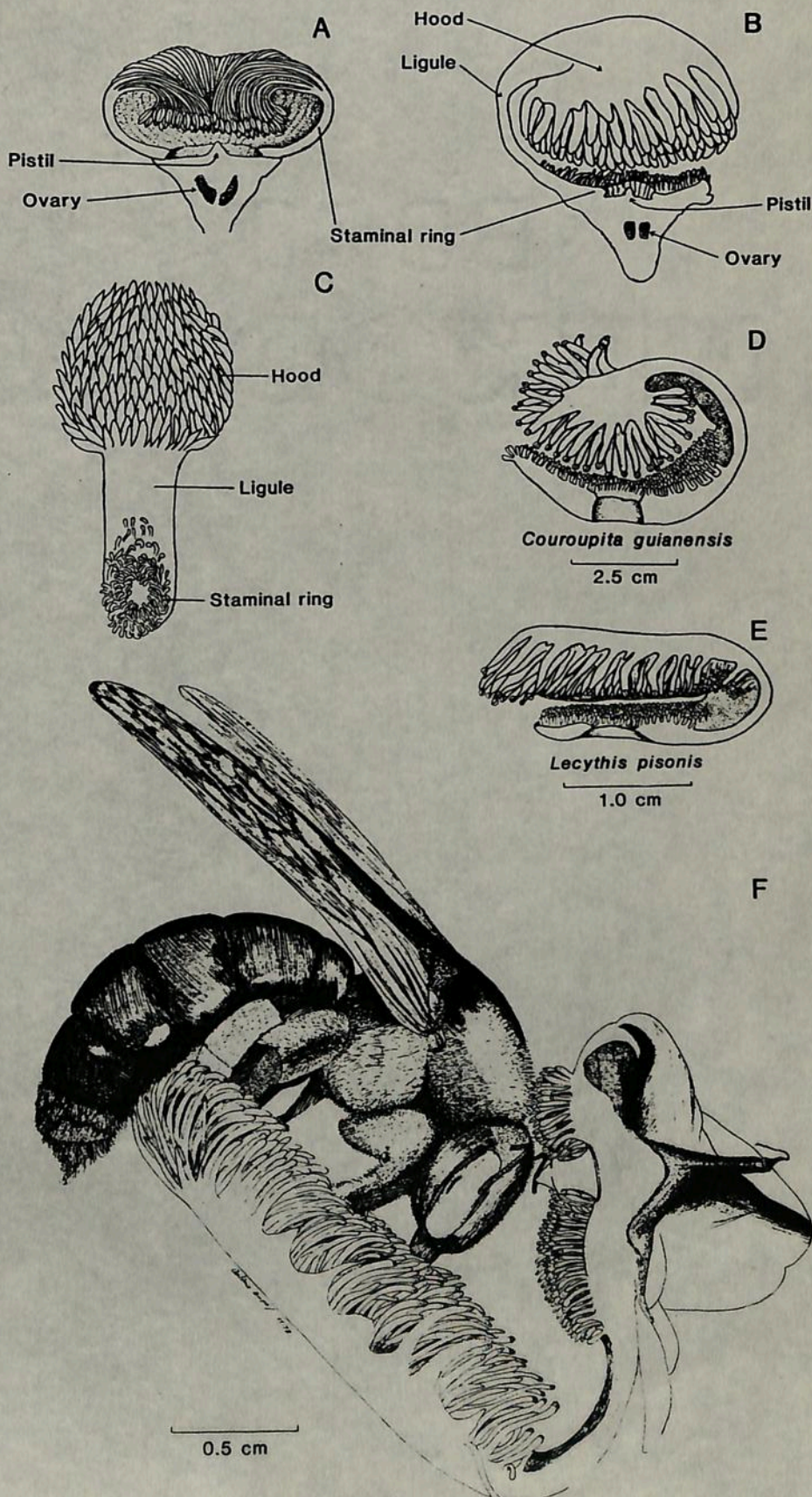


Fig. 1. Androecium types of New World Lecythidoideae subfamily Lecythidoideae. (A) Medial section of the symmetrical androecium of *Gustavia* showing the anthers fused at their bases into a ring. (B) Section of the asymmetrical androecium of *Lecythis* showing the ring expanded on one side into the straplike ligule and the expanded distal portion called the hood. Nectar is produced at the base of the sterile hood appendages. (C) Intact asymmetrical androecium removed from the ovary, opened up, and viewed from above. (D) Medial section of the androecium of *Couroupita guianensis* Aubl. The hood stamens bear anthers but no nectar. (E) Medial section of the androecium of *Lecythis pisonis* in which the hood stamens also bear anthers. (F) The carpenter bee *Xylocopa frontalis* collecting pollen from *Lecythis pisonis*. The head and back of the bee are forced by the androecium structure to touch the anthers of the staminal ring and the stigma thereby facilitating cross pollination when it visits another flower.

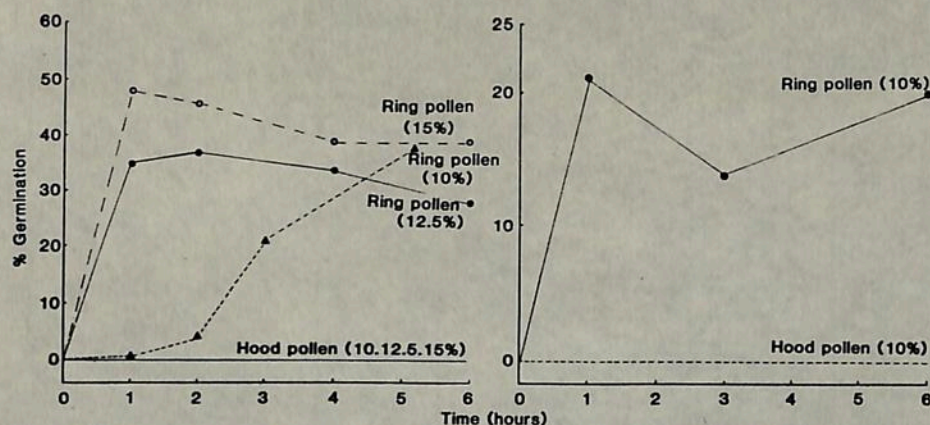
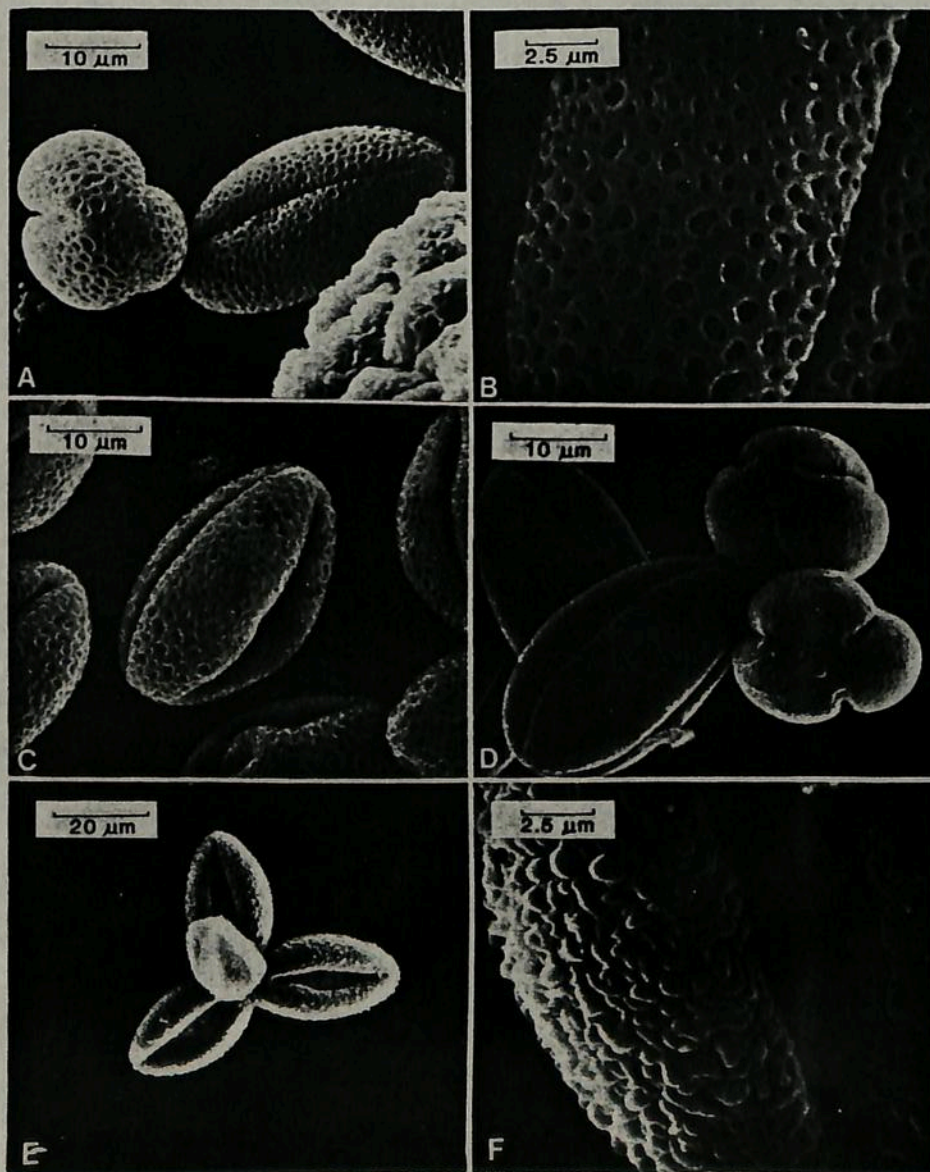


Fig. 2. Germination of the two types of pollen of *Lecythis pisonis* Cambess. (left) and *Couroupita guianensis* Aubl. (right). Pollen from the staminal ring and the hood of five flowers of each species was removed and separately placed in solutions of sucrose (concentrations of 10, 12.5, and 15 percent), 0.1 percent yeast, and 0.1 percent boric acid. At hourly intervals for *L. pisonis* and intervals of 1, 2, and 3 hours for *C. guianensis*, 0.005 ml of each of the solutions was removed and the number of grains with pollen tubes appearing at a magnification of $\times 125$ was registered. If fewer than 25 grains were present, another field was selected until at least 25 grains were counted. The total germination for all five flowers of each type of pollen in each solution is given. In both species no germination was observed in hood pollen, whereas at least some ring pollen had germination in all concentrations at all time intervals. Numbers in parentheses refer to sucrose concentrations of the media.



sonis, upon opening at daybreak, are purple. By the next day their color is less intense, and 48 hours later, when they have fallen from the ovary, they are white. The pollen from both the staminal ring and the hood of freshly opened flowers is yellow. After 24 hours the remaining pollen of the hood has turned black, whereas that of the staminal ring is still yellow. This differential color change indicates a physiological difference between the two pollen types. Further evidence of pollen differentiation comes from studies of germination in vitro. Pollen from the hood of *L. pisonis* did not germinate under experimental conditions, whereas up to 48 percent of the grains from the staminal ring germinated (Fig. 2). Scanning electron microscopy of ring and hood pollen of *L. pisonis* indicates no readily distinguishable morphological differences between the two types of pollen (Fig. 3).

The dimorphic nature of the pollen of *Couroupita guianensis* was pointed out by Jacques (5). We have established that there is a physiological difference between the pollen types and that there are at least two species in two different genera with pollen differentiation. We studied the pollen of *C. guianensis* from trees cultivated in Ilhéus, Bahia. Although we have no pollination data for this species, the large size of the flower and its nocturnal opening (6) suggest that bats may be the pollinators. Pollen of *C. guianensis* was removed from the hood and ring and placed in the germination media. No grains from the hood were observed to germinate, whereas up to 21 percent of the ring pollen germinated (Fig. 2). In addition, scanning electron microscopy indicated morphological differences between the two types of pollen. The pollen of the hood tends to remain in tetrads (7) and is rugose, whereas that of the staminal ring is separate and smooth (Fig. 3).

Although these experiments do not conclusively demonstrate that hood pollen from the two species does not germinate under natural conditions, they do

Fig. 3. Photomicrographs of hood and staminal ring pollen of (A to C) *Lecythis pisonis* Cambess. (voucher specimen, Mori 11069) and (D to F) *Couroupita guianensis* Aubl. (voucher specimen, Silva & Hage 200). (A) Ring pollen of *L. pisonis*. (B) Surface of a grain of ring pollen of *L. pisonis*. (C) Hood pollen of *L. pisonis*. (D) Ring pollen of *C. guianensis*; note the separate grains and the smooth surface. (E) Tetrad of pollen from the hood of *C. guianensis*. (F) Surface of a grain of hood pollen of *C. guianensis*. Note that the two types of pollen of *L. pisonis* are indistinguishable, whereas those of *C. guianensis* are morphologically distinct.

suggest that there is a physiological difference in the two types of pollen. This suggestion is supported by the differential color change verified in the two types of pollen of *L. pisonis* and by the observation that the bee *X. frontalis* collects only hood pollen from *L. pisonis*. In addition, ring and hood pollen of *C. guianensis* are morphologically distinct. Consequently, we suggest that pollen differentiation in these species of Lecythidaceae has evolved in response to different functions, that of the hood to attract pollinators by providing them with a reward and that of staminal ring to function in fertilization.

Dimorphic pollen has been reported in a number of plant groups (8), especially where heterostyly and its associated diallelic incompatibility occurs (9), as in *Linum* (10), *Waltheria* (11), and *Rubiaceae* (12). In these genera, both pollen forms are normally fertile. Dimorphy has been reported in a number of homostylous angiosperms such as *Silene alba* (13), *Utricularia flexuosa* (14), *Cuscuta reflexa* (15), and *Urena lobata* (16). Ong and Rao (8), in a study of the dimorphic pollen of six nonheterostylous species, found only one, *Brexia madagascariensis* (Saxifragaceae), that showed significant differences in germination between pollen morphs. The smaller pollen form showed no germination in vitro. In the above examples in which heterostyly does occur (9-12), the pollen is not produced from different parts of the androecium, as it is in the two species of Lecythidaceae. Therefore, our findings differ from those previously reported. Furthermore, the physiological difference in vitro in the pollen of the two Lecythidoideae studied is established.

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17. We are grateful to Yung-Chau Huang of the New York Botanical Garden for the preparation of the photomicrographs.

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Genesis of Petroleum Hydrocarbons in Marine Sediments

Abstract. Distribution patterns of isopentane and normal pentane in marine sediments show a reversal in slope at a subsurface temperature of about 90°C. The data indicate that three types of reactions are involved in pentane formation: (i) biological origin at the sediment surface, (ii) low-temperature (< 90°C) chemical reactions yielding predominately secondary carbon structures, and (iii) high-temperature (> 90°C) cracking reactions at great depth yielding predominately straight carbon chains.

Living organisms and Recent sediments contain a predominance of *n*-alkanes with odd-numbered carbon chains (1-3). For example, $C_{29}H_{60}$ composes 86 percent of the normal alkanes in apple wax, and over 90 percent of the normal alkanes in marine plants contain either $C_{15}H_{32}$, $C_{17}H_{36}$, $C_{19}H_{40}$, or $C_{21}H_{44}$. The biogenic origin of *n*-alkanes with odd-numbered chains causes these compounds to dominate mixtures of branched alkanes in surface sediments (3).

We have found that normal pentane is dominant over isopentane and neopentane in near-surface samples of Recent marine sediments. Also, the concentration of normal heptane always exceeds that of the methylhexanes. The evidence to date indicates that these *n*-alkanes, like the higher members, are of biological origin. They are believed to be biosynthesized in the organism or by low-temperature decarboxylation of even-numbered fatty acid chains (4). Normal pentane is present in concentrations of up to 5 ng per gram of sediment. The mole ratio of isopentane to normal

pentane in these sediments is generally less than 1 (Table 1). Most of the samples listed in Table 1 were obtained at sediment depths of less than 25 m with a gravity or piston corer. Nine other samples from the U.S. Gulf Coast, six from the Gulf of Maine, and one from Walvis Bay contained normal pentane but no isopentane.

In many areas, this ratio changes from a value of less than 1 to greater than 1 in the first 500 m of sediments, indicating that isopentane is being formed in larger quantities than normal pentane by low-temperature (< 50°C) diagenetic chemical reactions (5, 6). The formation of isopentane by microbiological reactions is considered unlikely due to the rapid decrease in microbial activity in fine-grained sediments after the first few meters. (Most of these sediments are fine-grained clays or carbonates.)

In the Black Sea, the mole ratio of isopentane to normal pentane in the free gas state is about 1 at a sediment depth of 300 m. We previously determined values for the mole ratio of these pentanes in the first 1050 m of Black Sea sediments

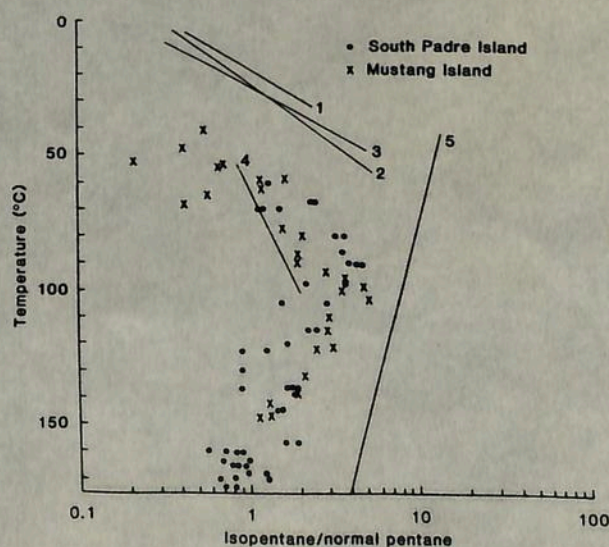


Fig. 1. Change in the mole ratio of isopentane to normal pentane with increasing subsurface sediment temperature. Lines 1, 2, and 3 represent Deep Sea Drilling Project holes 379, 380, and 381 in the Black Sea; line 4, the Paris Basin. Line 5 indicates the calculated equilibrium value.

Como a Hungria

Eis a nova dimensão dos parques nacionais

No meio do barulho que se faz em torno da necessidade de se defender a natureza, pouca gente notou que o general João Figueiredo já é o presidente que mais parques nacionais e reservas biológicas criou até hoje no Brasil. Se tais áreas funcionarem de fato como santuários ecológicos, esse mérito estatístico se somará ao mérito científico — e o país terá ganhado, pelo menos, os instrumentos legais para uma ação ecológica de envergadura. Na quarta-feira da semana passada, Figueiredo assinou decreto criando o 23.º parque nacional — o Parque do Jaú, no Amazonas, com aproximadamente 2,3 milhões de hectares, elevando a área de parques nacionais e reservas biológicas do país para 9,6 milhões de hectares, algo equivalente ao território da Hungria. Desse total, 7,3 milhões, ou mais de 80%, são obra do atual governo. O Parque do Jaú protegerá uma vegetação que em grande parte não foi sequer classificada pela



Botânica e uma riquíssima fauna, formada por espécies raras ou ameaçadas de extinção, como por exemplo o peixe-boi e a ariranha.

Segundo Maria Teresa Jorge Pádua, diretora de parques nacionais do Instituto Brasileiro de Desenvolvimento Florestal (IBDF), o desempenho do governo Figueiredo na área ecológica obedece a uma estratégia coerente. Até janeiro de 1985 deverão ter sido criados mais oito grandes santuários de flora e de fauna, a maioria na região amazônica: “Descobrimos que, se não fizéssemos esses parques agora, correríamos o risco de, dentro de pouco tempo, já termos os nossos

ecossistemas irremediavelmente alterados”, diz Maria Teresa.

Há razões para pressa. Dos 23 parques nacionais, apenas cinco estão de fato implanta-

dos, justamente os criados no atual governo. Para Maria Teresa, os dezoito parques que ainda esperam pela regulamentação representam “um enorme desafio”. Na maioria dos casos, suas terras continuam ocupadas por proprietários ou posseiros e o problema é conseguir uma verba estimada em 9 bilhões de cruzeiros para indenizar e tirar as pessoas dali. Em julho, cansada de esperar, a delegacia gaúcha do IBDF bancou de modo inédito o Parque Nacional de Aparados da Serra, criado em 1959 na divisa do Rio Grande do Sul com Santa Catarina — anunciando que pretende tirar de seu próprio orçamento, com prejuízo de todas as outras suas tarefas preservacionistas, o dinheiro necessário para implantá-lo. Só se espera que esse procedimento não se generalize. Afinal, cabe ao governo federal, que cria parques, a responsabilidade de consolidá-los.

VEJA. São Paulo. OCT. 1980.

Terras e bauxita do Jari com solução até final do ano

BRASÍLIA — A solução para o problema da jazida de bauxita de propriedade do norte-americano Daniel Ludwig — cuja operação de venda à Alcoa foi agora sustada — poderá ser anunciada até o fim do ano, juntamente com a solução para outro problema considerado importante por aquele empresário: o das terras do seu Projeto Jari.

A Secretaria-Executiva do Conselho de Segurança Nacional, de acordo com informações colhidas no Palácio do Planalto, já concluiu o exame das terras do Projeto Jari e vai levar ao presidente Figueiredo três opções para a decisão final dessa questão, que, segundo o próprio Ludwig, "tem se arrastado por cerca de quatro anos" e "provocado injustos e viciosos ataques públicos e políticos".

As fontes palacianas não quiseram antecipar quais são as três hipóteses de solução encontradas pelo Grupo Executivo para as Terras do Baixo Amazonas — Gebam — que a Secretaria Executiva do CSN constituiu para examinar o problema fundiário e de infra-estrutura governamental em toda a região em que se situa o Projeto Jari. Alegaram que o Presidente pode até não aceitar nenhuma delas e determinar outros estudos.

CAULIM

O deputado Hélio Duque

(PMDB-PR) denunciou ontem ao comentar a decisão do governo de suspender as negociações entre o grupo Ludwig e a Alcoa, em torno das reservas de bauxita localizada no Projeto Jari, que o empresário norte-americano Daniel Ludwig também já estabeleceu contatos para a conclusão da venda de 50 por cento das reservas de caulim do projeto ao grupo inglês de Mike Rolland.

Segundo o parlamentar, o Ministério das Minas e Energia não pode permitir a continuidade dessa negociação, "sem nenhuma consulta ou autorização oficial". A reserva de Caulim existente no Projeto Jari, disse Hélio Duque, é a maior do mundo. "Espera-se que nesse caso sejam fixadas regras que impeçam coisa semelhante ao que ocorreu com a venda da bauxita à Alcoa, quando até a anulação da concessão minerífera está sendo estudada a nível oficial".

Cals desmente ordem do CSN

BRÁSÍLIA — O ministro das Minas e Energia, César Cals, revelou ontem que um relatório que lhe foi enviado anteontem, pela Docegeol (Vale do Rio Doce Geologia), subsidiária da Companhia Vale do Rio Doce, denunciava com que a aquisição das reservas da Jari, a

Alcoa passaria a deter 900 milhões de toneladas de bauxita na região do rio Trombetas e não 500 milhões de toneladas como declarou a empresa.

O ministro desmentiu informações prestadas por sua própria assessoria e por fontes do Palácio do Planalto, de que a determinação para embargo das negociações entre a Jari e a Alcoa partiu do Conselho de Segurança Nacional. Desmentiu também declarações do representante da Alcoa em Brasília, Jorge Costa Neves.

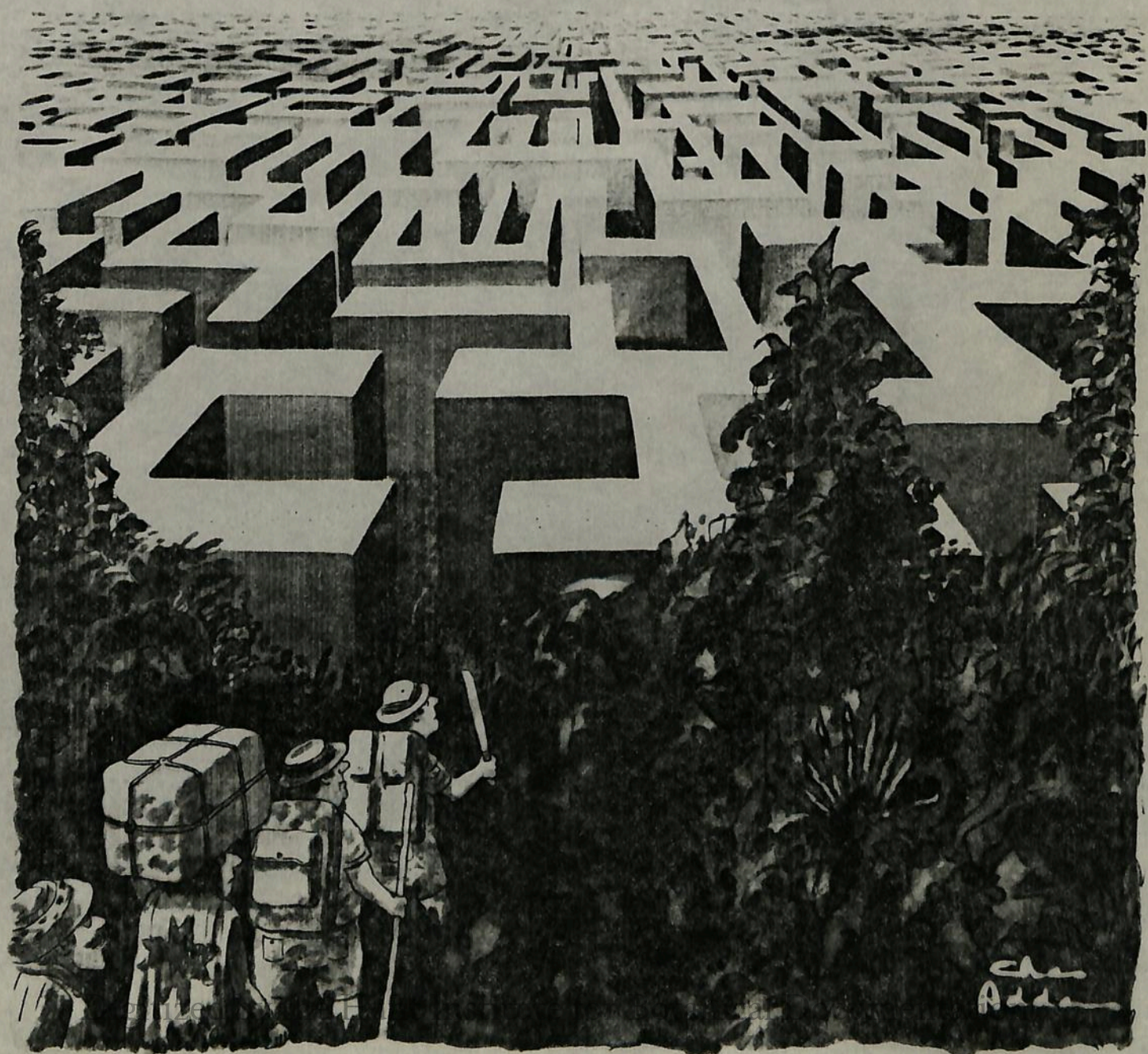
Reveleu também o ministro César Cals que o governo está estudando uma política específica para a bauxita. Disse que não tem sentido uma só empresa deter reservas muito grandes, que estenda para muitas décadas o horizonte de sua utilização face à demanda anual do projeto à que se destinam. Caso seja comprovado que a Alcoa passaria a deter 900 milhões de toneladas com a compra da jazida da Jari, as reservas de bauxitas da empresa representariam cerca de 23 por cento do total das reservas brasileiras. (4 bilhões de toneladas e seriam suficientes para que seu projeto de São Luís, operasse durante 100 anos. O ministro acha aceitável que a empresa detenha até 10 por cento do total das reservas nacionais, mas ressaltou que mesmo não sendo constatado que a empresa passará a ter 900 milhões de toneladas, a decisão sobre a autorização do negócio será de política de governo.

A Presidência da República decidirá sobre a questão da transferência das jazidas de bauxita da Jari para a Alcoa até o final do ano, anunciou-se ontem. E, além disso, será dada uma solução que envolverá, ao mesmo tempo, a questão de terras da Jari. Segundo as informações, há três alternativas a partir dos estudos propostos pelo Grupo de Terras do Baixo — Amazonas, Geban, designado pelo Conselho de Segurança Nacional para examinar a questão. Estas alternativas, entretanto, serão submetidas ao Presidente que escolherá uma delas — ou poderá, ainda, determinar novos estudos a respeito.

Por seu turno, o ministro das Minas e Energia, César Cals, negou ontem que, a decisão de sustar a venda das jazidas para a Alcoa tivesse partido do CSN, enquanto informava que a dimensão real da reserva não é de 500 milhões de toneladas, mas de 800. E o deputado Hédio Duque denunciava que há outra transação em vista na Jari: a venda, para um grupo inglês, das jazidas de caulim.

Em Belém, o deputado Oswaldo Melo fazia divulgar um relatório em que se questionam vários itens do projeto Carajás, na sua real dimensão, e, também, é denunciada a transformação porque passará São Luís, que comportará um gigantesco distrito industrial englobando siderúrgica e o complexo da Alcoa. (Pag.8)



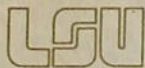




IN THE HEART OF THE FOREST a shallow stream tunnels its way through luxuriant walls of swamp vegetation. Here, in the dry season, the current flows

gently, spanned by a broken branch to which there clings a bromeliad, one of the many air plants that flourish in the soilless crannies of fallen logs and living trees.

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Botany

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Manaus Opera House at night



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脂香隱約透紅袖
 清影依稀入畫樓
 丁巳仲夏
 吳昌碩畫

