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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.

# FLORISTIC INVENTORY OF THE TROPICS: WHERE DO WE STAND?<sup>1</sup>

GILLEAN T. PRANCE<sup>2</sup>

In a review of the vast topic of the inventory situation in the entire tropics I can only skim over the surface. I have aimed to pinpoint a few of the significant contributions (many other important ones are omitted) and to draw attention to some of the areas in need of further work. These include both geographical areas that are poorly collected and disciplines which are still neglected in our basic survey of the fascinating vegetation of the tropics. There is still a great deal to be done and time is running out as the natural vegetation is being destroyed. Brazier et al. (1976) said: "More efficient use of the natural tropical forest could be achieved if sufficient information on the extent, composition and structure of the resources were available."

The data which we collect from botanical inventory are not only useful for the study of floristics and evolution, but are also of vital importance for both conservation and utilization of the tropical vegetation.

## OF WHAT ARE WE MAKING AN INVENTORY?

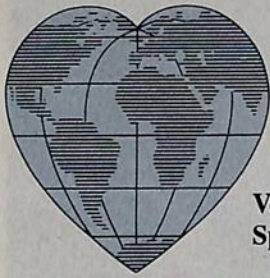
Table 1 gives a summary of the estimated number of species in the different major plant groups, compiled from the best available sources. The tropical flora consists of some 155,000 species of flowering plants, 11,000 ferns and fern allies, 16,000 bryophytes, and at least 90,000 fungi. The tropical flora is by far the richest in species diversity, yet it is also the most poorly collected. This diversity is being reduced before we have made an adequate basic inventory let alone conducted modern biosystematic and population biology studies in the area. Even to understand the origin and dynamics of our temperate flora, it is essential to have adequate knowledge of the tropical flora from which the temperate flora was derived.

Tropical Africa has the smallest number of angiosperm species, 30,000, including various islands and the 10,000 species of Madagascar (Koechlin, 1972). Tropical Asia, Australia and the Pacific have at least 35,000 species, and tropical America has about 90,000 species or 37.5% of the worldwide total. Unfortunately, the state of knowledge of these floras is also inversely proportional to the species diversity, with the American tropics much more poorly known than the African and Asian tropics.

In any discussion of inventory of the tropical flora it is important to consider habitat diversity and species diversity. We tend to ignore the habitat diversity of the tropics which contributes to its species richness, and to think of it as one

<sup>1</sup>I am grateful to the many people who have helped to provide information about the areas of their specialty especially to Mr. F. N. Hepper, Drs. F. R. Fosberg, M. Jacobs, Alain Liogier, W. Meijer and A. Gentry. I thank Mr. W. C. Steward for much bibliographic assistance, Mrs. F. Maroncelli who typed the manuscript, and Drs. Howard Irwin and Scott Mori for reading the manuscript critically.

<sup>2</sup>The New York Botanical Garden, Bronx, New York 10458.



# Better World

Volume 6, Number 1  
Spring, 1990

# Letter

ENCORE -  
**VOICE OF THE AMAZON**  
April 22, 1990  
6:00PM EASTERN ON TNT  
3:00PM PACIFIC  
TURNER NETWORK TELEVISION

## Chico Mendes: Voice of the Amazon Broadcast in Brazil

### Better World Launches in Brazil

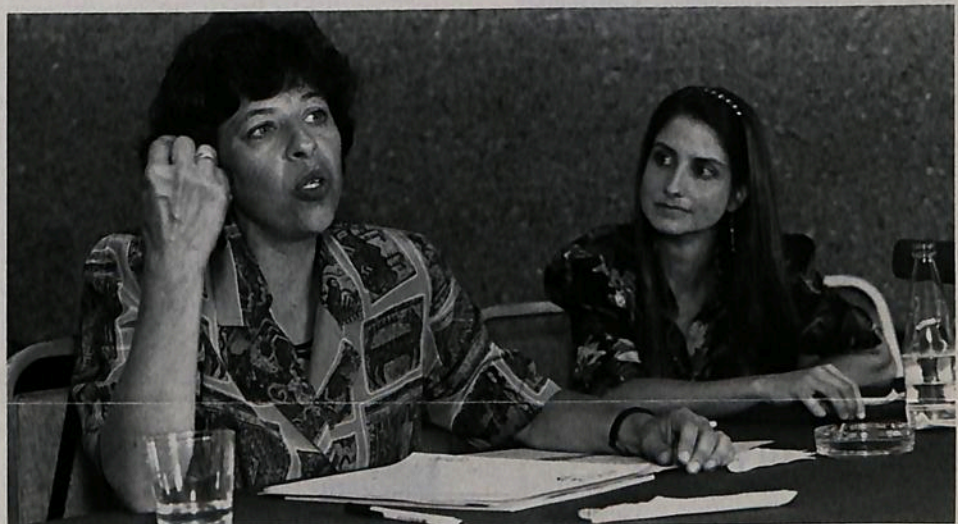
Brazil enters the 1990's as a nation of contrasts...

The world's eighth largest economy, with tens of millions of its citizens living in extreme poverty. A nation with an incredible wealth of natural resources, yet struggling to build a dependable infrastructure and meet the most basic human needs. The country is a target of worldwide criticism from environmentalists concerned about rainforest destruction, yet host in 1992 to the global environmental conference that will review the state of the planet twenty years after the 1972 Stockholm convocation which launched the international environmental movement.

Brazil is also a nation offering special opportunities to advance the Better World agenda, especially our environmental concerns. The first popularly elected President in 25 years, Fernando Collor de Mello, takes office in Brazil on March 15. He has issued an impressive environmental platform. Brazilian environmentalists are cautious, but hopeful... at least they see the opportunity to hold Mr. Collor accountable for specific pledges. Mr. Collor is clearly aware that world attention is focused on Brazil and its handling of the environment, especially the Amazon rainforest, and that this attention will intensify as the 1992 world environment conference approaches.

These are the circumstances in which Better World is beginning major, sustained activities within Brazil. During two trips to Brazil over the last year, BWS Executive Director Tom Belford prepared the necessary groundwork.

Better World met with each of the ma-



Mary Allegritti, President, Institute of Amazonian Studies and Miranda Smith, Filmmaker, at BWS Press Conference in Brazil.

...jor television networks in Brazil. So far, five networks have indicated interest in televising BWS programs, and even co-producing programs for Brazilian and international distribution. Given Better World's focus on television, securing this positive response from Brazilian networks is crucial to our future success.

Indeed, Better World's first Brazilian telecast occurred on February 8, when TV Manchete broadcast Chico Mendes: Voice of the Amazon, our hard-hitting documentary on the assassination of the Brazilian rubber tapper, ecologist and union organizer who won Better World's 1987 Environment Medal. The Brazilian press attention to this nationwide telecast was enormous and supportive.

Fernanda de Barros e Silvo, writer for Folha De São Paulo (leading Brazilian newspaper) says in his review of Voice of the Amazon, "the program directed by Miranda Smith and recently aired on North-American TV avoids an idyllic vision of the Amazon, is informative, and touches

on the main issue. That is why it is also touching."

In meetings with TV Manchete, the next steps in our Chico Mendes Campaign were planned, including grassroots distribution of the Portuguese version of Voice of the Amazon, as well as broadcast of a BWS commercial seeking public support for Brazil's National Council of Rubber-tappers.

We are confident that if a controversial BWS program like Voice of the Amazon, which is critical of Brazil's rainforest and human rights situation, can be telecast nationwide, future BWS projects will be shown without difficulty.

Recognizing the importance of building a Brazilian base for maximum BWS credibility and impact, we have begun to form a BWS Brazil Leadership Council. At a February 7 press briefing in São Paulo, Tom Belford and Rubens Vaz da Costa, BWS Board member from Brazil, announced the first members of the Council.

Continued on Page 3

## BWS President Attends Forum

Better World's President, Dr. Glenn Olds, recently attended the Global Forum on Environment and Development for Survival. The Forum, hosted and addressed by President Mikhail Gorbachev, was held January 12-19 in Moscow with representatives from the parliamentary, religious and scientific communities. Discussions involved the gravity of global environmental crises and the planet-wide strategies necessary to address these problems.

Several Better World Board members attended the Forum. Along with Dr. Olds, Georgiy Arbatov was present. Board members participating as speakers to the Forum were Lester Brown of the Worldwatch Institute, former Norwegian Prime Minister Gro Brundtland, and Mrs. Victoria Chitepo, Zimbabwe's Environment Minister. BWS Leadership Council member James Grant, Director of UNICEF, also addressed the Forum.

Parliamentary discussions yielded sev-



Dr. Glenn Olds, Sen. Claiborne Pell (D-RI) and The Very Rev. James P. Morton, Dean, Cathedral of St. John the Divine, New York, at the Global Forum on Environment and Development for Survival in Moscow.

eral proposals including allocation of defense spending cuts from the US and Soviet Union for research on solutions; strengthening the UN peacekeeping function; and new incentives for countries to increase their resolve to decrease population growth rates and increase innovations in renewable resources.

Sessions devoted to the religious involvement in environmental problem-solving proposed enlisting all religious

groups in support of earth stewardship through a variety of programs.

Scientific leaders conferred on ideas to increase research and development in new technologies that can help mankind reach its goals for a safe, sustainable planet. A diverse list of national and international scientific institutions, colleges and universities, and the United Nations would be enlisted and funded in order to carry out this necessary research.

## Earth Day Fest

April 22, 1990 will witness one of the greatest environmental events ever! Twenty years ago environmentalists issued a call to action on behalf of our endangered planet. A wave of citizen action was the result, and a focus on our national environment was the target. Important progress has been made, but so much more is left to be done to protect and restore the environment. Earth Day 1990 is a celebration of our progress and a call for worldwide recommitment to the planet.

The Better World Society has taken an active role in Earth Day 1990. Working with Cable TV Executive Jeffrey Reiss, Better World has helped secure commitments from the cable industry to schedule programming throughout April 1990 to focus on environmental concerns and stimulate action on behalf of the planet. So far 21 major cable television networks, including TBS SuperStation, HBO and The Discovery Channel, have agreed to participate.

Better World has also been working with the television press. *Broadcasting*, *Multichannel News*, *The Cable Guide*, *TV Entertainment* and *Electronic Media* will all carry, as a public service, an ad de-



signed by the Society to promote Earth Day 1990 and recognize those cable companies who have committed airtime for the environmental message.

The Society will participate in Earth Day 1990 activities with a campaign of environmental PSA's urging viewers to get involved. An encore presentation of Better World's best environmental documentaries will be telecast during Earth Week on VISN, the Vision Interfaith Satellite Network. (check your local listings)

Earth Day 1990 is being coordinated by the Earth Day Coalition, whose Advisory Board includes Better World leaders Ted Turner, Russell Peterson, Maurice Strong, Lester Brown and Jean-Michel Cousteau. For further information about Earth Day 1990 activities, and how you can get directly involved, please write to the Earth Day 1990 Coalition, P.O. Box AA, Stanford, CA 94309, or phone 415-321-1990 or 1-900-226-2212.

## Nominations Open for Fifth Annual Better World Awards

Glenn Olds, President of BWS, announced recently the opening of nominations for recipients of the 1990 Better World Awards. The Awards are given to individuals and organizations whose "exceptional contributions to promote a better world warrant broad public recognition," said Dr. Olds.

The Fifth Annual presentation ceremony will be held in New York City in October, 1990. Past winners have included Time Inc., the UN Environment Programme, Rotary International, President Mikhail Gorbachev, television hosts Phil Donahue and Vladimir Pozner, and others who have made extraordinary achievements in the fields of Peace Advocacy, Humanitarian Service, Communications, Environmental Protection, and Population Stabilization.

The Society encourages members to nominate individuals or organizations who are deserving of the Better World Award. No special application or format is necessary to make a nomination. Please

Continued on Page 4

## New Release: Teenage Mothers: A Global Crisis

*Teenage Mothers: A Global Crisis* is Better World's latest film addressing the critical need for family planning. One alarming and critical element of the global population problem is teenage pregnancy. Adolescent women who have children compound greatly the "usual" problems presented with population growth. In most instances, these teen-mothers are unequipped to handle the financial and social responsibilities of raising children. Therefore, the burden to society is even greater.

*Teenage Mothers* sheds light on not only the societal cost of babies having babies, but the causes of this vicious cycle. The film examines four teen mothers from developed and less-developed nations. Each individual has a particular story; each a "reason" for her predicament. But the film goes on to identify some common themes, including overall poverty, lack of choice for women, and low self-esteem, in hopes of sensitizing viewers to the complexity of the problem. The American College of Obstetricians and Gynecologists says *Teenage Mothers* puts "a national problem into a worldwide context." With *Teenage Mothers*, Better World has "taken the first step toward finding solutions."

The Center for Population Options "applauds the effort." Mariens Goland,

Media Director, adds "In producing this film, the Better World Society stresses the need to address teen pregnancy as a global problem."

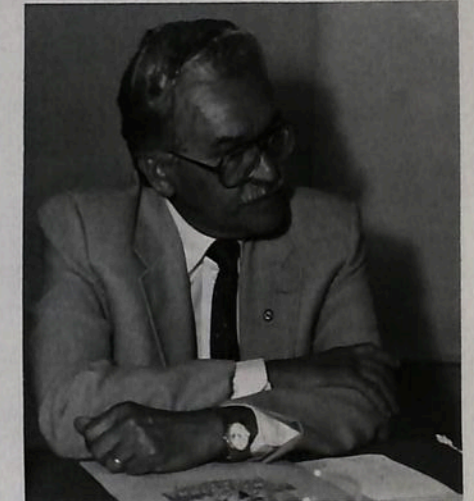
As with all Better World programs, we encourage members to use copies of this film at home, in school, youth and women's group meetings, and other venues to spread the message. Many members have written to Better World with news that these films do have an impact. Members have donated copies to local libraries, sent copies to their elected officials or used them to help recruit members for the Society.

*Teenage Mothers* includes messages from Planned Parenthood and The American College of Obstetricians and Gynecologists offering relevant information to viewers concerned about teenage pregnancy and family planning. Through television we can communicate with millions of people, passing on information to help them make responsible choices and decisions about the fate of our planet. You can obtain a copy of *Teenage Mothers: A Global Crisis* by using the coupon in this *Better World Letter*.

Production funding for *Teenage Mothers: A Global Crisis* has been provided by the International Planned Parenthood Federation, IPPF/Western Hemisphere Region, the Rockefeller Foundation, and the United Nations Population Fund.

CHICO MENDES from page 1

cil. In addition to Mr. Vaz da Costa, they include: Jose Goldemberg, Secretary of Education for the State of São Paulo; Paulo Nogueira-Neto, former Secretary of the Environment for Brazil; Jaime Lerner, Mayor of Curitiba, Brazil's "environmental capitol;" Zevi Ghivelder, Director of News for TV Manchete; and Rodrigo Mesquita, President of S.O.S. Mata Atlan-



Rubens Vaz da Costa, Secretary of Finance, State of Bahia, Brazil and BWS Director at BWS Press Conference in Brazil

tica, by many accounts Brazil's most effective environmental organization.

Many other contacts have been established during Belford's visits. Some will result in additional Council members; other supporters will help with specific BWS-Brazil projects. For example, actress Lucelia Santos hosted a screening of *Voice of the Amazon* at her home, as did Mr. Pedro Titelbaum, a key figure in film and video distribution in Brazil.

Better World-Brazil is already on the map. With more BWS-Brazil telecasts in development and with the expansion of our Brazil Leadership Council, the Society will be well-positioned to influence environmental policies in that critical nation, and to play an active role when the world environmental movement convenes in Brazil in 1992. Stay tuned!

Thanks to Rubens Vaz da Costa; Gisela Claper and Paola Prado of Contact Marketing International; Sandra Sinicco and Cristina Pinheiro Machado of *ECOPRESS*; Sergio Zobarán of Zobarán Comunicacoes; Miranda Smith, producer/director of *Voice of the Amazon*; and Victor Marques and Francisco Serrador of Turner Broadcasting for helping Better World get off to a strong start in Brazil.

## Better World Society-Resource Guide Order Form

We are pleased to be able to add this videocassette to the BWS Home Resource Library. This video, *Teenage Mothers: A Global Crisis* is available for members to purchase at cost. Please indicate the quantity you want, enclose your check made payable to Better World Society and include your member ID number. Please note we are no longer able to offer Beta Format videocassettes.

Enclosed is my check for \$ \_\_\_\_\_ Quantity: \_\_\_\_\_

**Teenage Mothers: A Global Crisis** ..... \$25.00

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Zip \_\_\_\_\_ ID Number \_\_\_\_\_

Better World Society • 1100 Seventeenth Street, NW • Suite 502 • Washington, DC 20036

# Is Gold Worth This? Amazon Is Being Poisoned

Continued From Page A1

annually in the Amazon Basin.

"If we do not take action now, we will have Minamata illness in Amazonia," warned Alberto Rojéiro Benedito da Silva, a geologist who is working to curb mercury pollution here in Pará State.

In Minamata, Japan, decades of dumping industrial mercury waste in a fishing area culminated in the 1950's, when more than a hundred fishermen died, dozens of others were poisoned and scores of babies suffered birth defects.

## Alarm Spreads in Brazil

The raid on a mining camp here is part of spreading alarm over the danger of mercury poisoning.

"The small farmers downriver complained about the pollution from the gold mining," Mr. de Sousa said as his men confiscated miners' water pumps.

With Pará responsible for almost half of Brazil's annual gold production of 100 tons, the state has become a focus for the battle over mercury.

In mid-July, Brazilian officials started negotiations with the World Bank for a \$200 million loan to diagnose and clean up mercury pollution on the Tapajós River, a major mining center.

## British Team Plans Study

In September, a British team from the University of London is to start the first major study of mercury pollution in the Amazon. With a \$1 million budget, researchers will spend two years studying the Tapajós, a river believed to have received 1,200 tons of mercury since 1958.

In a foretaste of what the study may find, Fernando Branches, a Brazilian doctor who will work with the British team, says he has identified more than 70 cases of mercury poisoning among patients he is treating in Santarém, a town 150 miles downstream from Itaituba, the major mining center of the Tapajós.

Many scientists fear that mercury poisoning may be a hidden problem in the Amazon because it shares symptoms with the more widely recognized health scourge, malaria. Both illnesses are marked by fever, tremors, diarrhea, headaches and blurred vision.

## The Effect on Humans

"Mercury pollution of rivers is a delayed-action time bomb," said Elmer Prata Salomão, director general of the National Department of Mineral Production, a state agency that is negotiating the cleanup loan with the World Bank.

So far, research has been sketchy on the effect of mercury on miners and on the two million other Brazilians who live in Amazon River communities. Fish is a staple of the diet of both groups. At the end of the Amazon food chain, fish can accumulate large concentrations of mercury.

Accumulating in humans, mercury can enter the central nervous system,



Bob Strong for The New York Times

For each pound of gold extracted from the rivers of the Brazilian rain forest, miners pour as much as two pounds of toxic mercury into the environment. In

Curionópolis, miners listened as environmental agents told them why they were closing down their jungle mining operation.

## 'Mercury pollution of rivers is a delayed-action time bomb.'

causing loss of muscle control, brain damage and death. In pregnant women, mercury can enter the placenta, causing birth defects.

It can take decades before concentrations reach toxic levels. In Japan, mercury pollution of Minamata Bay started in the early 1900's. Brazil's gold rush started in earnest in the early 1980's.

"There is good reason to suppose that serious injuries to the health of miners and local people have already taken place and that an enormous mercury contamination of the Amazon ecosystem is in progress," Olaf Malm, a biologist with a Rio de Janeiro research team, wrote this year in *Ambio*, the Swedish science journal.

A review of results from six surveys conducted in four Amazon states since 1985 indicates that mercury poisoning could emerge as a serious problem in the 1990's.

## High Quantities in Fish

Examinations of 34 fish caught downstream of gold-mining sites in three states, Pará, Rondônia and Amapá, found that 47 percent contained mercury exceeding Brazil's maximum permissible limit.

In Brazil, Canada and the United States, the maximum permissible limit is 0.5 milligrams of mercury per kilogram of wet fish. Limits in Western Europe are about twice as high.

Samples of common food fish netted below gold-mining operations on the Madeira River in Rondônia revealed average concentrations of 2.7 milligrams for the pintado fish and 2.1 milligrams for dorado.

Equally sobering were test results for men and women who eat the fish and who work with mercury — gold miners in the states of Pará, Amapá and Mato Grosso. Tests of hair samples taken from 174 miners at seven sites found that one-third — 58 people — had mercury over the tolerable limits set by the World Health Organization.

## Pregnant Women at Risk

The tolerable limits in hair are 6 parts per million. At 10 parts per million, a pregnant woman runs the risk of damaging her fetus. In adults, the first symptoms of mercury poisoning start to show at 30 parts per million.

In one extreme case, Raimundo Nonato Neto, a 35-year-old gold refiner at the Rat Strip Mine in Tapajós, had 113 parts per million in his hair.

Aware that banning gold mining in the vast, largely uncontrolled Amazon would be virtually impossible, the Brazilian authorities are trying several tactics to check its use.

Last year, the Government restricted the use of mercury in gold mining to holders of licenses. A year later, the measure is almost universally ignored.

Noting that mercury is not produced in Brazil, José Lutzenberger, Secretary for the Environment in Brazil's new Government, wants to control its importation.

## Mercury Shipment Seized

In late July, agents seized a shipment of 550 pounds of mercury destined for gold-mining camps in Rondônia. The police are investigating a company in Manaus that in recent years has been Brazil's single-largest importer. Far from the industrial centers of southeast Brazil, Manaus is the supply house for gold-mining operations throughout the Amazon.

Taking a different tack, the authorities in several states are promoting devices that reduce mercury waste. Mr. da Silva, technical director with Paraminérios, a state mining company, backs a portable centrifuge that separates heavy metals. Mass production is to start later this year in São Paulo. But the forecast price, \$50,000 a unit, is believed to be out of reach for most mine operators.

Indeed, on the raid here, the miners, who earn only \$75 a month, said they were more concerned with immediate survival than with long-term health risks.

"We have nothing against you working," Mr. de Sousa lectured disgruntled men assembled at one camp. "We are against your using mercury."

In response, one 32-year-old miner, José Ribamar Gomes da Silva, shot back, "How are we going to get home without bus tickets, without food?"

# Can Gold Be Worth This? Amazon Is Being Poisoned

By **JAMES BROOKE**

Special to The New York Times

**CURIONOPOLIS, Brazil** — Slipping a .38 revolver into the waistband of his blue jeans, Norberto Neves de Sousa led fellow environmental agents down a forest path to an Amazon gold-mining camp.

In rapid succession, Mr. de Sousa's agents dismantled three mining camps that were polluting a stream with mercury.

With more than half a million gold miners spread through the Amazon Basin, Brazilians are beginning to fear that their nation's largest gold rush could be sowing a new ecological disaster in a land straining to rescue its shrinking rain forest.

In a diabolical exchange, for each pound of gold extracted from the rivers of the rain forest, the miners pour as much as two pounds of toxic mercury into the environment.

Using a process dating from ancient Rome, the miners use liquid mercury to separate gold particles



The New York Times

Raids near Curionópolis are part of a campaign to curb gold miners' use of mercury.

from river sediments. Mercury, a heavy metal, bonds with gold. The amalgam is heated, the mercury is burned off and pure gold remains.

In the process, about half of the mercury escapes as vapor, which is inhaled directly by gold refiners or is returned to the earth with rain. The rest of the mercury, in the form of residue or ash, is generally dumped into rivers by miners. By some estimates, 100 tons of mercury is dumped

Continued on Page A6, Column 1

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By JAMES BROOKE

Special to The New York Times

RIO DE JANEIRO, Jan. 17 — Named Operation Free Forest, a two-week police action in the northern Amazon has led a third of 45,000 illegal gold prospectors to leave Yanomami Indian lands, Justice Ministry officials say.

But controversy flared this week after the Justice Ministry sought to soothe angry miners by offering them mining rights to about 7 percent of the jungle land claimed by the Yanomami.

Officials are weighing the cultural importance of the Yanomami, considered to be the last major isolated tribe in the Americas, against the economic importance of an area estimated to have produced \$1 billion worth of gold since 1987.

#### Singer Joins the Battle

Throughout the vast, mineral-rich Amazon, the battle between Indians and miners is becoming increasingly common and sharp.

Last week, a federal judge ordered the closing of the sole access road to the world's largest modern tin mine, Pitinga, which accounts for 10 percent of world tin production.

The judge ruled that an 18-mile stretch of road illegally cuts across a reserve of the Waimiri-Atriori Indians in Amazonas State. Since the Waimiri-Atriori started having frequent contact with whites 15 years ago, their number has dwindled from 3,000 to fewer than 400.

Moving to protect another Amazon tribe, the Kapapo, the British rock star Sting met on Tuesday in Brasilia with President Jose Sarney and a Kapapo chief, Raoni. After the meeting, the "Miners" read one banner at a demonstration at which prospectors applauded speakers who alternately attributed the Government's evacuation policy to multinational mining companies and the Vatican, a reference to official Roman Catholic support for Yanomami rights.

One afternoon, angry miners set fire to grass outside the residence of the local Catholic Bishop, Aldo Mongiano. The Italian-born bishop, who now has police protection, has complained that telephone death threats against him increased after President Sarney announced the evacuation policy last month.

On Jan. 3, six medical teams were flown to remote Indian communities sprinkled around the 36,367-square-mile area recognized as "Yanomami Indian lands" by Funai, Brazil's Indian protection agency. Since the 10,000 Yanomami have been decimated by imported diseases, largely malaria, influenza and measles.

But the next phase of Operation Free Forest — cutting off food and fuel to jungle miners — caused tensions to rise in Boa Vista, the young capital of Roraima. In that frontier state, mining is the last source of employment and the largest source of tax revenue.

#### Miners Stage Protests

As police reinforcements started to arrive early this month, demonstrations by miners broke out almost daily in Boa Vista's central square. The monument, a cement rendering of a

#### Corrections

An obituary by The Associated Press on Dec. 31 about Hermann Julius Oberth, a West German rocket scientist, misstated his birthplace. He was born in Nagyszeben, in Transylvania, an area that is now part of Rumania.

#### Traveling?

Check the weather... from Albany to Acapulco. The New York Times

# Gold's Lure vs. Indian Rights: A Brazilian Conflict Sets the Amazon Aflame



A gold prospector's plane being searched by police in Boa Vista as part of a campaign to curb illegal gold mining, which has posed a threat to parts of the jungle inhabited by an isolated Indian tribe, the Yanomami. A.B. Marcelo Regua

man in a broad brimmed hat panning for gold.

"The People of Roraima Back the Miners" read one banner at a demonstration at which prospectors applauded speakers who alternately attributed the Government's evacuation policy to multinational mining companies and the Vatican, a reference to official Roman Catholic support for Yanomami rights.

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shaken pilot was forced to land. Complementing announcements on the Amazon radio, the leaflets are to be dropped over the miners' 82 clandestine dirt strips and 200 river barges. They inform miners that they are working illegally on Indian land and offer them free transportation back to their towns of origin.

So far about 18,000 miners are believed to have voluntarily deserted such mining camps as JB, Cavetra and Burnt Bean. A Yanomami village that became the miners' major air hub, Papaytu, is now a federal police base. But with 6,000 men holed up in mining camps around Bahian Ant, a particularly rich area, the police fear that hard part may be yet to come.

#### Miners Stock Up

Several miners have boasted that they flew in enough provisions last month to enable them to hold out in the

Dejting the police, a handful of pilots, known in Boa Vista as cowboys, repeatedly buzzed the control tower of the city airport on the first night of the flight ban. When a government plane tried to drop leaflets over the city, other planes flew so close that the Amazon radio, the leaflets are to be shaken pilot was forced to land.

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United States Jan. 25 to 26.

Mr. Collor is expected to be given the Yanomami drama and urged a low-interest loan for development in Rondonia State, another area

of the Amazon frontier.

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# Gold's Lure vs. Indian Rights: A Brazilian Conflict Sets the Amazon Aflame

Special to The New York Times

RIO DE JANEIRO, Jan. 17 — Named Operation Free Forest, a two-week police action in the northern Amazon has led a third of 45,000 illegal gold prospectors to leave Yanomami Indian lands, Justice Ministry officials say.

But controversy flared this week after the Justice Ministry sought to soothe angry miners by offering them mining rights to about 7 percent of the jungle land claimed by the Yanomami.

Officials are weighing the cultural importance of the Yanomami, considered to be the last major isolated tribe in the Americas, against the economic importance of an area estimated to have produced \$1 billion worth of gold since 1987.

Throughout the vast, mineral-rich Amazon, the battle between Indians and miners is becoming increasingly common and sharp.

Last week, a federal judge ordered the closing of the sole access road to the world's largest modern tin mine, Pitinga, which accounts for 10 percent of world tin production.

The judge ruled that an 18-mile stretch of road illegally cuts across a reserve of the Waimiri-Atriori Indians in Amazonas State. Since the Waimiri-Atriori started having frequent contact with whites 15 years ago, their number has dwindled from 3,000 to fewer than 400.

Moving to protect another Amazon tribe, the Kapapo, the British rock star Sting met on Tuesday in Brasilia with President Jose Sarney and a Kapapo chief, Raoni. After the meeting, the "Miners" read one banner at a demonstration at which prospectors applauded speakers who alternately attributed the Government's evacuation policy to multinational mining companies and the Vatican, a reference to official Roman Catholic support for Yanomami rights.

One afternoon, angry miners set fire to grass outside the residence of the local Catholic Bishop, Aldo Mongiano. The Italian-born bishop, who now has police protection, has complained that telephone death threats against him increased after President Sarney announced the evacuation policy last month.

On Jan. 3, six medical teams were flown to remote Indian communities sprinkled around the 36,367-square-mile area recognized as "Yanomami Indian lands" by Funai, Brazil's Indian protection agency. Since the 10,000 Yanomami have been decimated by imported diseases, largely malaria, influenza and measles.

But the next phase of Operation Free Forest — cutting off food and fuel to jungle miners — caused tensions to rise in Boa Vista, the young capital of Roraima. In that frontier state, mining is the last source of employment and the largest source of tax revenue.

As police reinforcements started to arrive early this month, demonstrations by miners broke out almost daily in Boa Vista's central square. The monument, a cement rendering of a

shaken pilot was forced to land. Complementing announcements on the Amazon radio, the leaflets are to be dropped over the miners' 82 clandestine dirt strips and 200 river barges. They inform miners that they are working illegally on Indian land and offer them free transportation back to their towns of origin.

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"It will be a complete disaster because the miners leave a trail of devastation wherever they go," said Fernando Cesar Mesquita, president of the Brazilian Institute of Environment and Renewable Resources. "They level nature around the mines. They leave the rivers useless."

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# With Cloudy Crystal Balls, Scientists Race to Assess Global Warming

By WILLIAM K. STEVENS

Spurred by the anxiety of a public suddenly alert to the potential dangers of global warming, a small fraternity of scientists is running a high-stakes race against the environmental clock, trying to predict the precise impact of the greenhouse effect in time to take effective countermeasures.

Armed with powerful computers, the scientists are using advanced mathematical models — sets of equations that express the physical workings of the atmosphere — to simulate the world's climate under varying conditions. Their findings underlie almost all current forecasts about global warming. But because the evolving art and science of global climate modeling is still so imperfect, it is often a confounding business made all the more frustrating by policy makers' demands for answers.

The scientists all say with confidence that the greenhouse effect, in which carbon dioxide and other gases combine with water vapor to trap heat inside the earth's atmosphere, is going to make the earth warmer in the decades ahead. They say climatic changes will result

with important consequences for life on earth. But they cannot prove or agree on how much the earth will warm, or how fast, or how the warming will affect individual countries or regions, or whether it has already begun.

The reason, climatologists say, is that although the climate models are steadily improving, they are still

crude approximations of an atmosphere-ocean system so vast and complex that it nearly defies analysis.

"They are dirty crystal balls," said Stephen H. Schneider, a climatologist at the National Center for Atmospheric Research in Boulder, Colo.

For instance, widely differing answers emerge from attempts by three of the major models to gauge the effect on the United States of a doubling of greenhouse gases in the atmosphere. Two show an increase in summer rainfall the Southeast, but one shows a decrease. A different two show a drop in rainfall in the Great Plains, while the third shows an increase. Still another combination of two shows an increase of rain in California, while the third indicates a drop.

This uncertainty intensifies the dilemma faced by scientists and the policy makers they advise. They do not have precise answers about global warming, but if they wait for the answers and they are too long in coming, it will be too late to take effective action.

At this stage of their evolution, climate models are as much tools for basic learning as they are practical instruments of prediction. Are they any good, then, as guides to public policy?

The scientists who use the models say yes, because although the models' estimates vary in specifics, they point in the overall direction of change. At the least, they say, the models demonstrate that weather systems everywhere are sensitive to global warming, that disruption is likely and that a range of consequences is possible.

"There are going to be sizable effects, we know that

TUESDAY, FEBRUARY 7, 1989

NY TIMES

## The threat is building . . .

Certain gases are known to contribute to the buildup of heat in the atmosphere. Carbon dioxide is the most plentiful and best-known, but several others have an even greater heat-trapping effect per molecule. Atmospheric levels have steadily climbed in the industrial era.

**Methane**  
25 times CO<sub>2</sub>'s capacity to trap heat.  
Pre-industrial level: 0.75 parts per million.  
1986 level: 1.65 parts per million.  
**Current annual increase: 1%**

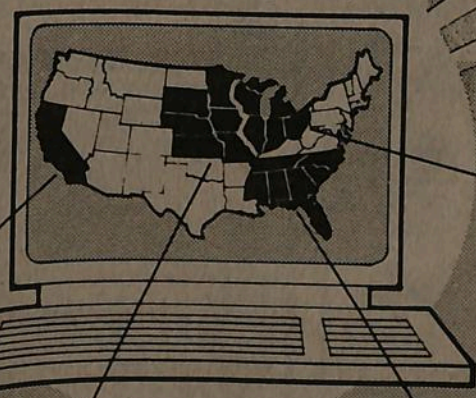
**Carbon dioxide (CO<sub>2</sub>)**  
Pre-industrial level: 275 parts per million.  
1986 level: 346 parts per million.  
**Current annual increase: 0.4%**

**Fluorocarbon 12**  
20,000 times CO<sub>2</sub>'s capacity to trap heat.  
Pre-industrial level: None.  
1986 level: 400 parts per trillion.  
**Current annual increase: 5%**

**Fluorocarbon 11**  
17,500 times CO<sub>2</sub>'s capacity to trap heat.  
Pre-industrial level: None.  
1986 level: 230 parts per trillion.  
**Current annual increase: 5%**

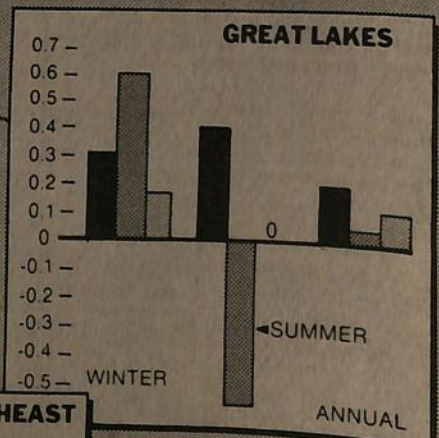
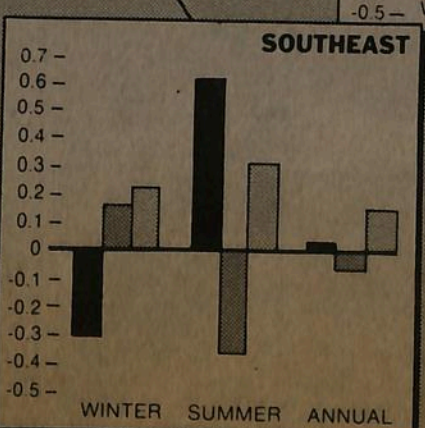
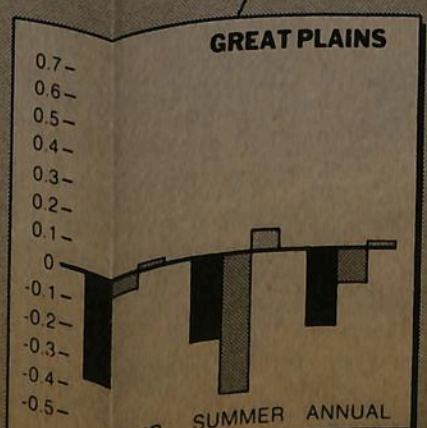
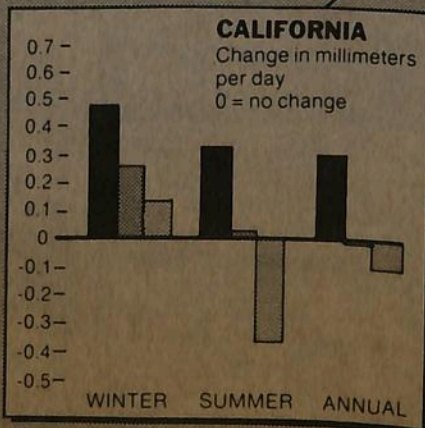
**Nitrous oxide**  
250 times CO<sub>2</sub>'s capacity to trap heat.  
Pre-industrial level: 280 parts per billion.  
1986 level: 305 parts per billion.  
**Current annual increase: 0.2%**

**The Greenhouse Effect:** Infrared rays in sunlight are absorbed in atmosphere by carbon dioxide and other gases, preventing their radiation back into space. Trapped rays are converted into heat, warming atmosphere.



## . . . but consequences are uncertain

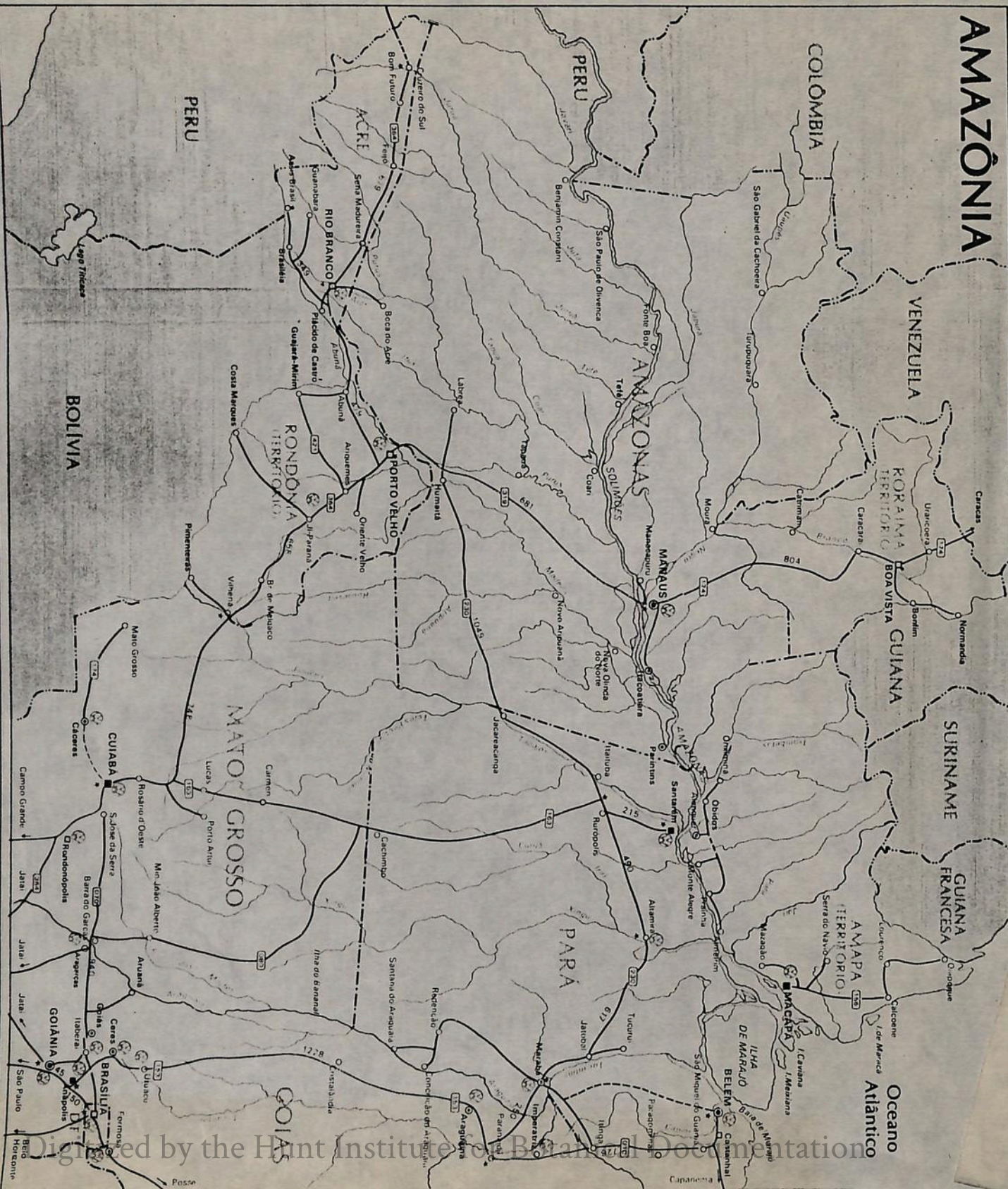
Several computer models have been used to try to predict how global warming will change the climate when carbon dioxide in the atmosphere reaches double the level of about three decades ago, sometime in the next century. All project significant impact on precipitation, but differ greatly on what the regional effects would be.



Sources: World Resources Institute, Environmental Protection Agency

Continued on Page 18

# AMAZÔNIA



Digitized by the Hant Institute of Botanical Documentation

AGRICULTURAL AND LIFE SCIENCES  
**COLLOQUIUM**  
1987-1988

presents

**Dr. Ghilleen Prance**

New York Botanical Gardens

discussing

**THE CONTRIBUTION OF ECONOMIC BOTANY  
TOWARDS THE SOLUTION OF THE  
DEFORESTATION PROBLEMS OF AMAZONIA**

SELECTED REPRINTS OF  
"IAN" PRANCE ARE IN  
MY MAILBOX, FOR ANYONE  
WHO WISHES TO PREVIEW  
THEM. —Bruce W.

Friday, April 15, 1988  
11:00 A. M.

202 Williams Hall

-----  
This seminar series is sponsored by the College of Agriculture, the College of Basic Sciences, and the Agricultural Experiment Station. For more information or to arrange an appointment, please contact Dr. Bruce Williamson, Dept. of Botany (8-2123).

15-IV- '88

BL

SCHEDULE FOR VISIT OF

DR. "IAN" PRANCE

Thursday

7:20 pm Arrive Baton Rouge Airport--pickup by Bruce Williamson

Friday

- ✓ 8:30 am Visit Dr. Bernard Lowy, 105 Radioisotope
- 9:00 am Visit Dr. Bruce Williamson, 101 Radioisotope
- 9:30 am Visit Dr. Jeff Weidenhamer, 117 Radioisotope
- 10:00 am Visit w/ Dr. Russ Chapman, 426 LSB
- 10:20 am Visit w/ Dr. Bill Platt, 311 LSB
- 10:40 am Seminar preparation, 301 LSB
- ✓ 11:00 am **SEMINAR--202 Williams**
- ✓ 12:30 pm Lunch w/ Dr. Shirley Tucker, Dr. Lowy, Dr. Weidenhamer
- 1:30 pm Tour Margaret Stones collection with Dr. Tucker
- 2:30 pm Visit Museum of Natural Science w/ Pete Mara & Kenny Rosenberg
- ✓ 3:30 pm **Open reception--coffee and tea in LSB 306**
- 4:30 pm Depart for Baton Rouge Airport w/ Michael Wiemann
- 6:00 pm Plane departs

Serra Araca - sp. nov.

Hevea in 1984,

Mandioca

Bolivia - ethnobotany

Chacabo Indians

1 hectare = 649 trees

619 used

- 1) rubber - 1 spp.
- 2) fuel - 14 spp.
- 3) food - 33 spp.
- 4) construction & crafts 235 spp.
- 5) medicinal 20 spp.

Penari Indians - Venezuela

Anavate - Brazil

Mishana near Iquitos

275 spp. / hectare  
842 trees

fruit, latex, wood.

Gmelina arborea [Lodwig]

Cattle - least economic  
tax - land speculation.

Bora Indians Peru

managed forest areas

near Iquitos! 6 var. g

Cassava planted by Ind.

Peel Palm

Rondonia

name 15-IV-88

1) Theobroma cacao LSV

2) Mahonia (mahogany)  
T. sp.  
T. sp.

Timber waste

3) Mimiqueria  
Coconut latex for  
chewing gum  
factory in Maués

+ 518 latex / tree

4) Bertholletia excelsa

5) Paulinia cupana

6) Guarana: ant  
excitation.

7) Paulinia spp.

8) Amiba rosadora Rose-  
wood. All cut down.

Fibrous palm; covers  
trunk.

9) Dipteris seeds; a  
fuel produced as a  
resin (2-20 liters / tree)

10) Manilkara for latex

11) Baleia

P. cassapa

All above exported by  
Brazil. \$10<sup>9</sup> income / yr

12) Hevea: Microrhizium  
brozhenii ubi  
henthomiana

Campora (resistant to  
fungus)

Marajo

Euterpe oleracea

many uses. exports  
palm hearts to  
France

Acai blom

Belem, Brazil forest  
→ ± \$9000/yr!! from  
natural products

Camu-camu - high  
in Vitamin C.

Babassu palm, central - almost = to Cocos  
nucifera!

Brazil, fire resistant!  
natural monoculture, for  
cooking oil, also charcoal  
(Sulphur free).



This view over the Varzea in Brazil painted by Frans Post in 1667 sold for \$330,000 during the January auction of important Old Master paintings.



Art. 18 OAS Charter - Non-intervention in  
internal/external affairs of any state.

Except: Self defence

SCHEDULE

Rio Treaty: Art. 3 - States have right to respond  
to armed attack by another state; uni-  
laterally, or collectively

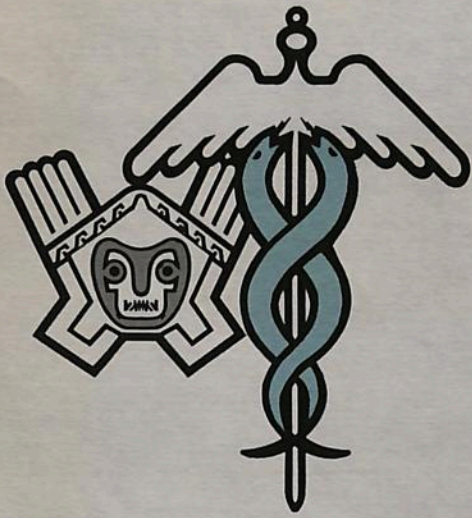
- ✓ Thursday, February 14 - "Colonial Background of Latin America"  
Paul Hoffman, History Dept.
- ✓ Tuesday, February 26 - "Population Growth, Environment Impact and Economic Development  
in Latin America" Herman Daly, Economics Dept.
- Tuesday, March 5 - "The End of Military Rule in Brazil"  
Stanley Hilton, History Dept.
- ✓ Tuesday, March 12 - "Biological and Ecological Impact of the Land Reform Program in  
the Brazilian Amazon" Bernard Lowy, Botany Dept.
- Tuesday, March 19 - "World System Theory and International Development"  
Michael Grimes, Sociology Dept.
- Thursday, March 26 - "Central America: The Cultural Matrix and Modern Implications"  
William Davidson, Geography and Anthropology Dept.
- Tuesday, April 9 - "External Constraints on Central American Political Development"  
Leonard Cardenas, Jr., Political Science Dept.
- Tuesday, April 16 - "The U.S. Foreign Policy and Human Rights"  
Mark Gasiorowski, Political Science Dept.
- Tuesday, April 23 - "Cuba and the Future of US/Latin America Relations"  
Lissandro Perez, Sociology Dept.
- Tuesday, April 30 - Panel Discussion - All professors will be present  
Special guest: James Bolner, Political Science Dept.

abuse!

Lectures begin at 7:00 p.m.  
in Coates 209

✓  
abuse of

- "Biological and Ecological Impact of the Land Reform Program in  
the Brazilian Amazon" Bernard Lowy, Botany Dept.



# II INTERNATIONAL CONGRESS ON TRADITIONAL MEDICINE

LIMA - PERU \* JUNE 26-29, 1988  
 Pre or Post Congress Cultural Tours to Cuzco, Machu Picchu, Amazon Jungle

## REGISTRATION FEES AND TRAVEL ARRANGEMENTS

\*M\*I\*L\*A\* Meetings & Incentives in Latin America has been appointed the official Congress representative for the U.S. and Canada. \*M\*I\*L\*A\* will centralize the registration and reservation of air and land arrangements for all concerned. Please call toll free 1-800-367-7378 or 1-312-249-1900 (in Illinois).  
 Suggested departure from the U.S.: Friday June 24, 6 pm from Miami. Saturday 25th at leisure and optional cultural tours/activities. Sunday 26th Congress begins.

### Registration Fees

Active Members* <sup>1</sup> .....	U.S. \$ 300.00	<input type="checkbox"/>
Associate Members** <sup>1</sup> .....	230.00	<input type="checkbox"/>
Students <sup>2</sup> , Observers <sup>3</sup> .....	200.00	<input type="checkbox"/>
Accompanying Guests <sup>4</sup> .....	150.00	<input type="checkbox"/>

\*academicians, MD's, PhD's  
 \*\*nurses, social workers  
 Includes attendance to inaugural session<sup>1,2,3,4</sup>  
 welcome cocktail<sup>1,4</sup> - scientific sessions<sup>1,2,3</sup>  
 Peruvian night<sup>1,4</sup> - closing buffet cocktail<sup>1,4</sup>  
 tours organized by the congress<sup>4</sup>

- I. Includes transfers airport-hotel-airport, hotel accommodations and hotel taxes.
- II. Includes transfers airport-hotel-airport, 3 breakfasts, hotel accommodations in Cuzco, half day tour to the Inca amphitheatre of Moray, full day tour to Pisac Indian Open Market - lunch included - and tour to the Inca Fort of Ollantaytambo; half day city tour of Cuzco and surrounding archeological sites; all day guided tour to MACHU PICCHU - lunch included. **OPTIONAL OVERNIGHT IN MACHU PICCHU MUST BE REQUESTED ASAP.**
- III. Includes transfers airport-hotel-airport, accommodations at the Explorama Lodge, tours to the primary and secondary jungle. All meals and taxes included.

### Accommodations in PERU

I. LIMA (5 days)	Double	Single
Extra nights	U.S. \$192.00	288.00
II. CUZCO (6 days)	48.00	72.00
III. QUITOS (3 days)	395.00	490.00
Amazon Jungle (Explorama Lodge)	240.00	260.00

### Refunds/Cancellations

All requests for refunds/cancellations must be made in writing, to \*M\*I\*L\*A\* and must received no later than May 20, 1988.

## GUEST SPEAKERS

- DR. OLAYIUOLA AKERELE  
 Program Manager, Traditional Medicine  
 World Health Organization  
 Geneva - Switzerland
- DR. MICHAEL BALICK  
 The New York Botanical Garden  
 Institute of Economic Botany  
 Bronx, N.Y.
- DR. CARMEN ENEIDA CRUZ PARRILLA  
 Escuela de Medicina  
 Dpto. de Psiquiatria  
 San Juan - Puerto Rico
- DR. SUPANG CHANTAVANICH  
 Dpt. of Sociology & Anthropology  
 Faculty of Political Science  
 Chulalongkorn University  
 Bangkok - Thailand
- DR. MICHAEL DILLON  
 Department of Botany  
 Field Museum of Natural History  
 Chicago, Illinois

- DR. ELAINE ELIZABEDOSKY, Ph.D.  
 Professor of Pharmacology  
 Laboratorio de Ethnopharmacologia  
 Universidad Federal de Para  
 Belem, Para - Brasil
- DR. L. FLOUR  
 Rheinisches Landeskrankenhaus  
 Psychiatrische Klinik der Universitat  
 Dusseldorf - West Germany
- PROF. NORMAN R. FARNSWORTH  
 Department of Pharmacognosy  
 University of Illinois  
 Chicago, Illinois
- DR. TERRY HUNTER  
 Association of American Indian  
 Physicians  
 Oklahoma City, Oklahoma
- DR. HIDEJI ITOKAWA, Ph.D.  
 Professor of Pharmacognosy  
 Tokio College of Pharmacy  
 Tokyo - Japan
- DR. JOE JAMAMOTO, M.D.  
 Biobehavioral Sciences  
 U.C.L.A. School of Medicine  
 Los Angeles, California

- DR. WOLFGANG G. JILEK  
 Transcultural Psychiatric Area  
 World Psychiatric Association  
 South Delta - Canada
- DR. TETSUO M. KOYAMA  
 Director of Asiatic Programs  
 The New York Botanical Garden  
 Bronx, New York
- DR. XAVIER LOZOYA  
 Instituto Mexicano para el Estudio de  
 Plantas Medicinales  
 Mexico D.F. - Mexico
- DR. JULIA MORTON  
 Morton Collectanea  
 Dept. of Biology, University of Miami  
 Miami, Florida
- DR. HIROSHI MITSUHASHI  
 Director, Tsumura Juntendo  
 Ibaraki - Japan
- DR. JUAN ENRIQUE MEZZICH  
 Dept. of Psychiatry, University of Pittsburgh  
 Pittsburgh, Pennsylvania - U.S.A.
- DR. DONALD J. ORTNER, Ph.D.  
 Curator, Dept. of Anthropology  
 Smithsonian Institute  
 Washington, D.C.

- DR. J. OTSUKA  
 Director, Research Section  
 Oriental Medicine Research Center  
 Kitasato Institute  
 Tokyo - Japan
- DR. RAYMOND PRINCE  
 McGill University  
 Montreal, Quebec - Canada
- PROF. TIMOTHY PLOWMAN  
 Department of Botany  
 Field Museum of Natural History  
 Chicago, Illinois
- DR. ANTONIO SCARPA  
 Museo de Etnomedicina  
 Universidad de Genova  
 Genova - Italy
- DR. MOTOYOSHI SATAKE  
 Tsukuba Medicinal Plant Station  
 National Institute of Hygienic Sciences  
 Ibaragi - Japan
- PROF. RICHARD EVANS SCHULTES  
 Professor of Biology  
 Botanical Museum of Harvard University  
 Cambridge, Massachusetts
- DR. WILLIAM B. WALSH  
 Director, Project Hope  
 Washington, D.C.

## II INTERNATIONAL CONGRESS ON TRADITIONAL MEDICINE

LIMA - PERU  
 JUNE 26-29, 1988

### REGISTRATION FORM

Name \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Accompanying Guest(s) \_\_\_\_\_

my registration fee of \$ \_\_\_\_\_

guest registration fee(s) \$ \_\_\_\_\_

accommodations in Lima \$ \_\_\_\_\_

& post-cultural tours

Cuzco \$ \_\_\_\_\_

and/or Amazon Jungle \$ \_\_\_\_\_

Enclosed please find my check

TOTAL U.S. \$ \_\_\_\_\_\*

Please make my air reservations departing from \_\_\_\_\_ airport

Mail to: \*M\*I\*L\*A\*  
 38760 Northwoods Drive  
 Wadsworth, Illinois 60083 or call 1-800-367-7378

Please photocopy before mailing.  
 If you need more registration forms,  
 please call 1-800-367-7378 or 312-249-1900  
 \* You may charge this amount (including air)  
 to your preferred credit card.

## Questions EDF Members Ask About Tropical Forest Destruction

1. **If tropical forests cover about 7% of the Earth's land surface, that's more than 2 billion acres. It doesn't seem likely that anything short of a natural catastrophe could destroy them.**
  - A. Unfortunately, we do have a catastrophe—a man-made one. An area of rainforest the size of West Virginia is irreversibly destroyed every year. The problem has two parts: policy and money. The destruction of the remaining rainforests is actually planned and underway, in the name of agriculture, resettlement and population expansion.
2. **Isn't that destruction a long way off?**
  - A. Unfortunately, even our most optimistic estimates show that virtually all our rainforests will be gone by the year 2032—only 45 years from now.
3. **But won't the agriculture and other projects provide offsetting benefits?**
  - A. The tragic fact is that the big projects that are the most destructive of the tropical forests have never proved to be of any lasting benefit—nor even of any short-term benefit except to land speculators and a few cattle farmers.
4. **What is responsible for this destruction?**
  - A. Poorly planned economic development projects and policies that fail to consider the welfare of native peoples and the protection of their environment.
5. **But how in the U.S. can we influence the policies that are destroying distant rainforests and displacing indigenous peoples?**
  - A. By influencing Multilateral Development Banks (MDBs), four giant international banks—including the World Bank—that receive billions of dollars from the U.S. and other industrialized countries to prepare economic plans and loan "seed money" for development projects in the Third World.
6. **But shouldn't the people of the Third World have the largest voice in preserving their own environmental resources?**
  - A. Exactly. All too often, the MDBs have been encouraging unsustainable over-exploitation of resources for export rather than concentrating on the domestic needs of the developing nations. EDF seeks to work with local peoples to discover policies that will provide them sustainable benefits, and to advocate these investment policies before the MDBs.
7. **What are the other Multilateral Development Banks besides the World Bank?**
  - A. The Inter-American Development Bank, the Asian Development Bank, and the African Development Bank.
8. **How much money is involved?**
  - A. The World Bank and the other MDBs loan more than \$24 billion per year to developing nations, and in so doing, influence the economic and planning policy in more than 100 countries. Private banks and local government agencies, acting on the MDBs' stamp of approval, also loan funds for these projects, ultimately tripling the amount of money involved to over \$75 billion per year.
9. **What kinds of destructive projects have been financed?**
  - A. Among them are:
    - Massive rainforest clearing and agricultural resettlement in Brazil and Indonesia that have proved time and again to be exercises in heartbreaking futility.
    - A series of dams in India that will create the grave risk of water-borne disease and dislocate more than a million indigenous tribal people with their spreading backwaters.
    - Export cattle ranches in Africa where the people can't afford to buy meat, and where similar projects have failed.
10. **Aren't there any beneficial projects?**
  - A. Many World Bank projects on a smaller scale prove to be of substantial benefit. For example: EDF, in consultation with local rubber producers and tribal people, recently convinced the World Bank and Inter-American Development Bank to finance the setting aside of unprecedented "Extractive Reserves" for rubber tappers in the Brazilian rainforest. Many of the giant MDB projects, however, are disasters.
11. **This seems like such a massive problem. How can EDF and my contribution make any difference?**
  - A. It is a giant problem. But it is a problem that is caused by policy—policy that we at EDF are on the way to changing by applying reason together with legal and moral pressure in places like the World Bank. Your petition will help us show that citizens across America are deeply concerned about this world-wide tragedy. And your contribution, no matter how large or small, is "leverage" money that will affect the more than \$75 billion in projects the World Bank and other MDBs support each year.

# ENVIRONMENTAL DEFENSE FUND

257 Park Avenue South  
New York, NY 10010  
(212) 505-2100

Frederic D. Krupp  
*Executive Director*

HELP US PUT OUT THE FIRES IN BRAZIL.  
PLEASE RETURN THE ENCLOSED PETITION  
TO URGE THE WORLD BANK TO STOP THIS  
DESTRUCTION.

Dear Friend,

I didn't grasp the horrible scope of Brazil's rainforest destruction until I saw the picture I've enclosed for you.

It was taken from the U.S. space shuttle high above the Amazon rainforest in Brazil.

It shows an area of tropical forest half the size of California engulfed in thousands of fires.

More than 7 million acres of irreplaceable rainforest -- wintering grounds of North American songbirds -- ancestral home to dozens of native Indian tribes -- habitat to tens of thousands of animal and plant species, many of them rare and endangered, none identified or studied for their benefits to mankind ... all being systematically destroyed by fire.

That's when the scope of the worldwide tragedy of tropical rainforest destruction hit home with me. It made asking you to return the enclosed special petition to the World Bank all the more urgent.

## Why the World Bank?

Because these thousands of forest fires in northwestern Brazil are not caused by hunters or poachers or manufacturing. They are caused by a single, massive, yet totally misguided agricultural development project ... a project funded by the World Bank and partly financed by you and other U.S. taxpayers.

The World Bank -- and the other Multilateral Development Banks (MDBs) -- are lending tens of billions of dollars a year for huge projects that are destroying tropical rainforests and other critically endangered natural resources. Yet, these banks were created to help the economies of developing nations, not to destroy their ecology.

The good news is that the Environmental Defense Fund has

(over, please)

1616 P Street, NW  
Washington, DC 20036  
(202) 387-3500

1405 Arapahoe Avenue  
Boulder, CO 80302  
(303) 440-4901

2606 Dwight Way  
Berkeley, CA 94704  
(415) 548-8906

1108 East Main Street  
Suite 800  
Richmond, VA 23219  
(804) 780-1297

# World Lenders Facing Pressure From Ecologists

## Activists Urge Banks to Halt Harmful Projects

By PHILIP SHABECOFF  
Special to The New York Times

WASHINGTON, Oct. 29 — The World Bank and other international development institutions are being pressed to stop financing what critics, including the Reagan Administration, complain are environmentally destructive projects.

The big banks are starting to react to the criticism and to promise change. In his first major speech as new president of the World Bank, Barber Conable said recently that the bank must "balance growth with environmental protection."

As he spoke, environmentalists from five continents demonstrated nearby to protest what they said were the environmentally destructive lending policies of the World Bank and other international development institutions, including the Inter-American Development Bank, the Asian Bank and the African Bank.

### Indonesia Project Criticized

This month, an international consortium of conservation organizations, led by the Environmental Defense Fund, sent Mr. Conable a report condemning a World Bank-financed project in Indonesia. The plan would resettle hundreds of thousands of people from the island of Java to the Indonesian parts of Borneo and New Guinea. The report said the project would destroy millions of acres of rain forest while placing the settlers in an environment that would not sustain long-term development.

Bruce Rich, a lawyer for the Environmental Defense Fund, said the Indonesian project "is only the latest example of systematic World Bank environmental negligence that has been documented in 17 Congressional hearings over the past three years."

The Reagan Administration, members of Congress and environmental groups are pressing on the development banks to finance only environmentally sound projects.

These critics say many loans by these development banks are blocking economic progress in some poor countries because the projects they support often help destroy natural systems like forests, farmland and watersheds that are essential for sustainable development. The large-scale, capital-intensive projects often displace local popu-

### Continued From Page 1

lations and can destroy their culture, the critics say.

Earlier this year, for example, there were strong protests when the World Bank announced, over the objections and dissenting vote of the United States, approval of a \$500 million loan to Brazil for large-scale hydroelectric projects. The loan was the first of three, totaling over \$1 billion, that the bank is planning for hydroelectric projects in Brazil.

### Calls Loan a 'Folly'

Hugh W. Foster, the alternate United States executive director of the World Bank, in opposing the loan at the board meeting, used words like "folly" and "environmental disasters" to describe the power projects the bank proposes, to finance.

Environmental groups said they were "dismayed and distressed by the environmental negligence which characterizes this loan."

They said hundreds of square miles of vital tropical forest would be flooded and indigenous people displaced.

The bank's vice president for operations, S. Shahid Husain, said last month that the power projects in Brazil were well advanced and that the bank's participation would help "mitigate" environmental damage.

Mr. Rich said loans for environmentally destructive projects by the big development banks were "a critical issue." Noting that the development institutions make development loans totaling over \$20 billion a year and that these loans generate twice again as much development money from public and private sources, he said the activities of the World Bank and other development banks "are very important."

"They can determine the ecological health of two-thirds of the world," he said.

### Pressing Environment's Case

The Reagan Administration, acting under legislation passed by Congress late last year, is pressing the development agencies to make environmental concerns a more central part of their planning and lending activities.

Critics of the banks point to the famine in some African countries and the growing dependence many other countries on that continent on food imports as a dramatic example of development assistance gone awry.

These critics are now focusing on a World Bank project to help underwrite expanded cattle ranching in Botswana as what they say is a horrendous example of inappropriate development. The project, the third such internationally assisted cattle program in Botswana, would fence off what has been communal grazing land for a few ranches to be owned by individuals. Most of the meat would be exported to Europe.

Senator Bob Kasten, Republican of Wisconsin, a frequent critic of the environmental policies of the multilateral banks, said the project "would extend human suffering" in Botswana by destroying by excessive cattle grazing the grasslands that are that country's basic economic resource.

World Bank officials said the project would enhance Botswana's range lands so it would better nourish both cattle and wildlife.

Spokesmen for the World Bank and

the Inter-American Development Bank said increasing attention was now being given by their institutions to the environmental aspects of their development assistance programs.

Dr. James Lee, environmental adviser for the World Bank, said his staff conducted environmental reviews of bank projects whenever the projects could have an environmental impact. He said the bank was increasingly lending money for environmentally oriented projects like reforestation and soil conservation, although these "are not typical projects of the bank."

"Traditionally," he said, "our projects are more socio-economic, aimed at earning more foreign exchange and creating employment."

"Belatedly, but surely," he said, "the development institutions are recognizing that the development process itself is not without its own threats to the environment and the social well-being of the developing countries."

But the conservationists and critics within Congress and the Administration, although acknowledging that more attention is being given to environmental issues among the multilateral banks, say that so far this concern has not been translated into the broad policy changes that are required.

### 'Mostly Just Talk'

"They are struggling with the issue, but it is still mostly just talk," said Barbara Bramble of the National Wildlife Federation. "The issues we are talking about are not central to their decision-making process."

What is needed, she said, are "profound changes" in the multilateral banks' view of the development process. She and other critics of the banks insisted that appropriate development planning should start with protecting the resource base of a country to assure long-term security of the people.

This would entail, they said, a turn away from the traditional huge dams and large-scale single-crop farming for exports, and away from deforestation for resettlement and lumber exports and other projects customarily financed by the banks. These projects tend to destroy the land, grass, trees and water on which people depend on for their survival as well as to create health problems and to displace indigenous dwellers in the area of the projects, the conservationists contend.

"What we are advocating is not just a little environmental window dressing for elitists," said Brent Blackwelder of the Environmental Policy Institute in Washington. "We firmly believe that development assistance should leave those directly affected better off than before."

Representatives of the banks said that although there were environmental flaws in many of their projects, their efforts generally promoted environmental protection.

Dr. Lee of the World Bank said that "I cannot say the bank is no longer financing projects that are environmentally destructive."

"A lot of problems come up because we cannot always control what happens," he said.

But he added that the bank also supported many programs that help the environment, programs like reforestation, soil conservation, creation of national parks, sewage systems and the provision of clean drinking water.

Continued on Page D24, Column 1



AMAZONS  
*according to Acuña*

VALLEY  
OF THE  
AMAZONS

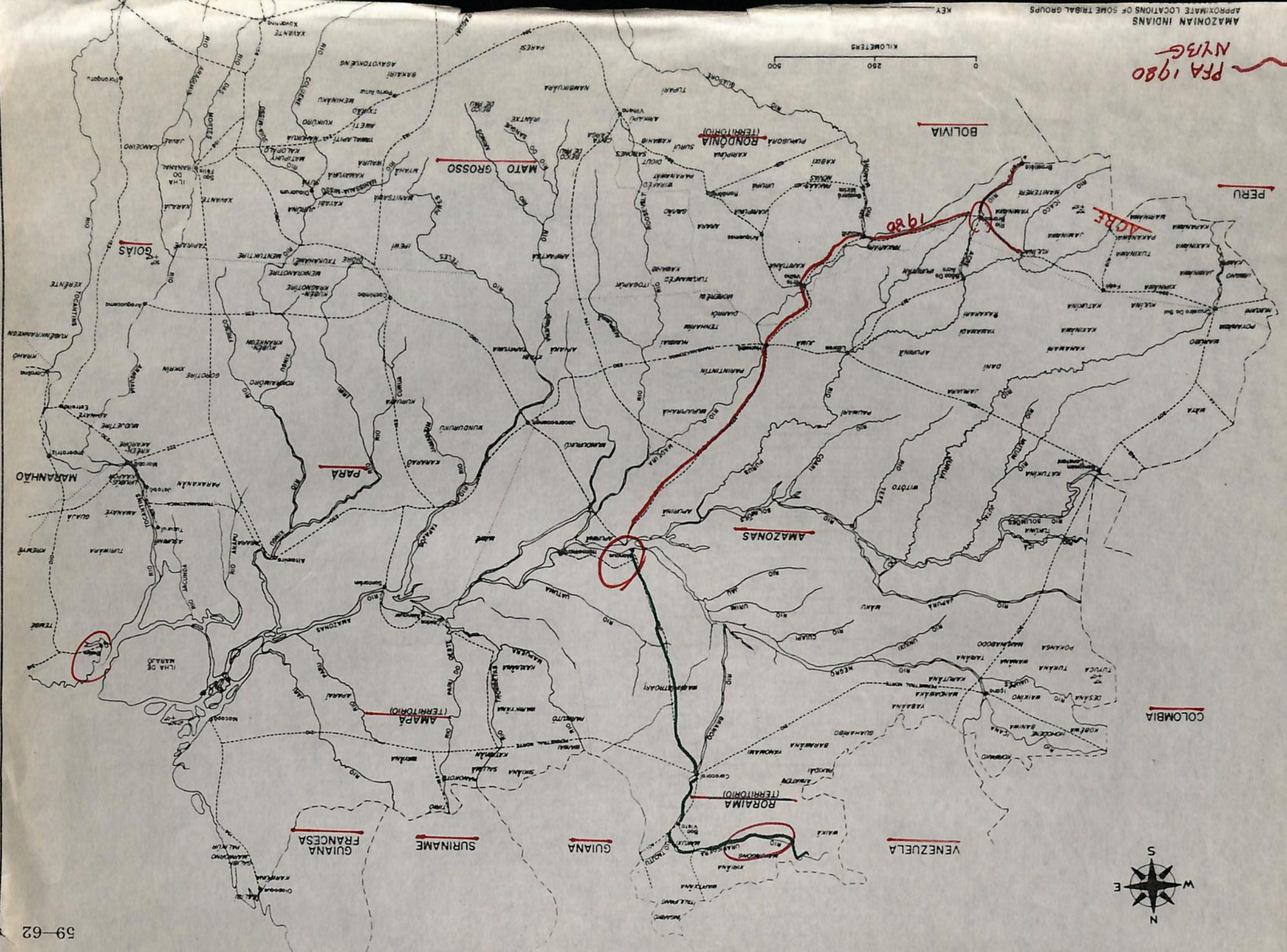
*(The names of Tribes in Italics)*

C.R.M.

PFA 1980  
NYBG

APPROXIMATE LOCATIONS OF SOME TRIBAL GROUPS  
AMAZONIAN INDIANS

0 200 500  
KILOMETERS







1

2

3

4

A

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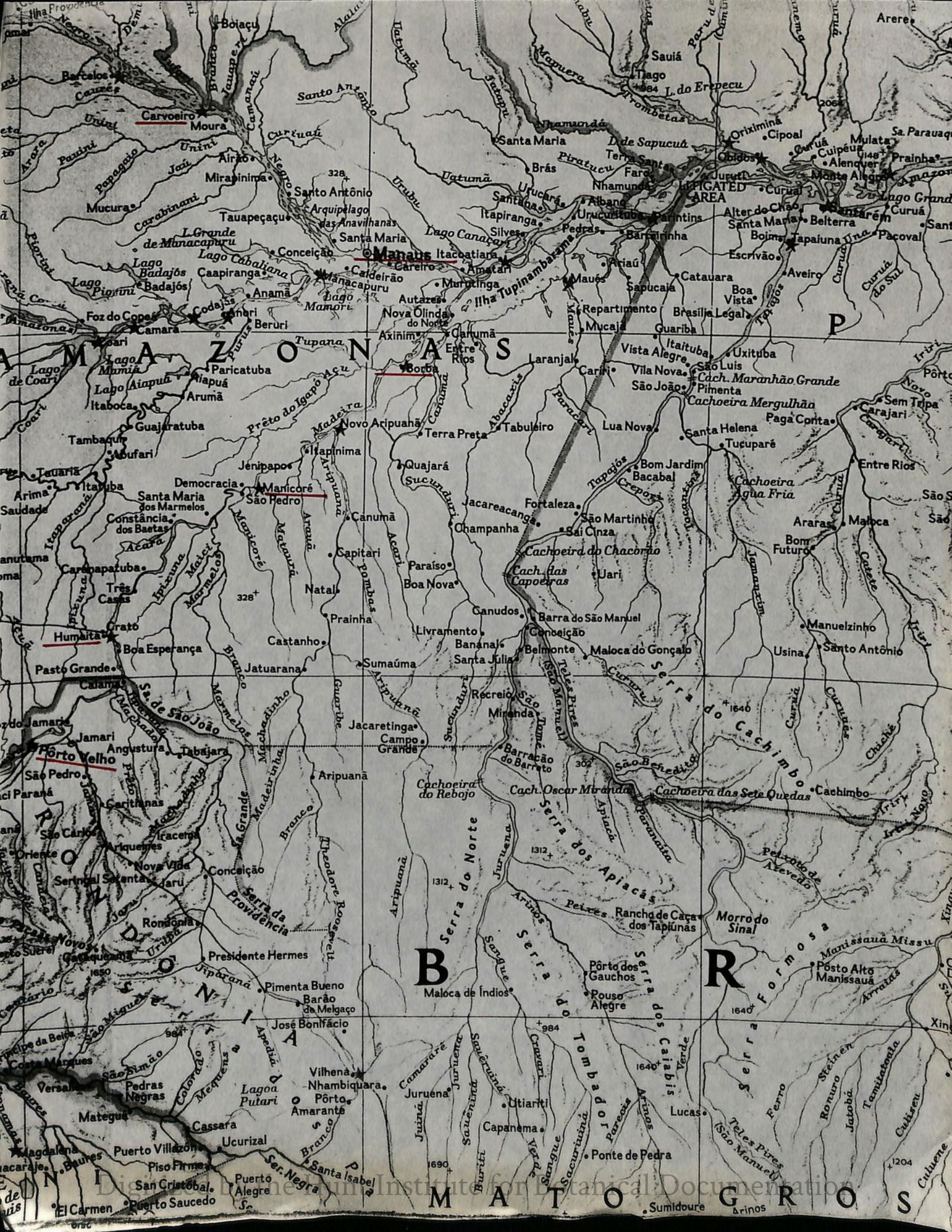
C

**SURINAM**  
(DUTCH GUIANA)

**FRENCH GUIANA**

**RORAIMA**

Digitized by the Historical & Cultural Documentation Center





RORAIMA

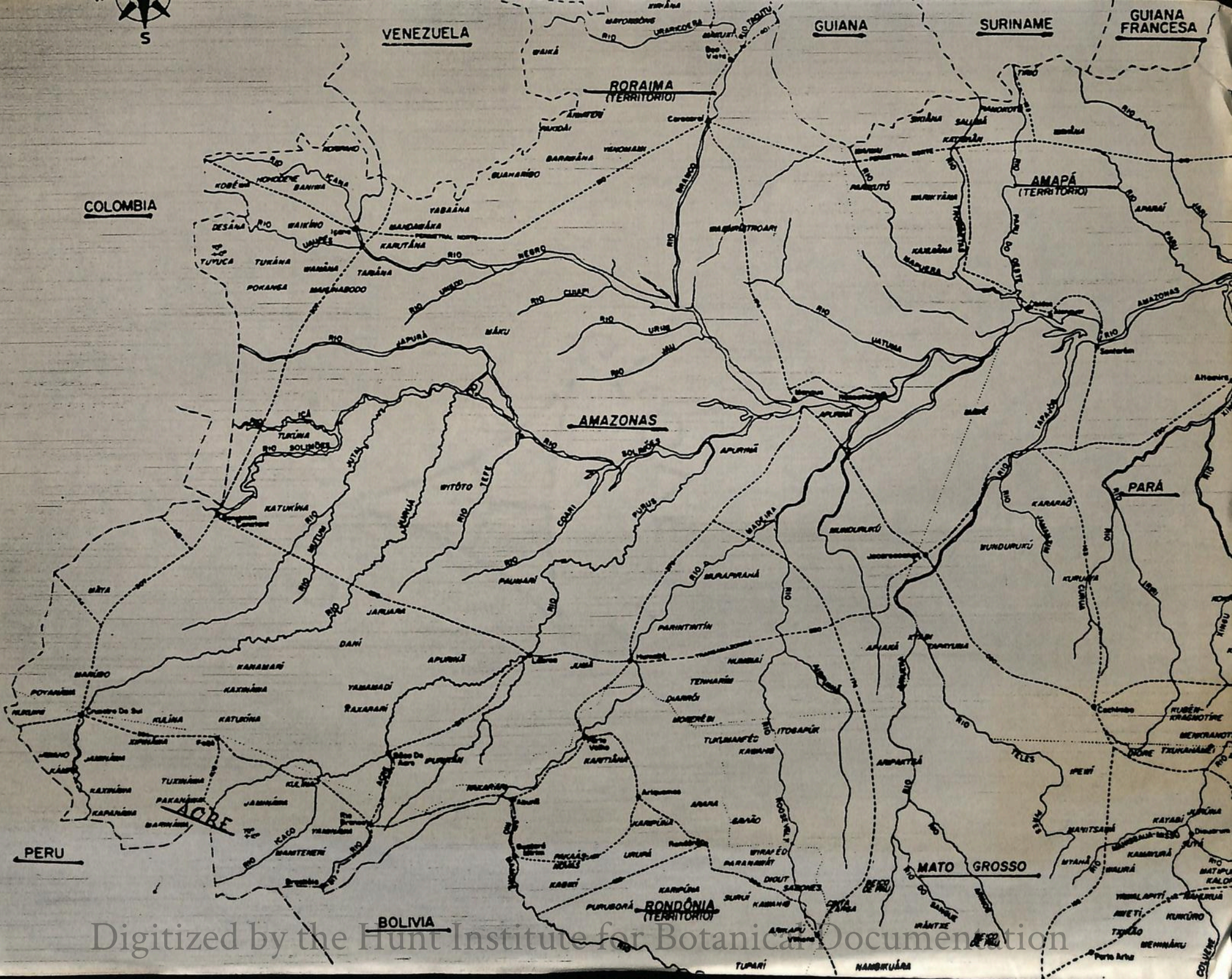
AMAZONAS

PARÁ

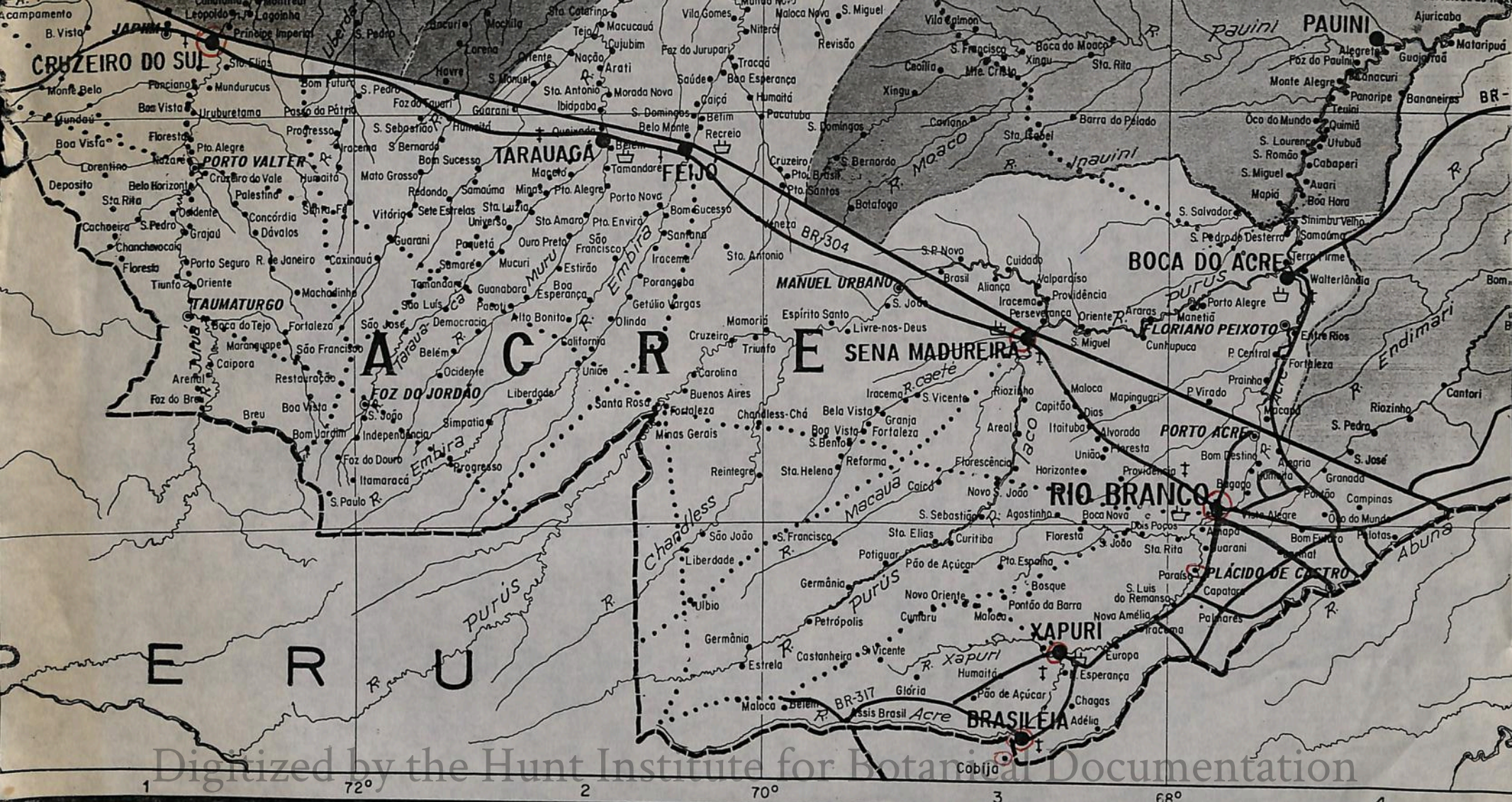
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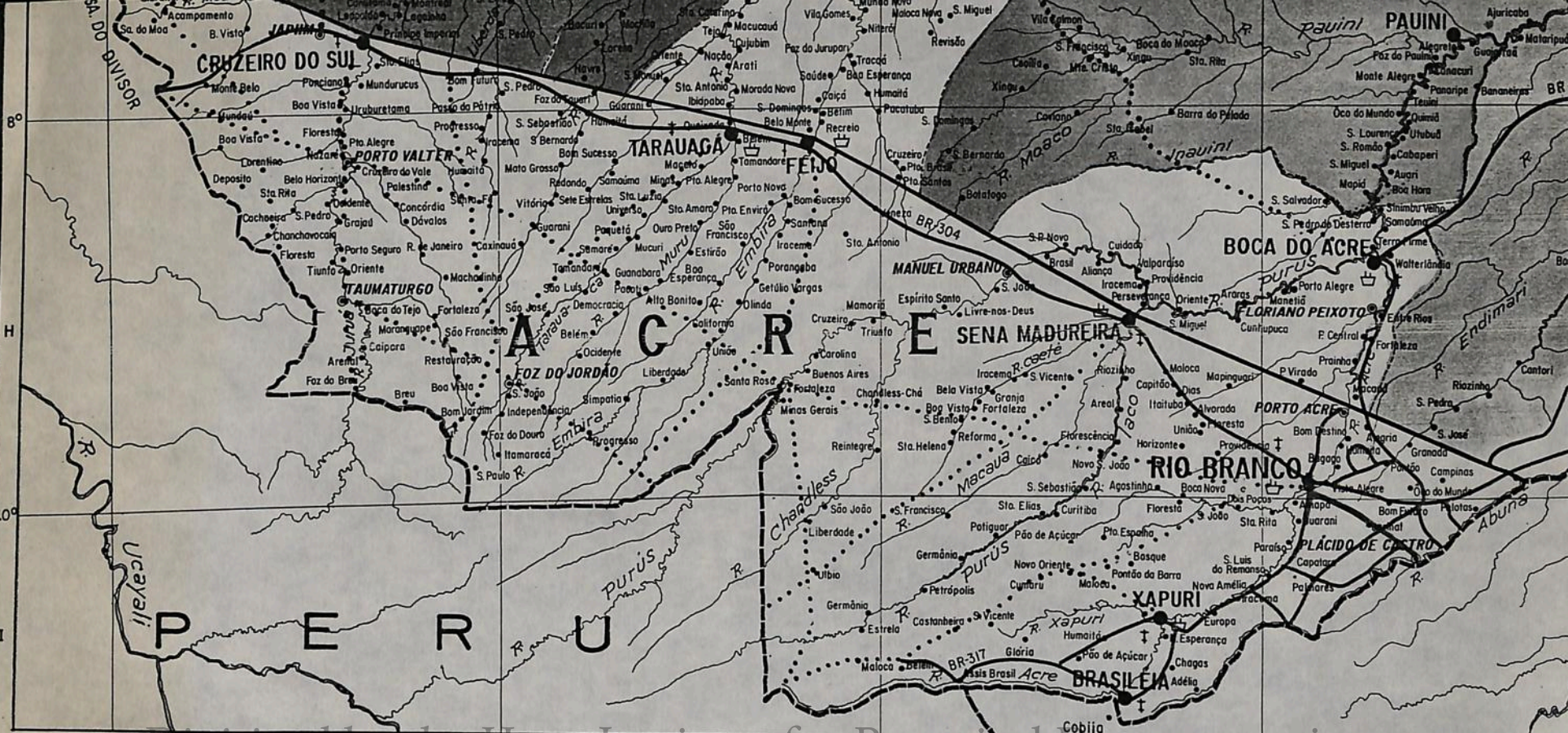
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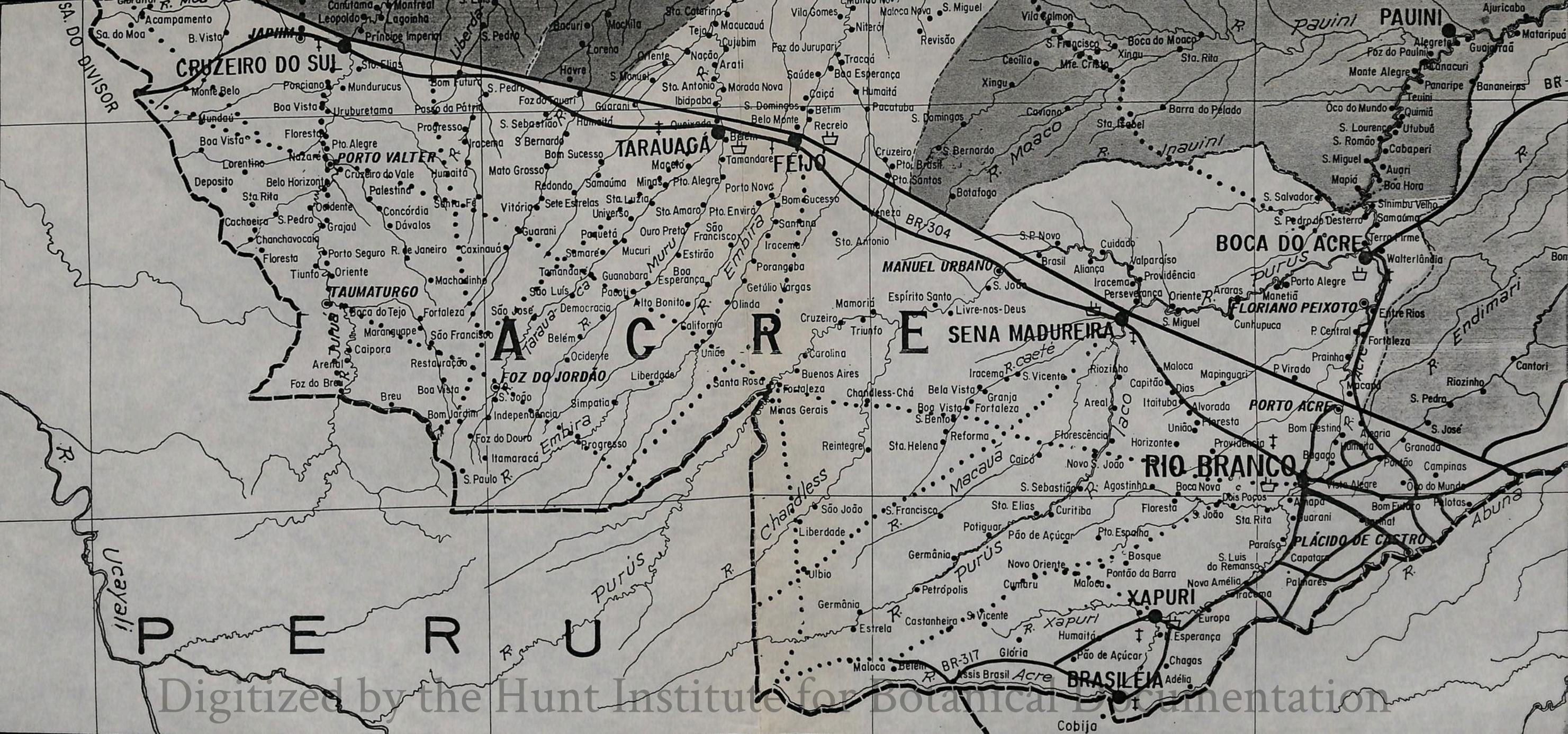
A











D. Attenborough || The Living Planet ||

Climbing apparatus, hand held on rope.

Canopy - Sab.

Climbing. Canopy of forest, warmth & wetness.

More measured over. Amazon - Stairs - India -

N. Carina - Amazon jungle.

Ceribee  
pentacordo.

Kapok tree 7 200' h. wind in canopy. Harpie eagle at top of trees, Insect life. Adaptations & warm ants

Sword Monkeys. No seasonal changes. Eternal summer!

Cross pollination by insects, etc. Night: Bats live on fruit. Marmosets take sap from trees. Place for orchids.

Bromeliads - epiphytes. Tarentula, frog (arrow poison) live in bromeliads. Reptiles down to 270'. Climbing snake! Slithering snake! Flying squirrel Marmosets

leap 1 m. to leaves, Lizards feed on insects; spiders ternets Macaws nest in tree trunks, fruit feeders. Holes in tree trunks. Golden marmosets

Tall rots shallow; hubs

Kapok.\*

Soil poor, high humidity, hot, fungi, beetles work on litter. Rafflesia in Sumatra. Carion flies

Pollinate flowers, grow on vines

2/3

2 Termites, eaten by spiders, whip scorpion  
On leaf letter: Planoria, Pirivator hunts spiders.

Beetles eat wood. Phanid,

Auca of Ecuador Chonta Palm, Edible → chicha  
Huarani

→ Climbing ants leave on ankles.

Seeds of Bixa. Genipaka → black dye

Arrow poison, Cevare

Blow pipe

\* Buttress for communication — as drum

Hamlet monkey in S.A.

Borneo: requiring frog.

Pheasant dance

\* Cock of Rock in Ecuador. mating display

Jungle staple: tenax: humidity — ancient 10<sup>th</sup> yrs ± 20x18

Stick insect. bettle like seed. Dead leaf mantis:  
Mimicry

Rain abundant, floor of forest flooded — exit to river.

Taquear hunting in yo.

After storm. A gauti

Falling tree! Kapas

tnd

from Dozi. 28-IV-1985

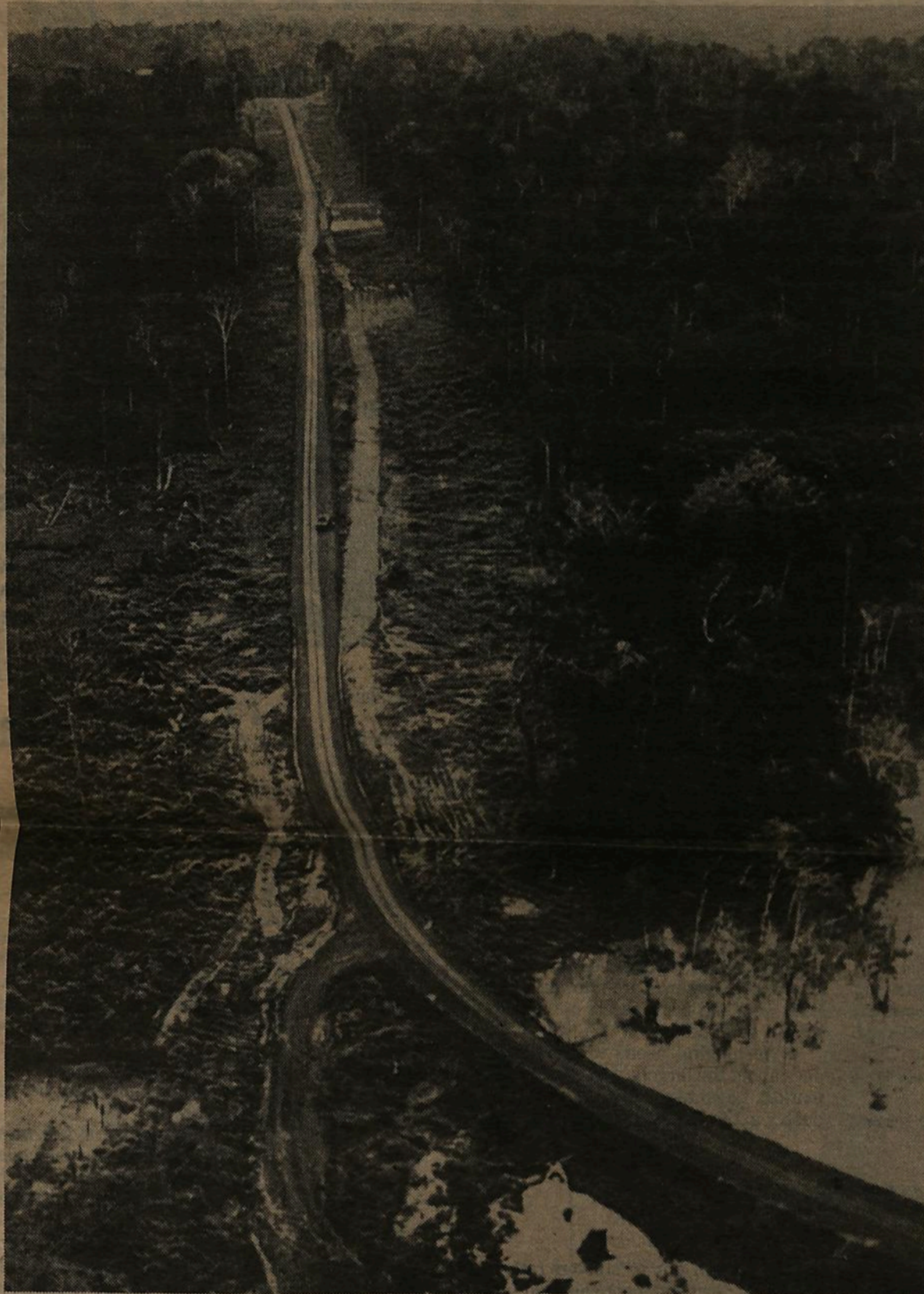
TRYING TO TAME THE RUGGED FRONTIER

# BRAZIL

FOURTH OF FOUR PARTS

# Farmers, fortune-seekers pack

By James Nelson Goodsell  
Staff writer of The Christian Science Monitor



**T** WILIGHT seeps steadily into nightfall as the Sao Joao Baptista quietly slides against the battered wharf after its trip up the Amazon River.

The stubby little riverboat has come 1,000 miles from the Atlantic. Its human cargo of 111 homesteaders, some of them children age two and three, wait apprehensively on the deck as boat handlers tie it up and customs agents come aboard.

Within 12 hours, the Sao Joao Baptista will be headed downriver bearing freshly harvested mangoes and other fruit of Amazônia.

The new homesteaders waiting on board are part of a human flood of Brazilians and foreigners sweeping into this steamy, vast, almost untapped and largely untamed Amazon Basin.

The rush to this Wild West-like region — some 2 million square miles or almost half of the country — is a bit like that to the western United States 100 years ago.

It comes as the result of Brazil's massive development boom of the 1970s.

First, the 2,000-mile Amazon Highway was laid through dense rain forest to the northern states of Amazonas, Rondonia, and Acre. Then came the smaller highways and roads, which now carry thousands of pioneering Brazilians to new lives — and possibly to new fortunes — in the Amazon and the states of Mato Grosso and Mato Grosso do Sul.

The highway offered relief to people of the drought-ridden, overcrowded northeast, and opened a door to the Amazon's vast mineral and timber resources.

The new settlers have helped turn Manaus, Boa Vista, Rio Branco, Porto Velho, and Cuiabá into boom towns.

Manaus itself has known an earlier rush of eager fortune-seekers. The discovery of rubber plants led to a mighty human tide at the turn of the century, but that westward move ended when rubber-growing began in Malaysia. Brazil's rubber boom went bust before World War I.

"At least 200,000 a year are migrating into the wilderness," says Ernesto de Aguiar, an official at the Manaus office of Brazil's Institute for Colonization and Land Reform. But he says there is no exact tally on the numbers of immigrants.

"They come from all parts of Brazil — and elsewhere, too. I think a lot of them get a surprise when they arrive. They think, because there are highways and plane flights, that life here will be less difficult than it was on the frontiers of the past.

"How wrong they are!"  
"But I suppose the lure of the frontier gets them. I know. It got me. That's why I came here from Recife."

Rodrigo Mendes Dias, an official at the Cuiabá office of the Institute for Colonization and Land Reform, says: "There may be other land frontiers around to lure the pioneer. But for the moment Brazil is the world's most popular frontier."

The frontier is attracting homesteaders, gold prospectors, and prosperous farmers from Brazil and south who want more land. It is attracting banks and big international corporations involved in agribusiness.

But Brazil's west is still very much a frontier. In Cuiabá, capital of Mato Grosso State, police

**Gold prospectors and soybean farmers, men on horseback and in flashy European cars: They're all traveling the Amazon Highway — pioneers out to make their mark in one of the world's last frontiers.**



JOAN FORBES — STAFF

Top: Brazil's Amazon Highway ribbons through world's largest rain forest.  
Right: Frontier region occupies almost half the territory of Brazil.

**THIS SERIES**  
Previous articles in this series were published March 13, 14, and 15.



"The frontiers pioneer. Brazil is the most popular frontier."  
— A la

# their bags for Brazil's wild west

say that they have a hard time keeping order, particularly on the edges of the town, which has grown 20-fold in population in just five years.

It is even rougher in Pindaíba, 100 miles from Cuiabá, where Police Sgt. José Piva says, "The local saloon usually has at least one good fight on a Saturday and it is not uncommon to have some shooting as well."

"Don't forget we are on the cutting edge of civilization here. Things will change as the frontier gets tamed."

The taming process is already under way. The highways that bring so many settlers are part of the process. Just as the railroads helped tame the West of the United States, the highways are doing it here. They bring fortune-seekers, homesteaders, and booksellers. Stores and gas stations appear along the highways. Many of the new businesses here are branches of some of Brazil's wealthiest chains.

The highways are perhaps the most important feature of Brazil's frontier.

"It is the highway that has made this pioneering possible," says Walter Sallas, a bank official in Cuiabá. "Not only has it made it easier to get here, it has made it easy to get food and other things to markets in the east. Spoilage and other delays are not much of a problem."

Many of the new homesteads are very productive.

"Here at the bank, we have no qualms about giving credit to these homesteads. Most are good workers. But more important, we know that what they produce will sell and that it will get shipped to markets quickly. These people and their homesteads are good risks."

Many of those who come are ready to begin farming immediately. Julio de Campos, governor of Mato Grosso, lauds these pioneers:

"They go to work the day they arrive. It is amazing how fast the crops come up under their tender care. They are pioneers, but they are farm experts, too, and they know what it is they want to do. They want to farm."

In Mato Grosso and Mato Grosso do Sul, the main crops are soybeans, rice, sugar, corn, and beans. The soybean saga is perhaps the most exciting agricultural achievement on the frontier.

Five years ago, neither state produced soybeans. Today Mato Grosso raises some 7 percent of Brazil's soybeans, and Mato Grosso do Sul another 18 percent. Both states expect to double their production in 1985 and 1986. Soybeans have become one of Brazil's chief exports.

Further north in Amazonas State, it is a similar story. Sugar, rice, and spices, together with native Amazon fruits, are the main farm products. Homesteaders with 250 acres — considered good-size farms here — are turning in cash crops the second year on the land.

But there are concerns. The surge of population into previously untapped wilderness is beginning to take a toll on the region's ecology. Some of the farming techniques are primitive. Over the long range, such practices as slash-and-burn land-clearing could ruin the soil, agricultural scientists say.

"These are fragile soils and if maltreated they may give out in a year or so," says agronomist Hélio Barbosa da Lima. "That doesn't have to happen and I know many good farmers who are using modern machinery and using lime and phosphate and other fertilizers to give nutrients to the soil."

"Ah, but I know other farmers who don't care,

don't know better, and they are killing the soil."

The problem, of course, is that the human tide is clamoring for land and there are not enough experts to help the new farmers, nor are all parcels of land the same.

"It may get better as time goes on, but in the meantime we will lose a lot of potentially good land," says Mr. Barbosa da Lima.

Other casualties of the new farming boom are the Indian tribes on Brazil's frontier. Tensions between the pioneers and Indians are rising as soil runoff from some farms pollutes Indian water sup-

plies. And there have been Indian reprisals against settlers who have moved onto lands the Indians claim as their own.

Colonization official de Aguiar says that while pioneers "are finding life here harder than they expected, they are proving generally to be good workers. The new homesteaders in Amazonas State, who have come here in the last five years, are responsible for the quadrupling of agricultural production in the state during these years."

"I would not be surprised if we have another quadrupling in the next five years."

## Pioneer explains why he moved into the jungle

By James Nelson Goodsell  
Staff writer of The Christian Science Monitor

Maracajú, Brazil



R. NORMAN MATHENEY — STAFF

**R**OBERTO Wurtheim, college graduate, family man, and fourth-generation German Brazilian, is typical of Brazil's new breed of frontiersmen.

A "gaucho" from the cattle and grain lands of southern Rio Grande do Sul State, he and his family are homesteading a 5,000-acre patch of rolling countryside here, planted largely with soybeans.

Like frontiersmen the world over, the Wurtheims left behind a familiar way of life that had suited three generations of Wurtheims before them.

Selling off a 500-acre farm in their native state, they bought this sprawling spread in an area of Brazil that is suddenly opening up to a new breed of homesteaders. Those coming to Mato Grosso include many Brazilians of German ancestry like the Wurtheims.

Until a decade ago, there were few roads and few conveniences in this wilderness.

Now roads crisscross the area. Pioneers are moving in daily. And as they do, land prices are soaring.

"We got here just in time," says Mr. Wurtheim. He adds: "I doubt that I could have afforded this land if I had waited another year or so. I would probably have had to go even further north to find what I could afford."

As it was, the Wurtheims came 1,500 miles north to their new land — the sort of trek familiar to generations of homesteaders the world over. But today's frontiersmen make their moves with an ease that would astonish pioneers of a generation ago. Gone are the days of the covered wagon, the walking into the wilderness.

The Wurtheims — Roberto, his wife, Celia, and their four children, together with assorted pet dogs and cats — came here three years ago in their new Brazilian-made Chevrolet and a rented Ford pickup truck that brought most of their household belongings.

Getting the land ready for cultivation, however, has been a lot more like traditional pioneering. A tractor that had been ordered was delayed in arrival and "a lot of the work I did at first was by hand and with a borrowed but antiquated tractor of

a neighbor," Wurtheim says. Simply preparing the land of trees, stumps, and overgrowth took a year's time. But the hard work has been worth it. "Last year's crop," he says, "was better than I expected. I earned about 30 percent more than I estimated and I think that 1985 will be equally good."

Wurtheim is one of those playing a role in Brazil's soybean revolution. Before 1970, the nation produced very few soybeans. Now Brazil is the world's second-largest soybean exporter, earning more than \$2 billion a year from the crop.

It was difficult for the Wurtheims to uproot themselves for the frontier. But they felt it was where their future was.

"We would not have come," says Roberto Wurtheim, "if I had not felt there was real opportunity for me and for the family and at the same time that we are making our mark in building Brazil."

"I don't mean to sound overly patriotic, but then again why not? But I do feel it is important to build Brazil. It's our homeland now. It's our country. It is up to us to do something to ensure its growth."

"It is our way of having a part in something we think important."

The Wurtheims were also pleased to discover that a half-dozen of the nearest 15 farms are owned by other German Brazilians, most of whom still speak German, in addition to Portuguese.

"We spoke German at home as a matter of course as I was growing up," says Wurtheim, "but we use Portuguese in our household today."

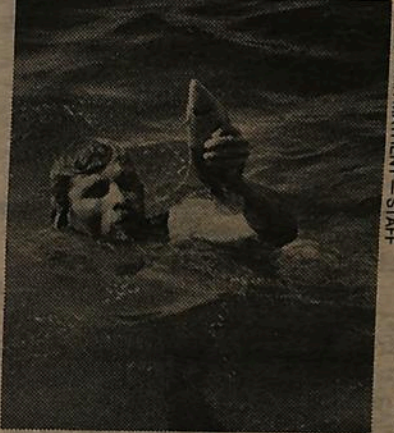
The Brazilian government officials in Brasília, the capital, estimate that 200,000 settlers a year are moving into areas like Mato Grosso and Rondônia — still sparsely populated regions.

It is an area of almost a million square miles but so far it has a population of less than 3 million, according to Heitor da Sousa, an official in Campo Grande, capital of Mato Grosso do Sul.

"We expect a continuing influx over the next 10 years," he says. "This is where Brazilians with vision want to go."

That may be too chauvanistic a view, for many prefer life in the eastern industrial and cultural centers. But for many adventurers and stout-hearted souls, the frontier is the place to be.

**Gone are the days of the covered wagon. The Wurtheims — Roberto, his wife, Celia, and their children, dogs, and cats — came to the Amazon in their Ford pickup. They came with a dream to help build Brazil.**



R. NORMAN MATHENEY — STAFF



JOHN LITTLEWOOD

Top: Brazilian carries water on her head. Center: Diver catches fish with his hands in river. Bottom: Children playing.



may be other found to lure the for the moment, the world's most frontier." reform official

RONDONIA FRONTIER TOWN/KIMBER SEN/AGIL

# \$1 Billion Venture in Amazon Is Given Up by U.S. Financier

from Dori  
19-I-182

By WARREN HOGE  
Special to The New York Times

1967-1982

THE NEW YORK TIMES, FRIDAY, JANUARY 15, 1982

RIO DE JANEIRO, Jan. 14 — Daniel K. Ludwig, the wealthy American shipping executive and financier, is abandoning his epic billion-dollar development project in the Brazilian Amazon.

A group of top Brazilian banks, insurance companies, contractors and investment houses, acting under strong summonses to patriotic duty from Government leaders, has agreed to take over the combined forestry, mining, agricultural and cattle undertaking situated on a remote jungle tract roughly the size of Connecticut.

## A Passion for Secrecy

Perhaps the largest and most costly entrepreneurial effort ever made by one man, the project, known as Jari, never succeeded in breaking free of the jungle fastness that has swallowed up other Amazonian ambitions or in liberating itself from the clutch of nationalistic sensitivities and Government bureaucracy.

Another contributing factor was Mr. Ludwig's temperamental management style, which resulted in more than 30 changes of project directors in 14 years, and a passion for secrecy that gave rise to widely circulated rumors that he was running slave camps, creating a new nation with its own armed forces and laying waste to the world's greatest rain forest.

"He wasn't crazy, he was cursed," said Elio Gaspari, a political analyst in a column in the daily *Jornal do Brasil*. "The real point is that the rational economic development of the Amazon

Continued on Page D4, Column 4

wasn't a good deal for Daniel Ludwig, and when a deal isn't good for Daniel Ludwig it's hard to imagine anyone else sinking that kind of money in the same spot."

Though Mr. Ludwig's failing health is being cited officially as the reason for his decision, the 84-year-old American billionaire had warned more than a year ago that he would begin closing down Jari if the Government did not give him financial relief and resolve persistent bureaucratic problems.

National leaders did not come forth with the assistance Mr. Ludwig was demanding, but they organized to prevent serious impact on the foreign investment community should he carry out his threat.

Camilo Penna, the Minister of Industry and Commerce, told the Government that he was persistently questioned about the matter by American businessmen when he visited the United States last June. Word that the heirless Mr. Ludwig was ailing spurred efforts in Brasilia to find a way for national interests to gain control of Jari.

Under the arrangement to be signed later this month, a pool of up to 25 Brazilian companies, the Banco do Brasil and a 75-year-old Brazilian industrialist who is a friend of Mr. Ludwig will come up with \$280 million over the next three years to take Jari off Mr. Ludwig's hands.

## Bank Assuming Foreign Debt

The industrialist, Augusto Azevedo Antunes, is buying the project's kaolin mines for \$40 million. Business leaders have pledged \$60 million between now and 1985, and the bank will assume Jari's \$180 million foreign debt and convert it into preferred nonvoting shares in the new company to be formed.

According to the prospectus for the new company, Mr. Ludwig invested \$863 million in Jari since purchasing the land for \$3 million in 1967. At 1981 prices, the document said, the investment amounts to \$1.15 billion.

The agreement stipulates that Mr. Ludwig or his Swiss-based cancer research institute will receive 5 percent of the dividends starting in 1987, then 4 percent in 1997 and 3 percent from 2007 until the contract's conclusion in 2021.

That presumes that Jari will become profitable, a forecast the Brazilian business community is adopting as a national article of faith even though it was only at Government insistence that they became involved. In their

favor is the fact that a Brazilianized Jari will receive Government benefits that were denied Mr. Ludwig because he was a foreigner.

In recent weeks heads of companies that include some of the best-known names in the Brazilian private sector were prodded to participate by Antônio Delfim Netto, the Minister of Planning and the undisputed director of the Brazilian economy. Fifteen have already entered the arrangement, and there appears no doubt that the minimum of 20 needed will be reached.

## 'Service to the Nation'

Leonídio Ribeiro, president of the South America Insurance Company, said Mr. Delfim had told him in a phone call that it would be "a service to the nation." Antônio Carlos Almeida Braga, president of the Atlântica Boavista Group, a life insurance company, said he had joined up "out of obligation." He added: "The Government thinks it's necessary, that I have to do it, and so I'll do it. I didn't spend 10 seconds reading the proposal. I accepted, and that was that."

The Government has promised to begin paying for services for the more than 30,000 people who live near the site, Mr. Ludwig complained that this "infrastructure" was costing him \$5.5 million a year.

He leaves behind an awesome physical plant in what was forbidding jungle. About 48 hours by boat from the Amazon River port of Belém, Jari has 2,700 houses, an airport, schools, supermarkets and hospitals in a configuration that borrows a little from boot camp and a bit more from American suburbs. It also boasts two substantial river bank slum areas that have aroused nationalist sentiment against Mr. Ludwig.

There are more than 3,000 miles of road, a 37-mile-long freight railway, a deep-water port and a \$200 million pulp mill 17 stories high and three city blocks long that was built in Japan and floated on barges for 17,000 miles, across the Indian and Atlantic Oceans and up the Amazon to Jari.

Plantations of melina, pine and eucalyptus trees occupy 287,000 acres of the nearly four million acres that the newly created company will be taking over. There are 4,900 head of cattle, 6,400 buffalo and 86,500 acres of rice fields.



The New York Times/Jan. 15, 1982

The location of Jari in the Brazilian Amazon, the billion-dollar development project to be abandoned by Daniel K. Ludwig.

# TUESDAY'S



LUDWIG

In one fell swoop yesterday, Brazil ended **Daniel K.** (for Keith) **Ludwig's** dream of a corporate Amazonian empire and removed him from the elite status of the world's billionaires, when it took over his mammoth jungle project called Jari. Ludwig, who is so reclusive that the only available photo of him was taken when he was about 50, (he is now 85), and who gave his last interview in 1931, had tried to carve a 6117-square-mile forestry preserve out of the Amazon basin to solve the world's pulpwood shortage. But his secretiveness, which alienated the Brazilian government, plus tropical tree diseases that ravaged his 4-million-acre plantation, wrecked the project, and yesterday a group of Brazilian firms took over Jari. Ludwig's staggering \$500-million loss effectively topples him from the billionaire category, but the man who started out at age 11 by renting out a beat-up motorboat and built a world fleet of supertankers, repeatedly told critics: "I came into this world with nothing. I might as well leave it the same way."

from Dori 6-II-'82

# Pope Triumphantly Ends His 12-Day Visit to Brazil

By WARREN HOGE

Special to The New York Times

1980 VII

MANAUS, Brazil, July 11 — Standing in a white cassock on the sunswept quarter-deck of a 200-foot Brazilian Navy frigate, Pope John Paul II led a motley waterborne parade of Amazon boats up the world's largest river today in a stirring close to his 12-day journey to Brazil.

Horns sounded, festive rockets left white puffs in the blue sky, helicopters swept overhead and tens of thousands of people who had thronged aboard boats strung with gold and white pennants waved as the frigate made its way through the flotilla.

On the outskirts of Manaus four nuns in white habits raced excitedly down a hillside from a chapel to hail him. When the river procession entered the harbor, thousands were jammed on docks and shorefront streets, and firecrackers popped above the tin roofs of shantytowns. Many of the river craft had been slipping into Manaus all week from communities reachable only by water, and it appeared that everyone who could possibly pile on them did.

A bishop held a blue and gold beach umbrella with the trademark of a popular ice cream on it to shade the 60-year-old Pontiff from the sun.

## Largest Roman Catholic Country

The farewell was triumphant, a fitting close to a trip that has excited this nation of 120 million people, the largest Roman Catholic country. Tomorrow Brazil returns to its daily routine, but there is a feeling, reflected in numerous commentaries, that it will not be the same.

In the last stop of a 13-city pilgrimage, John Paul did not slow the pace. He met with Indian groups last night, conducted an open-air mass on a scorchingly hot morning today, led the river celebration and finally delivered a farewell speech, his 43d of the journey, at the airport be-

fore boarding his plane for the 10-hour flight to Rome.

In his meeting with the Indian groups, he got first-hand exposure to their anger at what they regard as continuing abuse of their people and traditions by the authorities. While there were six million Indians here when the Portuguese settlers arrived 480 years ago, there are only 210,000 today. In this century alone 90 Indian nations have disappeared.

## The Hazards of Development

The Indians are imperiled by Government plans to develop the Amazon that have resulted in road building and subsidies for large businesses interested in opening up tracks for logging and cattle grazing. Priests and nuns have been caught up in clashes involving the Indians, several at the expense of their lives.

"When Brazil was discovered we were a great nation," said Marçal de Souza, an Indian speaking to the Pope in a presentation on the balcony of the local Archbishop's house. "Today we inhabit the margins of this country with no way to live. Even our very survival is in danger as we are being murdered on this land, our land of this Brazil that is called a Christian country."

Another Indian told the Pope that he always carried a tape recorder with him to "preserve the white man's false promises."

Luis Pereira, still another spokesman said: "We are being massacred, exploited and expelled from our territory. We are being finished off by projects, businesses that take our land and throw us out, exterminating our cultures and robbing us of our rights."

The Pope listened to the speeches and replied: "I entrust to the public authori-

ties and others in a situation of responsibility the wishes expressed in this meeting with you. With all my heart I hope that you, as the first inhabitants of this land, will obtain the right to live in peace and tranquillity. May you not suffer the true nightmare of being removed for the benefit of others. May you remain secure in a living space that is the base not only for

your survival, but for the preservation of your identity as a human group."

Tonight the Pope appeared before his last crowd in Brazil, a boisterous send-off party at the airport. For the only time in the trip he showed impatience at their insistence on chanting slogans and singing songs as he waited to speak. He

looked grim as he motioned them repeatedly to be silent.

Once allowed to speak, he relaxed and left them with a smile and a wish: "Your doors, that were opened to me with such love and confidence may remain wide open to Christ. This will be my greatest joy."



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## Inside

Uruguay  
Debates Amnesty  
for  
Political Prisoners

3

LP Document:  
Cuban  
"Theology of  
Reconciliation"  
Proposes  
New Church  
Reflection,  
Practice

5

Nicaraguan  
Sugar Plant  
Promises  
Self-sufficiency

7

Testimony--  
"Blessed are...?"  
Ronaldo Muñoz

3

Resources--  
El Salvador

4

News Briefs--  
• Mexico  
• Peru

7

## Pope Urges Structural Change, Assails "Ideologies"

By Peadar Kirby  
& David J. Molineaux

Lima (LP)-- During last week's visit to Venezuela, Ecuador and Peru, Pope John Paul vigorously addressed social, political and ecclesial themes. His words, offered in some 40 sermons and addresses, gave a new glimpse into his vision of the church and the world on the threshold of the third millenium.

The journey was essentially pastoral, but pastoral in the widest sense. Speaking to workers, poor campesinos, indigenous peoples and slumdwellers, John Paul repeatedly voiced passionate concern over the problems of hunger, poverty and extreme class divisions that plague the peoples of the region. In Caracas he deplored the "selfish luxury" of the indifferent rich, and in Cuzco he referred to the "ostentatious and wasteful affluence" that coexists with a poverty that leaves great sectors of the country without the "indispensable minimum needed in order to live in dignity."

The pope referred many times to the need for inner, personal renewal; but time and again he coupled this insistence on conversion with the call for structural change in the social and economic spheres.

### Liberation theology

Because of recent controversy over liberation theology (LP, May 10, Sept. 27, Nov. 1 & Dec. 6, 1984), observers were attentive to possible references to the theme. In Caracas, the pontiff reproved "those who disfigure the Gospel message, using it at the service of ideologies and political strategies" as well as those who announce "not the truth of Christ, but their own theories." Some saw both phrases as veiled references to the theology of liberation. In Peru, the birthplace of liberation theology, John Paul referred to "re-readings of the Gospel in code words that are not ecclesial but are adjusted to interpretations inspired by fashion or by sociopolitical visions," and warned that

"in this way the service of the Word becomes the service of confusion, or even of lies."

Asked about these remarks, Peruvian Father Gustavo Gutiérrez, called the father of liberation theology, denied that they referred to his writings. He pointed out that the pope's only explicit mention of liberation theology was in several remarks strongly supporting the Peruvian bishops' recent document on the subject (LP, Dec. 6, 1984)—a document that was, in his words, "rather favorable" toward liberation theology.

### Violence and social change

Of the three countries John Paul visited, Peru is suffering the most serious

## Brazil: Bishops Launch Hunger Campaign

Sao Paulo (LP)-- The Brazilian Bishops' Conference (CNBB) has chosen "Bread for the Hungry" as the theme for this year's Fraternity Campaign, as well as for the 11th National Eucharistic Congress to be held this July in the state of Sao Paulo.

In launching the campaign, the bishops pointed out that families living on one minimum salary of \$50 a month can only be living in a state of permanent hunger. This "hidden hunger", say the bishops, is suffered by almost 70 percent of all Brazilians and is the result of "structural injustice."

According to a 1981 World Bank report, only 33 percent of all Brazilians consume the minimum of calories necessary for a balanced diet; the other two-thirds are undernourished. UNICEF calculates that 53 percent of all Brazilian children under age six fail to receive the daily requirement of calories and proteins necessary for normal development.

Brazil is one of the world's largest food producers but the production of

# Post-colonial Caribbean Searches for Identity

By Rickey Singh & LP Staff



Bridgetown, Barbados (LP)— In the wake of the failure of Michael Manley's socialist experiment in Jamaica (1972-80) and the abrupt termination of

the Grenadian revolution in 1983, the 13 English-speaking states of the Caribbean continue to search for a model of development that can adequately confront the legacies of colonial rule.

With a population of just over five million spread over its many tiny islands, the English-speaking Caribbean continues to suffer from the twin burdens of unemployment and illiteracy. While economic and social indicators do not show the critical problems suffered by most Latin American countries, they are serious enough to worry all the governments of the region, regardless of their political persuasions.

Within the Caribbean Common Market (CARICOM), which groups all the English-speaking states, the nation with the lowest unemployment rate is oil-rich Trinidad & Tobago, with a rate of 12 to 14 percent. However, the average is between 25 and 40 percent on most of the islands. Illiteracy rates range between 30 and 40 percent.

Left-wing movements have proved unable to attract widespread support in the region. But the inability of regional governments to fund economic development by attracting private investment or through aid packages from the United States, such as the Caribbean Basin Initiative (CBI), is also making some leaders skeptical of a solution along strictly capitalist lines.

## Dependency on multinationals

In practice, however, the Caribbean economy has become heavily dependent on multinational companies, particularly those based in the United States. While they have traditionally dominated the production of sugar, cocoa, coffee, bananas, bauxite, petroleum and other raw materials, the multinationals have recently moved into manufacturing, particularly in the clothing and electronic industries.

Despite the tax breaks and infrastructure provided for them by host governments, this reliance on multinational companies has proved unable to halt rising levels of unemployment,

while wages in the region are one tenth of those paid for similar work in the United States. Furthermore, countries like Trinidad & Tobago, Barbados and Antigua have to import some 80 percent of the food they consume, while multinational companies export some 80 percent of the food they produce.

As Prime Minister James Mitchell of St. Vincent stated recently: "The big question is: Where do we go from here? Which are the governments and agencies really interested in helping us face up to the problems of poverty, unemployment, economic imbalance and the feeble infrastructure that we possess?..."

## Call for new development model

It was to this problem also that one of the English-speaking Caribbean's foremost economic planners, William Demas, addressed himself in a recent speech on the region's future. Demas, who is currently president of the Caribbean Development Bank and a former secretary general of CARICOM, called for an end to the "negative perceptions" the region's people have of themselves—a self-contempt he believes is rooted in centuries of British colonialism.

"There is the need to remove some of the undesirable legacies of colonialism and external dependence, in terms of lifestyles and also in thought and in values," he said. He called for the evolution of "indigenous and relevant philosophies and ideologies."

Demas urged the region's governments, organizations and people to cast aside their negative self-perceptions and become "more self-confident and more self-reliant in technological and economically productive activities." He challenged the private sector to display "energy, enterprise and readiness to take risks" and to shift its emphases from importing to satisfy consumer needs to producing for export.

Demas clearly shares the view of a number of governments that progress can be spurred without resorting to socialist models of development. At the same time, however, he insists that the private sector has not yet demonstrated the required vision or offered creative alternatives in the post-independence period; the region has not yet found a model of development that can guarantee a livelihood for its own people. □

## News Briefs

**BRAZIL.** More than 1,000 landless farmworkers meeting last month in the southern city of Curitiba issued a document calling upon President-elect Tancredo Neves to enact a comprehensive agrarian reform. The 126-page document, which was prepared with the help of the Brazilian Bishops' Pastoral Commission on Land, lists the names of 236 peasants who have been killed in the last three years and identifies those suspected of the assassinations. Most of the victims were temporary farmworkers ("boias frias"), Indians and prospectors looking for gold and other precious metals. The farmworkers' report points out that "although there is no land for the people, 40 large landowners in the Amazon own more than 26 million hectares of land."

**GUATEMALA.** The New York-based human rights group Americas Watch has warned that the U.S. Congress will be breaking the law if it approves the Reagan administration's current budget request for Guatemala. The request—\$25 million in economic aid, \$10 million in weapons sales and \$300,000 for training and education—is, according to the human rights organization, a violation of the Foreign Assistance Act which prohibits giving aid to governments systematically violating human rights.

According to Americas Watch, "Guatemala continues to be a nation of prisoners." Torture, killing, and disappearance are still common occurrences, and millions of peasants are under strict surveillance by being forced to participate in civil defense patrols or to live in "strategic hamlets."

**EL SALVADOR.** Two high-ranking Salvadorean military officers were recently awarded the Legion of Merit medal by President Ronald Reagan. At the decoration of Defense Minister Gen. Carlos Vides Casanova and Armed Forces Commander Gen. Adolfo Blandon, Reagan stressed the officers' military professionalism, their support for democracy and their initiatives toward improving relations between the two countries.

Several days before, the Salvadoran army had received three new Dragonfly warplanes and four more Huey helicopters from the U.S. for its war against FMLN insurgents.

## Indians kill two men in Brazil

BRASILIA, Brazil (UPI) — Fifty Indian warriors using poison-tipped arrows attacked six geologists working in the remote Amazon region, killing two men and injuring another, a government official said Saturday.

"They were probably giving a warning to stop penetration of lands they control," said Apoena Meirelles, a spokesman for the government's Indian Foundation.

Meirelles said the 50 Indians Friday attacked a camp on the Jameri River, 1,200 miles west of Brasilia, where the six geologists for the Pompeia Mining Co. were working.

"The Indians shot off a volley of arrows then scampered into the

forest," he said.

Two men died from wounds inflicted by the poison-tipped arrows, he said.

A third man, who was struck with the arrows in both legs, was reported in fair condition at a government hospital in Guajara-Mirim, a river outpost near the mining camp.

Meirelles said he believed the Indians may belong to the feared UAU-UAU tribe inhabiting border regions between Brazil and Bolivia, who were only discovered by the Indian Foundation 11 years ago.

The warriors of the UAU-UAU Indians have been responsible for a series of killings of government agents and settlers in the Amazon region, he said.

## Development Policy, Forests, and Peasant Farms: Reflections on Huastec-managed Forests' Contributions to Commercial Production and Resource Conservation<sup>1</sup>

JANIS B. ALCORN<sup>2</sup>

*The Huastec Indians of northeastern Mexico manage their forests in an indigenous system that integrates commercial and subsistence production. Elements of primary and secondary forest coexist with introduced species in this diverse silvicultural structure which complements the swidden and permanent agriculture fields of the Huastec farmstead. The forest's direct production of the food, timber, and fuel resources discussed here buffers the Huastec peasant family against market fluctuations and the failed harvest of a single crop. The Huastec system of forest management offers an alternative pattern to the agroforestry and plantation schemes now being suggested for development in the tropics. It is an alternative that provides protection for wild genetic resources while it contributes to the combination of commercial and subsistence agriculture so important for the successful modernization of peasant agriculture. The documentation of this system demonstrates that ethnobotanists and economic botanists have an important but unrealized role to play in the protection of biotic resources and in the development of sustained yield agroecosystems for peasants. The contributions of ethnobotanists are particularly valuable because they can find where and why useful wild species persist in agroecosystems. A greater effort to direct the attentions of policy makers to the value of ethnobotanical knowledge is needed.*

The Green Revolution has failed to fulfill all it promised; peasants have been displaced from smallholdings and their living standards continue to fall (e.g., Dahlberg, 1979; Frankel, 1971; Humphrey and Buttel, 1982; Perelman, 1977; Scott, 1976; Sharma, 1973; Taussig, 1978; Vermeer, 1976; Wilkes and Wilkes, 1972). Deforestation is proceeding at disastrous rates, and invaluable genetic resources are rapidly being lost (Myers, 1980; Oldfield, 1984). What have economic botany and ethnobotany to offer policy makers determined to halt these trends? Are the goals of these disciplines simply academic—to capture on paper data about the uses of exotic plants, investigate the properties of these plants, and develop “new” economic plants isolated from the natural and social contexts of the agroecosystems into which they are to be integrated? Can economic botanists and ethnobotanists do no more than document genetic resources and protest against their loss? Or can they play a critical role in solving the twin dilemmas of genetic resource conservation and peasant agriculture development?

In an attempt to learn from the Green Revolution's failures, agricultural researchers have shifted their emphasis from simply developing high-yielding cultivars toward developing crops and agricultural structures that are better adapted to the natural and social conditions of peasant farmers (Baker et al., 1983; Janzen,

November that the majority of Uruguayans wish the military would go away. Convinced of the Uruguayans' loyalty, the cocky armed forces held a plebiscite on a continuation of military rule, only to be roundly defeated by a people with a long tradition of democratic values. In addition to growing economic problems, the military government was badly shaken last April by a scandal that led to the resignation of a number of senior officials. The minister of the interior, the commander of the army school, Montevideo's police chief and a half-dozen colonels were caught in a loan-shark and kickback scheme run by a local gambler, who subsequently disappeared, some say into the dungeons of the army school. The proposed return to democracy is being taken seriously by Uruguay's politicians, who point out that even in Latin America, dictatorships do not last forever. The Chileans may take heart from developments in Uruguay: The generals there originally intended to stay in power until 1991, two years longer than Pinochet.

### Paraguay

In Paraguay, it would seem, dictatorships do last forever: Gen. Alfredo Stroessner, the longest reigning dictator in Latin America, is unlikely to be eliminated by any but natural causes. At 69, Stroessner's health is reportedly not good, but the wily general has lost none of his repressive faculties, which have recently been directed at peasant leaders and critical journalists. Although shaken by the murder of fellow dictator Anastasio Somoza, Stroessner is in little danger of suffering the same fate, having eliminated most of his enemies during a twenty-seven-year reign of terror. Unequaled in the extent of its corruption even by the Haitian government, Stroessner's regime has found new sources of bribery in Brazil's construction of the giant Itaipú hydroelectric complex on the two nations' border and in the sale of Paraguayan peasants' land to Brazilian and U.S. developers. The majority of the Guaraní-speaking people live outside the economy—illiterate and fatalistic Indians who are used as peons on the large ranches, where, according to a Paraguayan bishop, they have less value than a horse or a cow (the Indians are often referred to as *chanchos*, or pigs). Despite the work of journalists and opposition politicians, many of whom have paid for their independence in the torture chambers of Stroessner's police, the outlook for Paraguay, even after Stroessner dies, is unpromising. So ingrained are corruption and repression, says a young journalist who admits to having been bought off himself, that "the only thing people worry about is being on the right side of the next general who takes power."

### Brazil

The largest country in Latin America, Portuguese-speaking Brazil boasts the eighth-largest economy in the West. Though culturally different from its neighbors, Brazil sets the continent's pace in repression as well as in industrial development—a macrocosm of all the extremes in Latin America, its frustrations and its hopes. The region's tendency to justify its neo-fascist militarism on national security grounds originated in Brazil, which was also among the first

countries to experiment with the trickle-down theory of growth. Brazil has the highest foreign debt in the developing world (about \$57 billion) and is the Third World leader in arms manufacturing. Among its people are some of the poorest in the Hemisphere—18 million Brazilians in the drought-stricken Northeast have a yearly income of less than \$100—and some of the richest—Brazilian executives earn twice the salaries of their U.S. counterparts. Brazil's military regime, dating back to 1964, is one of the oldest in the region, a longevity that has contributed to the advanced organization of the labor movement and the progressive outlook of the country's Roman Catholic bishops. Thanks to the Church and the labor movement, Brazil's passive millions are gradually awakening to the injustices of a military-imposed system which has created dependence on the multinational corporations that control the country's industry and agriculture and are the principal source of its enormous foreign debt.

Incapable of holding down the political lid, President João Baptista Figueiredo's regime has been inching toward an opening to democracy, known as the *abertura*. Press censorship has been reduced, political exiles have been allowed to return and opposition parties have reorganized. But the *abertura* has not been to the liking of military hard-liners, who have sponsored a campaign of bombing and terrorism against newspapers and human-rights advocates and also attempted to blow up a Rio de Janeiro concert hall jammed with 20,000 people. Under Economy Minister Antonio Delfim Netto, the government has also become hostile to the independent labor movement, imprisoning several of its leaders and brutally attacking strikers. Delfim Netto is trying to implement I.M.F.-style austerity measures in order to obtain \$10 billion from foreign banks to service the debt this year, and, as usual, the first victim is labor. But to date, all that he has achieved are massive layoffs in industry and 120 percent inflation, the highest in Brazilian history.

The uncertain economic situation has increased doubts about the outcome of next year's elections for state and municipal officials, the first direct elections since the military seized power. The results will determine the composition of the electoral college, which will select the next president. The regime is trying to rig the outcome in favor of the government party, but so far the opposition has refused to cooperate. On the other side of the political spectrum, the army's right wing threatens a coup within a coup. Whatever happens, Brazil has already passed a political crossroads. No amount of repression can destroy the essential lesson that has been learned by hundreds of thousands of poor people in unions and church organizations: "We have a right to participate in national life, too," a slum mother in São Paulo pointed out. That challenge is not limited to Brazil but extends to all of Latin America and the Caribbean, where new groups are emerging to question the centuries-old order of repression and poverty. While their methods differ, all are seeking indigenous solutions to economic dependence and political disenfranchisement. Ironically, President Reagan's policies will merely accelerate the process.

pledged to upholding democracy, while ultraright-wingers have formed the "Argentine Patriotic Association." Also in the background are paramilitary groups that still operate beyond the government's control. They threaten, harass and occasionally even kidnap political and labor leaders.

#### Trade union struggle

In the struggle for trade union democracy, the government has been obliged to negotiate with the General Worker's Confederation (CGT) after a proposed union election law was narrowly defeated in Congress last year. The law would have reduced the seniority period required for the election of union leaders and required that a fourth of union executive councils be made up of opposition leaders (*LP, March 1, 1984*). The government's subsequent agreement with the CGT authorized unions to elect their leaders by direct vote, but gave the union bureaucracies certain advantages. The Peronists have viewed these moves as an attempt by Alfonsín to fragment the labor movement, but others see it as the beginning of a process that would make the trade unions more reflective of rank-and-file demands.

The government has also worked vigorously at polishing up the country's international image. The biggest step in this direction was the agreement with Chile over the Beagle Channel boundary. Argentina has agreed to surrender the islands at the mouth of the channel in exchange for a reduction of military tension and the increase of trade between the two countries. The proposed agreement was subjected to a historic "popular consultation" in which 70 percent of the voters supported the government's plan.

Alfonsín is also negotiating with Great Britain over Argentina's future ties with the Malvinas Islands. But up to now, the Thatcher government has refused to regard the sovereignty of the islands as a negotiable point.

There have been changes during the last year that could transform the country's political situation. The split in the Peronist movement, with half of the party refusing to accept leaders elected by the other half, has reduced its political influence. This division has permitted internal alliances among revolutionary youth, local *caudillos* from poor provinces and diverse factions opposed to attempts by right-wingers to take over the party.

The Radical Party has its own divisions, with many young people and "Alfonsínistas" working for a Peronist-Radical accord while the "old guard" strongly opposes such an alliance. It is still too early to say whether the Radicals can attract enough Peronist dissidents to forge a new movement, but analysts here are predicting a period of political realignment that should indeed make the Argentine political scene a lively one for some time to come. □

First of a two-part analysis:

## Brazilians Count Costs of Failed Military Project

By Vittorio Bacchetta



Rio de Janeiro (LP)-  
"Bon dia, democracia." This short phrase, painted on a building on Brazil's election day,

expressed the delight of millions of Brazilians at the victory of the opposition candidate as the country's next president.

A recent opinion poll taken by the daily *O Globo* showed that 66.6 percent of the population believes that the president elect, Tancredo Neves, will be capable of handling the country's economic problems. However, when Neves takes over on March 15 he will be faced with a number of acute national problems inherited from 21 years of military government.

Since 1964, when the military took power, Brazil's population has grown from 76 million to 130 million. Its GNP has increased from \$80 billion to \$267 billion; exports went up from \$1.4 billion to \$22 billion; and the foreign debt rose from \$2.86 billion to \$100 billion.

With an industrial base nearly as sophisticated as that of Europe, Brazil today is the seventh or eighth most powerful economy in the capitalist world and the fourth largest exporter of grains. But it also has the sixth largest number of undernourished people, and some 10 million unemployed out of a work force of 47 million. More than half of those who have work receive a monthly salary of \$60 or less. While it has some of the most sophisticated technology in the world and in spite of its rampant consumerism, Brazil all too visibly displays a growth in misery, disease and violence.

Vittorio Bacchetta is a Uruguayan journalist living in Rio.

The country has now reached a crossroads in its history: Faced with a change of government that will put an end to military rule, Brazilians are now in a position to evaluate the results of the model of development the government has followed for the last two decades.

#### The military project

The regime installed in power by the armed forces in 1964 put into practice, in a coherent and continuous way, an overall political project that had been drawn up in Brazil's Superior War College (ESG). Based on a well-defined political outlook, the project consisted of a number of key tenets:

The first of these was the need to restructure the economy. Capital was favored over workers, and a predominant role was given to the state. Attracting foreign investment became the basis for national development, as military planners sought to make Brazil into a major world power—albeit one subordinate to U.S. economic interests.

To achieve this objective, a highly centralized system of government was instituted with the backing of the armed forces. Theoretically, the economic and political principles of liberalism were not abandoned and certain forms of representative government were maintained, such as a national congress and state and municipal assemblies. But the power given to these entities was highly restricted and subordinated to that of the central government.

In addition, the internal apparatus of repression was strengthened—especially in the media and in the gathering of intelligence. The goal was to eliminate all political opposition and to clamp down on political movements that might threaten the military's long-term plans. This outlook was based on the Doctrine of National Security,

## *The CS cause:* Helping smaller societies live with the modern world.

To explore and develop the world's resources, the forces of modern industrial society are extending into previously untouched corners of the globe.

In their path stand smaller, once isolated societies whose contact with the outside world often visits upon them a host of disasters: disease, exploitation, relocation, impoverishment, loss of identity, even death.

Cultural Survival was founded in 1972 to help these vulnerable people survive the rapid changes created by the encroachment of governments, corporations, and others. Such contact is inevitable, but destruction is not. To survive, remote societies need time to adapt to changes.

Toward that end, Cultural Survival supports projects on five continents which help indigenous peoples retain their rights and culture as they learn to live with the modern world.

## *The CS effect:* Large victories for smaller societies.

Cultural Survival provides funds and expertise for a wide range of projects designed and implemented by tribal people and ethnic minorities.

These projects include:

- Establishing land rights for 36 Achaual Indian communities threatened by expanding petroleum exploration in northern Peru
- Developing a unique health care program in Colombia that integrates traditional shamanistic practices with modern medical science
- Supporting a cultural center and workshop for Mexico's Huichol to preserve their sacred art and market wood products
- Providing textbooks for a bi-lingual education program developed by the Amuesha in Peru
- Promoting an informational and educational campaign to aid Kurds in Turkey, Syria, Iran, and Iraq
- Opening a cultural and education center for the Sherpa in Nepal's Himalayan region
- Creating a center for traditional culture among the Chincheru in highland Peru



**Cultural Survival: *Its cause and effect***



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You have been specially chosen to participate in a program that could prevent a global crisis.

Because you care about the quality of life on our fragile planet, we urgently need your answers on the enclosed survey. They will guide Conservation International's worldwide campaign to alert concerned citizens like you about the devastating consequences of tropical rain forest destruction.

Dear Friend:

A massive change is burning its way through the earth's environment.

The band of tropical forests that encircle the globe -- from Africa to Asia to the Americas -- is being cut down and burned to the ground at an alarming rate.

... 27 million acres of tropical forest is cleared each year mostly by large scale, misguided "development" projects.

You may well ask why the destruction of a tropical forest thousands of miles from your home should be of concern. Let me give you four good reasons.

REASON #1: humanitarian concern. Though the people of the tropics inhabit lush and beautiful surroundings, for the most part, they face a life of poverty, hunger and disease.

To stem this tide of desperation, huge "economic development" projects are attempting to convert forest land into farm land. The result is devastating. The rich nutrients that give life to a tropical forest cannot support farm crops for more than a few seasons.

When these meager crops fail, the people of the tropics are forced to cut deeper and deeper into the forest in an endless cycle of destruction.

# WORLDWIDE PACT SOUGHT ON OZONE

## Congressional Members Urge Support for the President in Parley in Vienna

By PHILIP SHABECOFF

Special to The New York Times

WASHINGTON, Feb. 18 — Members of Congress called today for an international agreement to protect the earth's ozone shield and voiced support for newly proposed legislation to gradually eliminate Americans' use of chemicals that destroy atmospheric ozone.

Ozone in the upper atmosphere shields the surface of the earth from cancer-causing ultraviolet radiation from the sun. There has been mounting scientific consensus that the atmospheric ozone is being destroyed by chlorofluorocarbons, chemicals used in refrigerants, packaging, foams and aerosol propellants, and several other man-made chemicals.

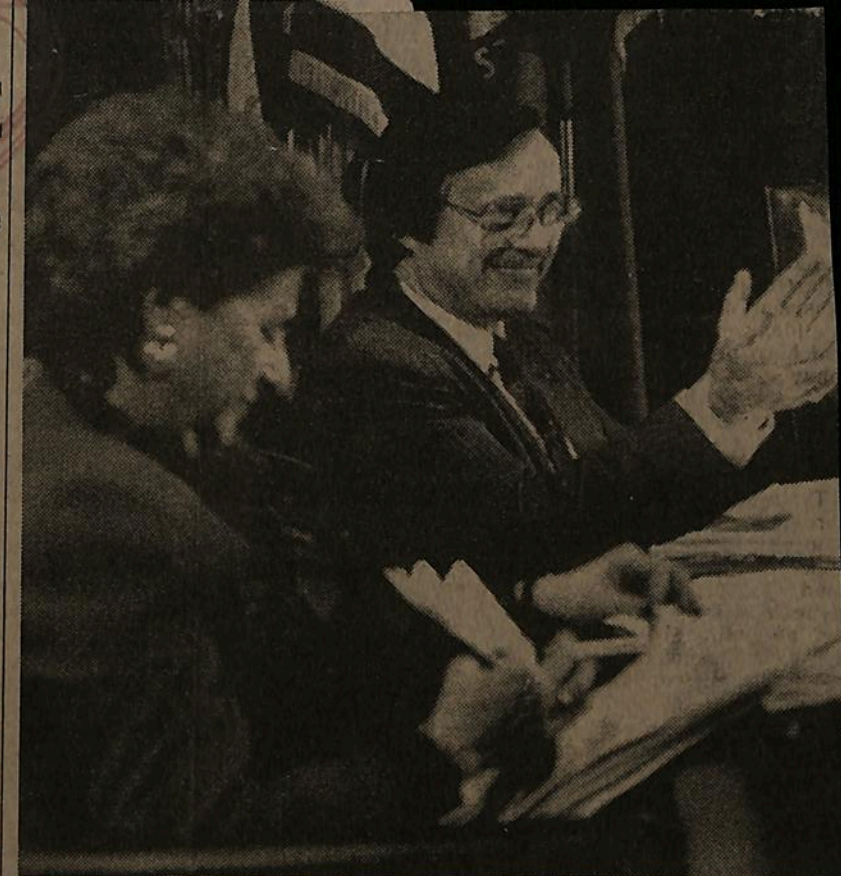
At a news conference on Capitol Hill today, Senators and Congressmen from both political parties said they would push a Congressional resolution to support the President in forthcoming negotiations in Vienna aimed at protecting the ozone shield.

Representatives of the industrial nations will meet in the Austrian capital Feb. 23-27 in an attempt to reach an agreement to freeze current production levels of chlorofluorocarbons and to end their use over time. The United States made such a proposal at a meeting in Geneva in December but, while some consensus was reached on the nature of the problem, no agreement was made on further action.

Today members of Congress charged that the European Community, Japan, and the Soviet Union were dragging their feet on an international agreement to protect the ozone shield in order to serve their own narrow economic self-interest.

Senator Timothy E. Wirth, Democrat of Colorado, said at the news conference that a Congressional resolution would send "a signal to the European Community and Japan that the U.S. Congress views the threat of ozone depletion as a very serious threat to the global environment. The risks of inaction are enormous."

Separate but similar bills to regulate chemicals that deplete the ozone layer were introduced today by Senator John H. Chafee, Republican of



**BEVERLY HILLS MOVES AGAINST SMOKING:** Smiles were in evidence Tuesday night after the Beverly Hills, Calif., City Council voted 5-0 to ban smoking in restaurants and certain other public places.

From left were Vice Mayor Ben Spadaro. The meal period if it is pas

Rhode Island, and Max Baucus, Democrat of Montana. Both bills would gradually eliminate within six to eight years 95 percent of the chlorofluorocarbons that cause the most destruction, as well as two kinds of chemicals that react with ozone, both halogens containing bromine.

The bills would freeze production of the chemicals at current production levels starting in one year and would also bar all imports of products containing or made with chlorofluorocarbons.

Senator Chafee said that ozone depletion and the related problem of the warming of the earth's surface because of the buildup of carbon monoxide and other gases in the atmosphere were "monumental problems with a doomsday effect."

Warnings about the dangers of chlorofluorocarbons were first raised more than a decade ago by Professor F. Sherwood Rowland and Dr. Mario J. Molina, scientists at the University of California in Irvine. In the late

1970's use of these chemicals was barred by the United States, Canada, Sweden and Norway for most aerosol propellants such as those used in deodorants. But other countries did not follow suit and, in the meantime, the use of the chemicals in other applications grew rapidly.

Meanwhile, appearance of a mysterious "hole" in the ozone layer over Antarctica each spring, a hole the size of the United States, has prompted new fears about the impact of ozone depletion.

Increased ultraviolet radiation reaching the earth's surface through the thinning ozone shield can cause lead to skin cancer and other health problems in humans and also damage crops and forests.

Representative Henry A. Waxman, Democrat of California, said today that a recent Environmental Protection Agency draft report predicted that ozone depletion would lead to 40 million additional skin cancer cases and 800,000 additional cancer deaths in the

# Contract Scandal Shakes Brazil Chief

By ALAN RIDING

Special to The New York Times

RIO DE JANEIRO, May 15 — With doubts already being voiced about the project's cost and usefulness, a corruption scandal involving construction contracts for a \$2.5 billion north-south railroad is seriously threatening what President José Sarney had planned as the historic public-works effort of his administration.

Mocked by critics as "the train that goes from nowhere to nowhere," the railroad is intended to open up a sparsely populated and undeveloped region of central Brazil by linking Açailândia in Mr. Sarney's home state of Maranhão with Anápolis, near Brasília, 1,000 miles to the south.

But although construction was due to begin June 1, the railroad's chances of ever being built were shaken Tuesday when a São Paulo newspaper exposed in detail how 18 engineering companies had been secretly awarded contracts to build sections of the line before their bids had been opened. The contracts were hurriedly revoked a few hours after the article appeared.

With Mr. Sarney already caught in a swirling economic and political crisis, he is now expected to face intense political pressure to cancel the entire project and dismiss his Transportation Minister, José Reinaldo Tavares, an old friend and fellow native of Maranhão, who was ultimately responsible for approving the contracts.

## Compared to Past Mistakes

Yet even before this embarrassment, the railroad was being compared to the huge projects that cost the country billions of dollars during the former military Government and that proved to be of dubious economic value, most dramatically in the case of the unfinished Trans-Amazonic Highway.

In this case, the timing of the new investment had been particularly criticized, since Brazil is facing acute economic problems, with the Government

unable to maintain interest payments on most of its \$108 billion foreign debt and forced to cut spending in other priority areas.

Since an existing highway runs close to the route chosen for the railroad, some economists had complained that no adequate feasibility study was carried out to determine whether the railroad could generate the 15 million tons of additional cargo needed annually to amortize its cost after it is fully operational in 1990. They added that cost overruns could inflate the final price of the project to far above \$2.5 billion.

In political circles in Brasília, there were charges that the investment was being used to bail out several major construction companies that had been hit by the economic downturn. One of the companies, Mendes Júnior, is owned by Murilo Mendes, a close friend of Mr. Sarney, and is reportedly owed more than \$100 million by debtors.

Significantly, the leading opponent of the project is a member of the Government party, Senator Affonso Camargo, who served as Mr. Sarney's Transportation Minister in 1985. Last week, he

urged party leaders to demand suspension of the project, which he said was rife with "illegalities" and "technical errors" and would cost too much.

## Initial \$500 Million Outlay

Despite these doubts, however, just days before he resigned on April 26, Finance Minister Dilson Funaro approved an initial appropriation of 12 billion cruzados — about \$500 million — to be taken from a special National Development Fund. Since the fund's resources had already been assigned, economists asked what other projects would now be postponed.

President Sarney, on the other hand, attributed criticism to the fact that rich southern states resented major investments being made in the poorer north. Last weekend, he said in his weekly radio address that the project "is pioneering, it is needed and it is a historic work."

He added, "The future will vindicate the historic decision of beginning to carry it out."

Now, however, while insisting that new contracts will be awarded within 60 days and that the project is "irreversible," Mr. Sarney and supporters of the project have been thrown onto the defensive by the evidence published Tuesday by *Folha de São Paulo* that the first contracts to prepare the ground for the railroad were awarded without competitive bidding.

## Printed Results in a Code

The newspaper demonstrated that in its issue of May 8, the day that sealed envelopes containing the bids of 21 companies were opened, it had identified the construction companies that on Monday night would be awarded the first contracts. But to disguise the fact it had this information, it published the results in a simple code hidden in its classified advertisements.

By reprinting its "ad" on Tuesday alongside the identical official results, it demonstrated that the 18 contracts had been decided beforehand.

The plan to build the railroad involves not only irrationality, wastage, authoritarianism and personal sta-



The New York Times/May 16, 1987

The proposed railway runs close to an existing highway.

# In Amazon, Dam Is Seen As a Threat

By MARLISE SIMONS

Special to The New York Times

RIO DE JANEIRO, Sept. 5 — A giant new dam in the middle of the Amazon rain forest is about to flood millions of trees and animals, even though energy and environment experts say it should never have been built.

Now, with the rising of the waters only seven weeks away, Government agencies are quarreling fiercely over the dam.

Although one of the colossal gates has already been sealed, two agencies dealing with environmental issues have demanded that operations be slowed to insure that the floods will cause less havoc. One agency, the Government's Center for Amazon Development in Manaus, has said it is holding up the operating license until it receives assurances that a sizable number of the forest animals will be saved.

The center has also called for assistance from abroad to rescue and eventually to harbor animals. The region is said to be teeming with monkeys, agoutis, jaguars, birds and reptiles among countless others.

## Rush to Develop Wilderness

"It is a huge area of living tropical forest and the impact of the water will be devastating," said Lydia Loreiro da Cruz, a director of the center. "We would accept requests from research institutions and zoos abroad that want to get involved."

Set, in the heart of the Amazon basin, the Balbina hydroelectric dam will harness the Uatumã River, an affluent of the Amazon, and send its energy to Manaus, 90 miles to the south. It was ordered more than a decade ago by the military regime then in power, which saw the dam as a vital pivot in its rush to develop Brazil's vast tropical wilderness.

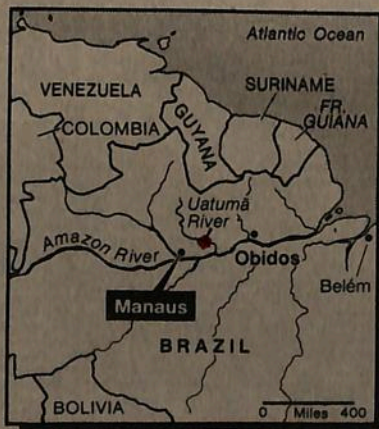
But today, after years of delay and expenses of \$600 million, it is lamented as another of the overly ambitious projects on which the military spent much money and land. Other multimillion-dollar projects that have not worked out include the Transamazonian Highway and a series of nuclear plants.

Government energy experts have said that the cost of the Balbina dam is out of proportion to the little energy it will yield. The new Tucuruí dam, which has flooded a similar area in the Eastern Amazon, can produce 15 times as much electricity. An official of Electronorte, the state-owned electric company, said that today, the Balbina dam would probably not be built.

Environmentalists have protested the building of a hydroelectric project



The Balbina hydroelectric dam under construction two years ago on the Uatumã River in Brazil.



The New York Times/Sept. 6, 1987

Dam north of Manaus would flood a tropical forest area.

in a region as flat as this. They say that to amass enough water to drive the generators, the flooded area must be unusually large. The dam will inundate close to 600 square miles, about half the size of Long Island, for its small production capacity of 250 megawatts. For a project like this, "it's the biggest puddle I've ever heard of," said Thomas Lovejoy, a senior official of the World Wildlife Fund who recently visited Manaus. Even so, the dam will fill only half of Manaus's energy needs. A future phase could flood another 300 square miles.

One argument for the dam, energy experts say, is that it will halve Manaus's oil bill. This old trading post on the Amazon bank has rapidly expanded into a city of one million people since the former military regime turned it into a duty-free zone for assembly plants. But cut off from the world by thousands of miles of jungle, Manaus's energy bill is four times higher than that of comparably sized cities.

Because of the debate over the Balbina dam, Government energy officials are also reviewing the entire Amazon energy plan. In different spots, away from the center of the basin, three large new dams have already been built, two are nearly finished and at least another three are planned.

But as long as the rush on the region continues — many Amazonian towns grow by 15 percent a year — experts agree there are no easy answers to the energy needs.

## Balance Is Easily Disturbed

Part of the problem is that the world's largest fresh water system offers few good dam sites. Much of the huge grid of rivers runs through areas with little downward slope and many ecologists say dam building provides one more example of how easily the delicate balance of Amazon nature is disturbed.

"Good places for dams are rare and almost inaccessible," said an Electronorte official. "If we put a dam in the Amazon at Obidos, we would flood Ma-

naus," 300 miles away.

Critics of the Balbina dam at the Amazon Development Center say they are trying to make the best of a bad thing. "The dam is built, this is a fait accompli," said Ms. Loreiro da Cruz. "We can only try and reduce the damage."

Two small Indian tribes in the forest, totaling 107 people, have received new lands and been promised medical assistance and education for the next 25 years.

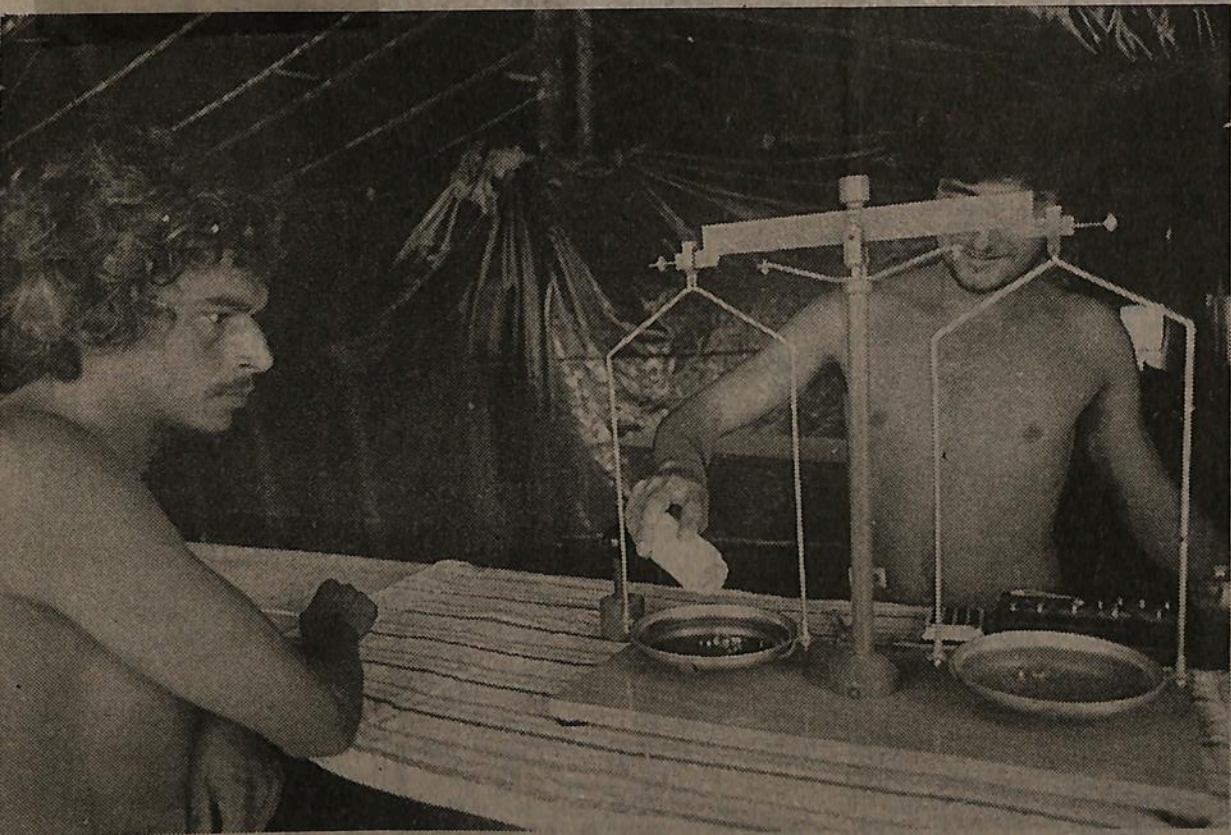
## More Animals May Be Saved

The Development Center and the Federal Department for the Environment are demanding that at least the most valuable trees in the area be cut and put to some use.

"We have asked for bids on the wood, but no one has shown any interest," said a spokesman at Electronorte.

The environmental agencies also say they want far more animals saved than planned by Electronorte, which they say allows only for rescuing the small percentage needed for scientific research. "We want much more than that," said Ms. Loreira da Cruz.

Electronorte responds that it has built tanks to save and study dolphins, manatees and otters, animals whose numbers have been dwindling dramatically in recent years. "The flooding will be very slow," a spokesman said. "We think that many land animals will be able to flee."



Agencia J. B.

At the Padeiro camp near Alta Floresta, Brazil, a prospector sells gold he has collected.

## *In Brazil, a Gold Rush Like None Before*

By **MARLISE SIMONS**

Special to The New York Times

ALTA FLORESTA, Brazil — The men of Padeiro pay for a gun, a drink or a plane ride in gold, pure gold dust, like fresh produce just drawn from the soil.

They find it beyond Main Street, which doubles as an air strip, in grains and nuggets hidden in the mud, the river gravel and the red earth beneath the forest canopy.

Padeiro is a new camp of gold prospectors outside Alta Floresta, a wildcat digging in the jungle where near-naked men are probing and grinding the soil for a chance at wealth.

They are part of a legion, now estimated at 500,000 people, who are penetrating Brazil's wild interior and

tapping the Amazon's rich deposits of alluvial gold.

With their primitive tools, they have made Brazil the world's fifth-largest gold producer. Government officials said that last year industrial mining companies produced 13 tons of gold, but that freelance gold diggers lifted an estimated 70 tons of gold from the wilderness, worth almost \$1 billion.

Brazil's modern gold rush is nearly a decade old but it is accelerating as a severe economic recession leaves more and more people without regular jobs. The gold fever has reached such a vast scale that mineral experts are now describing it as the greatest mining rush on record.

In the past year, new wildcat dig-

gings have opened. They are scattered over thousands of miles, reaching north to the rugged borders with Venezuela and Guyana and west to Colombia and Bolivia.

Like pioneers, the gold diggers have cut new trails, opened trade routes and extended the settled parts of Brazil. They move across the north and center of Brazil, exploring or following rumors of new discoveries.

"No one knows the number of camps and sites," said José Altino Machado, who heads the Federation of Independent Prospectors. "You can't keep up. They open and close and reopen again." Some camps have a few hundred people, others thou-

*Continued on Page 6, Column 1*



Agencia J. B.

The Padeiro camp of gold prospectors outside Alta Floresta, Brazil. An estimated 500,000 people are seeking gold in Brazil's interior.

## In Amazon Jungle, a Gold Rush Like None Before

Continued From Page 1

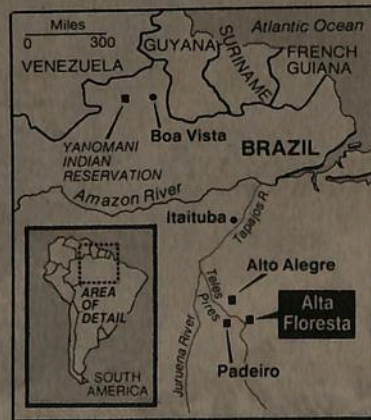
sands, he said. Serra Pelada, the biggest mine ever, drew as many as 60,000 prospectors.

The effects of this fever extend far beyond the men who strike fortunes. It has spawned networks of smugglers who take much of the bullion out of the country and trade it for dollars, weapons or drugs. Suppliers of equipment, food and alcohol as well as pilots and prostitutes have followed the camps.

"If you count the dependants and the spinoffs, the whole economy of support and logistics, some five million people are now living off the gold rush," Mr. Machado said.

The highest yield at the moment comes from Alta Floresta, a rough and muddy county seat set in a formidable rain forest. Just a tiny outpost on the cattle frontier in 1980, today it has 121,000 inhabitants and a floating population of about 80,000 gold diggers in the bush. There are also eight banks, 36 establishments that buy and sell gold, 20 drug stores, 68 guest houses and hotels and a circuit of cabarets.

Three inspectors at the tax office are responsible for monitoring the



The New York Times/April 25, 1988

The town of Alta Floresta is the center of the Amazon's gold rush.

strip by looking for wrecks," Spirit said.

The harsh life at the remote jungle camps seems an antithesis of what gold can buy. The center of the camp is usually the bar-brothel.

In the sprawling heat of the day, crews work from rafts on the river to pump gravel from the riverbed. Others blast open the earth in the diggings with high pressure water hoses. At makeshift "refineries" gravel and

Octavio Lacombe, the president of Parapanema, Brazil's largest private mining conglomerate. His company began work on a rich site south of Alta Floresta in 1986. But within a year it pulled out and sold off most of its equipment to local gold diggers.

"It was madness, they were shooting at our people," said Mr. Lacombe in his office in São Paulo. "The Government is crazy to let the gold diggers carry on. They make off with the gold, they pay no taxes. Their methods are so primitive that more than a third of the gold is lost."

### 'Only Viable Occupation'

Along the wild Juruena River, an Amazon tributary to the west of here, prospectors and a mining company are now battling over a site that the company maintains holds as much as 40 tons of gold. Although the company obtained a legal mining license here, prospectors say they discovered the gold and were unjustly chased away. Last month, after a judge divided the Juruena land, 3,000 prospectors moved back in. Three men have been killed on each side of the conflict.

With millions of dollars worth of gold at stake, confrontations across Brazil are likely to continue. At issue, industrial miners say, is the future use of the Amazon. "The only viable

occupation in the Amazon is mining," said Antonio Dias Leite, the head of the Association of Gold Mine Industries. "The soil is too poor for agriculture and it's a crime to destroy the forest for cattle projects. We have to mine the wealth but we need a policy, not anarchy, not this predatory prospecting."

"This is an unfair battle," said Irene Briccatti, the lawyer for the Juruena gold diggers. "The gold diggers get into the jungles and struggle and find the gold. Then the companies hear about it. They have power and money and they pay bribes to get licenses."

The mining companies hope that law and order will be re-established this year when Brazil's new constitution is completed. But in several states, political leaders have made it clear they do not want to risk violence and sully their hands by confronting the gold diggers.

Alta Floresta, for one, is on the side of the gold diggers. Town officials have lobbied for them in the Juruena conflict. When there is no money to send Mrs. Briccatti, the gold diggers' lawyer, to Brasilia, the far-off capital, local people hold street collections to raise the travel funds. Mrs. Briccatti said she has been to Brasilia 21 times.

## ARCHITECTURE VIEW/Paul Goldberger

# Glass Houses for Trees That Grow In Brooklyn

**T**HE CLASSIC CONSERVATORY IS a building of glass that sits, jewel-like, in the midst of a lush, green landscape. So it is at Kew Gardens in London, where the voluptuous Palm House is surrounded by elegant gardens; closer to home, the graceful, rounded form of the Enid A. Haupt Conservatory at the New York Botanical Garden in the Bronx commands a wide expanse of open land.

The brand-new conservatories at the Brooklyn Botanic Garden, just now nearing completion, have no such luxury: they are set almost to the edge of Washington Avenue, and while on one side they overlook the splendid 50-acre landscape of the gardens, on the other side the conservatories face a row of old Brooklyn apartment houses. It is an odd juxtaposition, the lyrical forms of glass architecture and the brown brick of a conventional Brooklyn streetscape, but it makes for a striking architectural challenge, for these buildings are called upon to do something no other conservatory is required to do: make a transition between the harshness of the city street and the grace of a natural landscape.

The architects, the firm of Davis, Brody & Associates, have met this challenge admirably. The \$25 million Steinhardt Conservatory, as this new structure has been called in recognition of a \$3 million gift from the financier Michael Steinhardt and his wife, Judith, is among the only greenhouse structures anywhere that can be described as fulfilling a three-part architectural mission. Like all successful conservatories it is both a superb display area for plants and a handsome architectural object in itself. But the Steinhardt is perhaps unique among conservatories in that it succeeds as a work of urban design as well.

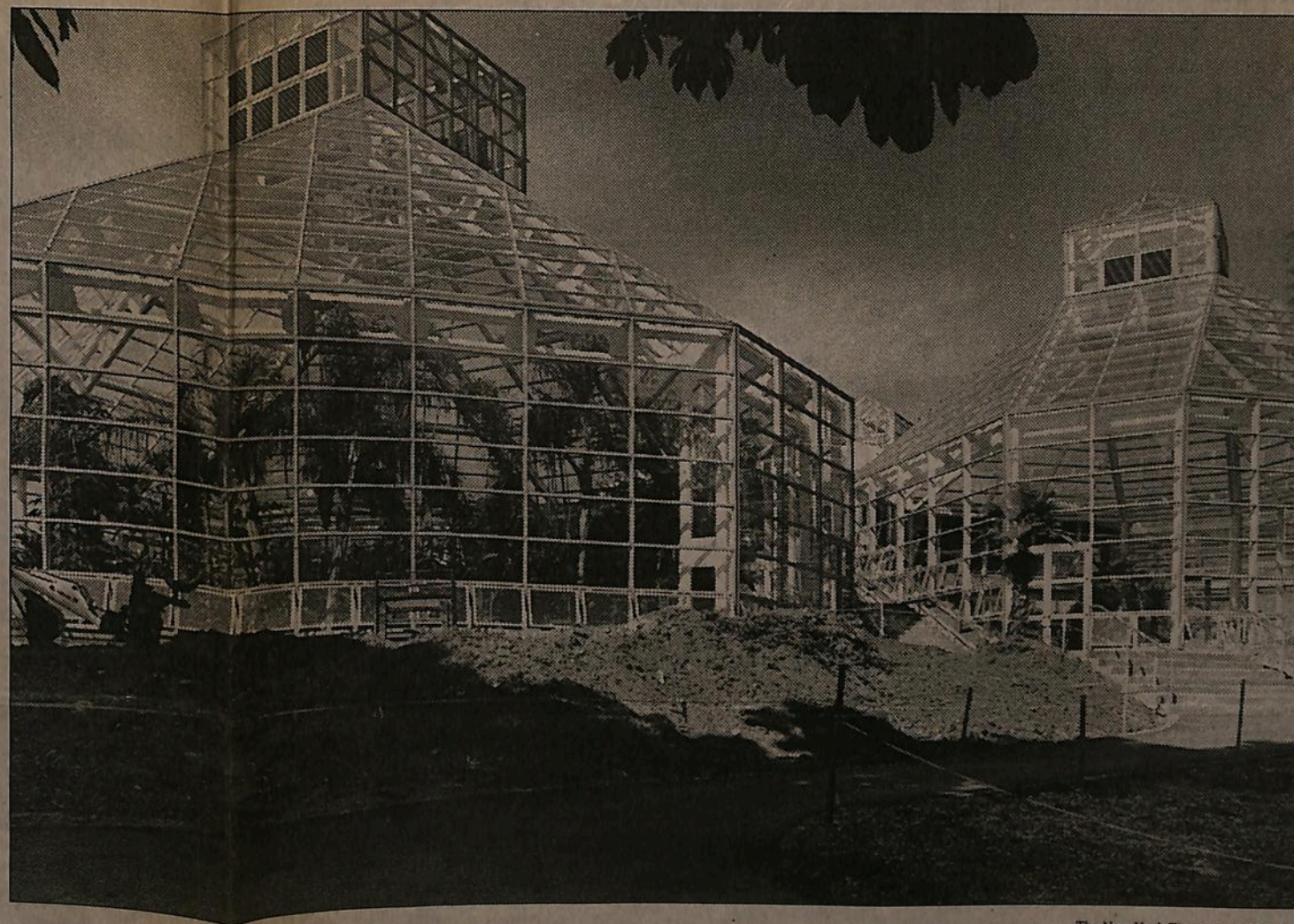
The buildings replace greenhouses dating from 1917 that the botanic garden's official history describes as "obsolete and crumbling"; the best portion of the original greenhouses, the oval-shaped Palm House, is being restored as a special-events center and will remain beside the new complex. The unorthodox location of the conservatories — at the edge rather than the center of the bo-

## The conservatories at the Brooklyn Botanic Garden resolve the harshness of the city street and the grace of a landscape.

tanic garden — is thus a fact of history rather than a new decision, but it makes perfect sense. For the garden's land is relatively limited, but by keeping its central portions open the landscape can appear that much more vast; there is a certain logic to keeping architectural intrusions, even if they are as benign as these, to the perimeter, where they can make a transition between the world outside and the world within the garden's gates.

The Steinhardt Conservatory is technically one structure, but it consists of four separate sections — a long wing set on Washington Avenue, with a stucco base and long gables of glass, and three separate pavilions, all of which are octagonal in shape with sloping roofs culminating in houselike central cupolas. The stucco base of the long wing is visible only from the street; from within the garden, the conservatory appears only to be a collection of buildings of glass, arranged around a central terrace.

Visitors enter the terrace first, and from there go into the long building, which contains an exquisite bonsai museum at one end, an aquatic greenhouse at the other, and an exhibit called the "trail of evolution," tracing the origin of plant life, in the center. A central staircase leads to a gallery and lobby below the outdoor terrace, which gives access to the three free-standing pavilions, each of which is designed to display the plants of a different climate; there is a desert pavilion, a



The New York Times/Jack Manning

Two of the pavilions of the Steinhardt Conservatory—greenhouses that succeed as works of urban design

tropical pavilion and a temperate pavilion, complete with rock caves growing mushrooms and ferns.

All three pavilions are entered from the lower level, bringing us into these high glass houses with considerable drama. There is a fair amount of movement upwards and downwards all through this complex (all accessible to the handicapped), but these architectural experiences never seem to get in the way of the exhibitions themselves. The architecture of this conservatory is a strong presence, but the design defers completely to the needs of the plants it houses.

The three pavilions, which are identical except in size — the 65-foot high central pavilion, housing the tropical display, is the largest — are exceptionally handsome as objects in themselves. Part of this is their shape, which seems at once crisp and serene. The form of these buildings gracefully blends the image of a traditional conservatory with something more energetic; the pavilions are not unlike great glass tents, and despite their high-tech materials they have the relaxed, comfortable air of tent structures.

But these are not pristine glass structures in the manner of I. M. Pei's pyramid at the Louvre — the Steinhardt pavilions are more vigorous, and less delicate and precise; their structure is heavier, more reminiscent of industrial architecture. Two other details distinguish the design — the pattern of the glass panels, which unlike many conservatories is strongly horizontal, and the soft green color with which the exterior metal sections have been painted. (The inside is white.) The color is in part a response to the McKim, Mead & White-designed administration building of the botanic garden, a stucco building that has long been painted green. While it is unusual to see a conservatory that is not white on the outside, the pale green works splendidly, tying the glass buildings neatly to the landscape. In fact, the conservatories look better in green than the administration building does; it would be better returned to its original color of ochre.

The Steinhardt Conservatory does not represent as complete a rethinking of the con-

servatory as a work of architecture as the Lucile Halsell Conservatory of the San Antonio Botanical Center, an extraordinary design by Emilio Ambasz finished last year. That project, in which a series of conical and angular structures of glass poke up out of the earth like huge abstract sculptures, will probably rank as this generation's most striking piece of conservatory design. But the Ambasz solution, brilliant as it is, would not have been right in Brooklyn, where the architectural problems were entirely different. The conservatory in Brooklyn had to effect a transition between the lush, rolling landscape of the main portion of the botanic garden and the cityscape of Brooklyn. Beyond that, it had to relate comfortably to the older buildings of the botanic garden which remain beside it.

Given this, Davis, Brody's blend of assertiveness and restraint is exactly right. The new conservatory manages to be at home with the worlds on both sides of it — it enriches the street, and it serves as a sumptuous architectural punctuation within the exquisite, magical beauty of the botanic garden itself. □

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## A POINT OF VIEW

*around sunken logs and floating gardens of water hyacinth and azolla ferns. Kingfishers flitted up and down along the stream edge while flocks of parrots rushed overhead. With the outboards shut off, the rapidly darkening forest seemed to come alive with mysterious sounds. Cicadas and frogs joined a myriad unknown birds in a haunting evening chorus. This strange symphony revealed the richness of life in the seemingly impenetrable forest that surrounded us. This was the Amazon that most of us had envisioned, and I would like to have a lifetime just to get to know this jungle."*

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14, 1988

# Brazil Accuses Scholar Of Aiding Indian Protest

By MARLISE SIMONS

Special to The New York Times

RIO DE JANEIRO, Aug. 13 — The Brazilian federal police have brought charges against an American anthropologist who accompanied two Amazon Indian leaders on a visit to Washington earlier this year.

Brazilian authorities have apparently been angered because the Kaiapó Indians were received by officials of the World Bank, the State Department and Treasury Department as well as Congressional staff members. The Indians complained of official mistreatment and the destruction of their jungle environment.

A major focus of their complaints was a new hydroelectric dam complex planned along the Xingu River in central Brazil, which is scheduled to flood up to 20 million acres, including Kaiapó lands.

The decision to press charges against Darrell Posey, a 41-year-old anthropologist and biologist from Kentucky, seemed aimed at sending a warning about the limits of official tolerance of protests abroad. Representatives of Brazil's estimated 220,000 Indians have become increasingly vocal at home, but few have traveled abroad.

Dr. Posey, who translated for the two Kaiapó, has been charged with violating a law that forbids foreigners to interfere in Brazilian internal affairs. A spokesman of the federal police in Brasilia said that if found guilty, Dr. Posey "will be expelled from the country."

## Denying the Indians a Voice

"The police want me to admit that I unlawfully took the Indians to Washington," Dr. Posey said. "The real issue here is the right of the Indians to speak for themselves about whatever, and wherever, they want."

José Carlos Castro, Dr. Posey's lawyer, has argued that his client cannot be punished for any criticism he or others made in the United States unless he violated American law.

Dr. Posey has studied the Kaiapó, a group of ancient warrior tribes, for the last 11 years and is coordinator of the department of ethnobiology at the Emilio Goeldi Museum in the Amazonian city of Belém.

He and the Kaiapó traveled to Miami in late January to attend a conference on tropical rain forests at Florida International University, which paid all expenses. The federal police here provided the Kaiapó with passports, and the regional director of the National Indian Foundation authorized their travel to Miami.

Members of the National Wildlife Federation and the Environmental Defense Fund, two American conserva-

tion groups, said they provided further funds at the Miami conference and set up a schedule for the Indians to visit officials in Washington.

At the heart of the Brazilian Government's action appears to be official concern over a proposed \$500 million loan by the World Bank to Brazil's state-owned power company, Eletrobras. Although the loan is not earmarked for a specific project, this company will build the Xingu dams.

As part of the evidence in the case, Mr. Castro said, the police are using Brazilian newspaper reports about the Kaiapó visit to Washington last February. The reports speculated that the Indians' testimony could adversely affect approval of the \$500 million loan. Negotiations began almost two years ago, but the loan approval has been postponed several times and it was recently rescheduled for a vote in October. Some Brazilian officials are said to believe that the delay is related to the Kaiapó complaints.

A spokesman for the World Bank denied any such link. "Sure there is a lot of concern at the bank about the Xingu project," the spokesman said. "We cannot lend money to the Brazil power sector and close our eyes to the guidelines for the environment and the Amerindians."

But he said the loan had been held up because the bank was looking into what he described as the power company's huge debt, its poor management and wasteful use of resources.

## Sensitivity to Foreign Criticism

The case against Dr. Posey has nonetheless highlighted growing official sensitivity about foreign pressure as the country is developing the immense resources of the Amazon. Officials frequently react with irritation when foreign governments, environmental groups and international loan agencies express concern about Indian rights and safeguarding a region that holds the world's largest tropical forest and river network.

The reception given to the Indians in Washington attracted attention at the highest levels of the Government. The national security council and the national intelligence agency have examined details and motives behind the Washington visit, while the order to press charges against Dr. Posey has reportedly come from high officials of the Ministry of Justice in Brasilia.

No charges have been brought against Kube-i and Paiakan, the two Kaiapó. In Brazil, Indians are wards of the state and are treated as minors before the law.

# Brazil Tells Americans Their Rain-Forest Fears

By MARLISE SIMONS

Special to The New York Times

RIO BRANCO, Brazil, Jan. 19 — In a stifling hall in the heart of the Amazon, a group of American legislators sat listening to the people of the rain forest — Indians and rubber tappers, who appealed for help from abroad to save their jungle habitat.

Three days later, in air-conditioned offices in Brasília, the capital, the same legislators were told by President José Sarney and other civilian and military officials that Brazil would not permit its sovereignty to be threatened by a foreign role in protecting the Amazon.

At yet another stop on their fact-finding mission to Brazil, which ended Thursday, the three Senators and two Congressmen heard businessmen in São Paulo argue that the country's growing population and urgent need to develop demanded opening up the vast tropical hinterlands.

These contrasting responses within Brazil offered a glimpse of the complex political, economic and social factors involved in drawing up any long-term strategy to slow down the destruction of the largest rain forest on earth.

"The internal dynamics of Brazil are inevitably more complicated than the headlines would suggest," said Senator Timothy E. Wirth of Colorado, head of the delegation, as it arrived in this distant corner of the Amazon.

## Anger at Interference

While growing international concern about the felling and burning of vast forest areas has raised the hopes of environmentalists and forest dwellers, it has added to the nervousness of Brazilian politicians and military leaders about foreign interference.

Already sensing a campaign against Brazil after protests over huge forest fires this summer set by cattle ranchers and land speculators, Brazilian officials have been further taken aback by the international publicity that followed the assassination last month of Francisco Mendes Filho. Mr. Mendes, a leader of Amazonian rubber tappers, was murdered near this city on Dec. 22, and his campaign to save the forest from the hands of ranchers and speculators had made him known abroad.

"If people turn the problems of the Amazon into a campaign against Brazil, it can lead to xenophobic nationalism," Rubem Bayma Denis, the head of the President's military staff, said after the legislators left Brasília.

The purpose of the American Congressional mission was to study ways of generating resources for environmental protection in this region where countries are squeezed by economic re-

cession and huge foreign debts. One idea already tested in Bolivia and Costa Rica involves an intricate financing method, whereby an outside entity would reimburse the Government for a portion of the nation's foreign debt and the money would then be used for local environmental projects.

When the subject of "debt for nature" swaps was raised in Brasília, according to delegation members, Foreign Minister Roberto de Abreu Sodré enthusiastically endorsed the delegation's suggestion to create a Brazilian foundation for such a purpose.

However, when the delegation later visited the presidential palace, President Sarney said he opposed links between Brazil's \$115 billion foreign debt and the environment. Mr. Sarney said this might be counterproductive and create xenophobia in Brazil.

"We don't want the Amazon to become a green Persian Gulf," he said in apparent reference to foreign involvement in the gulf region.

Mr. Sarney echoed the view of high-ranking Brazilian military officers that other countries are not only trying to hold back the country's development but that foreigners also covet the enormous mineral, biological and agricultural resources of the Amazon.

Brazilian officials have also argued that the industrialized nations have no right to criticize Brazil because they have destroyed so much of their own environment and are responsible for most of the world's pollution.

## Appeals From All Sides

In Rio Branco, the state capital of Acre, the American delegation heard very different opinions about the need for foreign assistance in Amazon protection programs. The state Governor, Flaviano de Melo, said that without urgent financial help from the Brazilian Government or from abroad, the state could create no new reserves and that areas already set aside as reserves would soon be invaded.

Even more dramatic were the appeals from members of the rubber tappers' union, long led by Mr. Mendes, the slain environmentalist. The union has often staged sit-ins to prevent bulldozers from moving into the forest.

A major threat to their land, the rubber tappers explained, was a new road that will penetrate Acre, a state that has been almost inaccessible and where much of the forest cover is intact. "We are not against the paving of the road," said Julio Barbosa, Mr. Mendes's successor. "But if the lands of the rubber tappers and the Indians are not legalized, we can say goodbye to this part of the Amazon."

# Brazilians Tell Of the Forest And the Fears

By MARLISE SIMONS

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## A Killing That Changed Much

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From Dan 31-7-89

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#### Own Profligacy Cited

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The Inter-American Development Bank approved a \$55 million loan to help pave the stretch between Porto Velho in Rondonia and Rio Branco, but the disbursement of funds was suspended in 1987 after Brazil failed to provide plans to protect Indian lands.

"I admire your movement and I hope you continue," said one of the delegation members, Senator Albert Gore of Tennessee, to the rubber tappers. Mr. Gore added that he would make sure no United States funds were spent on a road before the rights of the forest people were protected.

#### Amnesty International Appeal

LONDON, Sunday, Jan. 22 (AP) — Amnesty International released a report today urging the Brazilian Government to investigate "the widespread killing of community leaders." The request came a month after the murder of Francisco Mendes Filho, an environmental campaigner for Amazon rain forests.

Their pay and approval of equipment. They pay teachers' wages as crisis periods. They pay for the purchase of equipment.

# New hope for the rain

*Saving the Amazon won't be easy, but Mendes' death could*

By Philip Bennett

**M**EXICO CITY — Chico Mendes could see death coming. It entered conversations with the ease that was part of his manner when he spoke about the threats, about the hundreds of others killed in Brazil's Amazon, about the shadow of extinction descending in a curtain of smoke on the rain forest where he lived.

But Mendes could not have foreseen what has followed. Since his murder a month ago, the quiet leader of a rural union has become a national folk hero. Protest vigils have been held in his memory. A leading newspaper in Brazil named him "man of the year." His call to save nature from its enemies, scarcely heard prior to his death, has acquired an aura of prophecy.

"There are events that can change the direction of a country. The death of Chico Mendes is one of them," Fabio

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Digitized by the Hunt Institute for Botanical Documentation  
Mourners at the funeral of Chico Mendes in the town of Xapuri in western Brazil. SIPA/PRESS photo

# Amazon

Continued from Page A25

the dramatic loss of the country's tropical rain forests, the largest on Earth. Scientists have warned that, unless action is taken, the continued clearing of virgin forest in the Amazon will result in an ecological cataclysm that will be felt worldwide.

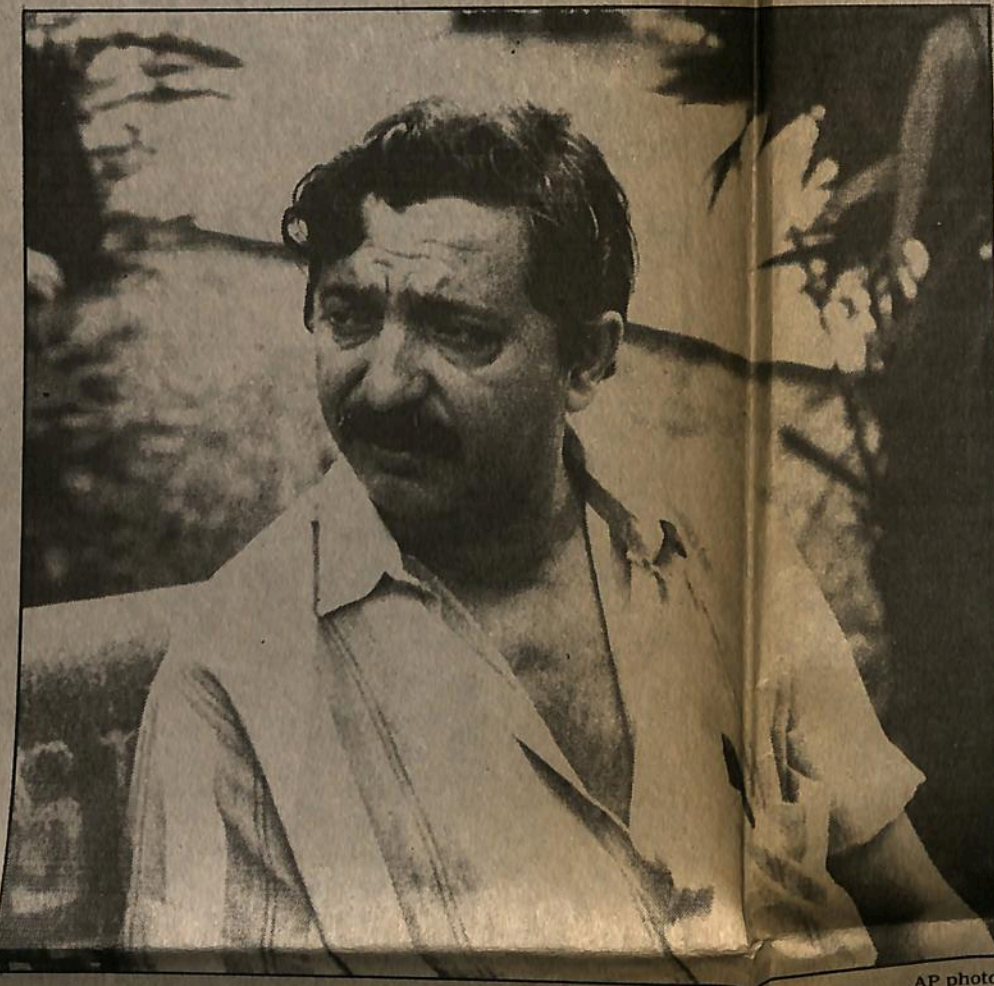
During the last month, the response of Brazil's weak civilian leadership has provided little encouragement. Under a storm of public outrage, authorities appeared to pursue Mendes' killers aggressively, arresting a powerful rancher who had threatened the labor leader. But last week, as part of budget-cutting measures to reduce a crushing fiscal deficit, the government abolished the federal forestry agency responsible for protecting the rain forests.

The government also allowed a 90-day period to lapse without producing the results of a promised review of Amazon development policy. The policy review, announced with fanfare last October by President Jose Sarney, was aimed largely at quieting foreign critics, including international banks, following a summer in which an area of the Amazon the size of Acre was incinerated by pioneers, cattle ranchers and industry.

In the absence of government initiative, the future of the rain forest is likely to be decided along the lawless roads of the Brazilian frontier, where deforestation of millions of acres is fueled by violent land disputes among wealthy ranchers, impoverished settlers and endangered forest dwellers gathered in Indian tribes or under the leadership of people such as Chico Mendes.

Few who came in contact with Francisco Mendes Filho do not describe him as an extraordinary leader. Friends, enemies and family called him Chico. He was born in 1944 in the rain forest that lies low against Brazil's borders with Bolivia and Peru. His parents worked tapping latex from rubber trees, work Chico himself did before leaving the forest to learn how to read and write.

During the 1970s, as Brazil rushed to conquer the Amazon region, an area about half the size of the continental United States, pioneers and ranchers



AP photo

**Chico Mendes: a rallying point for those who would save the rain forest.**

felled hundreds of thousands of rubber trees in Mendes' home state of Acre, driving thousands of rubber tappers into poverty or out of the country. Mendes began organizing rubber tappers, most of whom had no title to their land, to defend themselves and the forest against intruders.

Mendes and others eventually became leading advocates of "sustainable development" that would give preference to forestry-based economic activities such as rubber tapping, which does not kill rubber trees. The model is praised as a viable alternative to ranching or agriculture, neither of which are suited for long-term production in the poor soil left after the forest is razed by man-made fires.

### Conflict with cattle ranchers

Mendes was considered influential in

blocking elements of a road-building project funded by the Inter-American Development Bank. In 1987, he testified before the US Congress, and received an award for environmental protection from the United Nations. The plaque has a prominent place in the cramped Mendes cottage in the frontier town of Xapuri, where he was killed.

Despite support from state officials, Mendes' model of development brought him into direct conflict with Acre's cattle ranchers. His rubber-tappers union prevented some ranchers from clearing forest for pasture. He became a strong advocate of agrarian reform, denouncing a pattern of land ownership in Brazil that has left 1 percent of the population holding 43 percent of the land. "The destruction of the forest is for the

benefit of a half-dozen people," Mendes said in an interview with the Globe in Xapuri in late November. "But the forest represents the future of all of us. Our goal is not to preserve it like some untouchable sanctuary, but to develop rational uses. Cattle ranching and agriculture are irrational uses. They create a factory of misery."

Mendes said that threats against his life had intensified since he led a movement to create an "extractive reserve" for forest dwellers last year on land claimed by two Xapuri ranchers, brothers named Darly and Alvarinho Alves da Silva. Rubber tappers chased away workers sent to cut the forest, and Mendes filed suit charging irregularities in the brothers' land titles.

Last fall, Mendes brought to Acre outstanding arrest warrants that he had discovered in another state naming Darly Alves and a third brother in three murders. Mendes, who had survived six previous attempts on his life since becoming a public figure, was provided a 24-hour police guard.

Mendes was killed by a shotgun blast shortly after sundown Dec. 22 at the back door of his family's home, after he stood up from a domino game. His police bodyguards fled at the sound of gunfire. Darly Alves' 21-year-old son, Darcl, surrendered to authorities and confessed to the murder. His father was captured this month during a search by federal agents and also charged.

Although personal vengeance played a role in the shooting, human-rights activists, Catholic Church leaders and environmentalists blame Mendes' death on organized crime linked to powerful ranchers across the Amazon. According to Amnesty International, more than 1,000 people have been murdered in land disputes in Brazil since 1980, hundreds of them by gunmen allegedly connected to a right-wing landowners association called the Rural Democratic Union.

The organization, known by the initials UDR, opened a chapter in Acre last year. The group has denied involvement in the Mendes murder. One local UDR member, a rancher named Gilberto de Souza Menezes, said in an interview with the Globe in November, before the killing: "There's going to be a war here." He described Mendes as "a troublemaker, backed by foreign interests."

Feldmann said in a telephone interview last week that he will petition Brazil's Congress to open an investigation of land disputes and UDR activities when the legislature resumes session in February. He plans to launch a legislative battle over Amazon policy before the beginning of the burning season this summer and Brazil's presidential election in November.

### New death threats reported

Other environmentalists said that they would urge the Bush administration to give environmental issues a key position in any bilateral discussion of Brazil's staggering \$121 billion foreign debt, much of it held by US banks.

Meanwhile, recent death threats have been reported against Moacyr Grechi, a Roman Catholic bishop in Acre, and against the chief justice of the state court, Eva Evangelista de Araujo, who heard Mendes' complaint against the Alves brothers. "We do not believe that Mendes' murder was an isolated incident, but that he was singled out as part of a pattern that we are going to see more of," Feldmann said. "People must be prepared for more conflict."

Some environmentalists say that Mendes' legacy might be in uniting regional grass-roots movements with incipient national and international alarm about the fate of the rain forest. From Acre to the state of Para, in northeastern Brazil, regional environmentalist movements appear to be taking the lead in the search for creative answers to deforestation.

"The death of Chico Mendes is a terrible tragedy for everyone concerned with the quality of life on the planet, if not the possibility of life on the planet," said Stephen Schwartzman, of the Washington-based Environmental Defense Fund, who accompanied Mendes on a trip to the United States. "But it's also a great opportunity that shouldn't be lost. Chico brought together issues and constituencies and united them. He was somebody who had a solution."

In Acre last week, Jorge Franco, a state agronomist who worked closely with Mendes, said in a telephone interview: "The movement is growing more strong. The climate is tense because many have been threatened, and more will die. But the vacuum left by Chico is being filled."

from Doc. 31-I-'89

# Industry and peril in Brazil

## Smelting is called ecological threat

Second of three articles.

By Philip Bennett  
Globe Staff

MARABA, Brazil - When the iron magnates of Maraba built furnaces near a slow bend in the Tocantins River, they spared a swath of surrounding rain forest as a symbol of the peaceful coexistence of industry and nature.

That forest has become a fence. Hidden behind the wall of vegetation and guard houses is a sight that environmentalists regard as one of the



most horrifying in all the Amazon: an eternal flame.

Opened here in March, pig-iron smelters have come to symbolize the deadly conflict between Brazilian industry and the world's largest rain forest, between development of one kind of wealth and conservation of another.

The production of pig iron requires iron ore, of which the Brazilian Amazon possesses the richest known deposits on the planet. It also requires charcoal, which comes from trees, which once blanketed the region.

For scientists, incinerating irreplaceable rain forest to make charcoal is an idea that bends the mind. They warn that pillage by the pig-iron industry is permanently damaging the environmental balance that the Amazon forests, the most extensive on Earth, share with the world.

"It dries the rivers, kills the animals, changes the climate, ruins crops, halts production, impoverishes the land," said Ismael Araujo, the director of environmental protection in the Health Ministry in the state of Para, where Maraba is located. "I'm telling you, this is apocalyptic."



Globe staff photo/Suzanne Kreiter  
Workers in Maraba, Brazil, rest on logs that are soon to be turned into charcoal. By 1992, seven pig-iron plants planned for Maraba, in the state of Para, would consume 700,000 tons of charcoal a year.

STON GLOBE MONDAY, DECEMBER 19, 1988

# Pig-iron smelting is called ecological threat

## AMAZON

Continued from Page 1

"The entire eastern Amazon is in danger of extermination by pig-iron and steel industries," said Paulo Nogueira-Neto, Brazil's secretary of the environment between 1974 and 1986.

Such forecasts and raging deforestation by cattle ranchers and peasant farmers set off worldwide alarm this year, especially in developed countries. Under pressure, Brazil's government is considering steps to slow the destruction, including the elimination of fiscal incentives for some industrial projects.



Yet at the heart of the problem are religiously held beliefs about development of the Amazon region buried deep in Brazil's history and identity. More than any specific government measure, say environmentalists and officials, what is needed to save the rain forests is a radical conversion.

Many Brazilian businessmen and officials insist that industrialization of the Amazon is an issue of national sovereignty, part of a destiny of economic greatness. They say that huge development projects are also necessary so that Brazil can pay its \$121 billion foreign debt, payment demanded by the same wealthy countries now applying environmental pressure.

"Europe and America destroyed their forests to become industrial powers, but when it comes to the Amazon they say, 'Stop!'" said Zoran Bosnic of the Corporation for Industrial Development, the government agency that developed the Maraba industrial park. "Brazil has a debt, people to feed and employ. The economy is under terrific pressure. It must industrialize as soon as possible."

However, the record of development projects in Brazil's tropical rain forest suggests that industrialization may prove not only disastrous for the environment. As presently conceived, critics charge, it may leave Brazil poorer rather than richer.

### Dreams of wealth

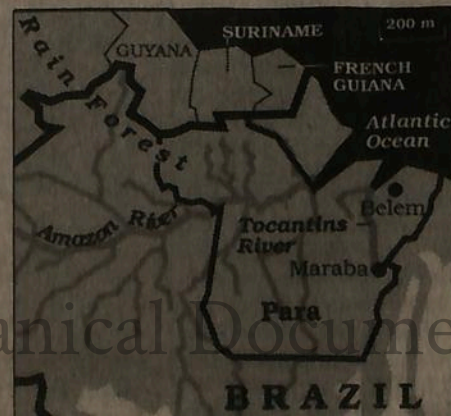
The Amazon region, nearly two-thirds of Brazil's territory, accounts for only about 3 percent of the gross national product. But there are few who doubt that the rain forest guards wealth beyond imagination.

### Dreams of wealth

Dreams of it are centuries old. Their size often has seemed determined by



Smoke engulfs huts in Maraba, Brazil, where charcoal is being made to fuel pig-iron smelters.



"We may have made some mistakes in the Amazon, but we must create industry everywhere for our people," he said. "I believe that Maraba can become a center of steel production."

### Tax breaks for smelters

It is unclear what economic benefit the smelters represent besides creating 2,000 jobs. Cosipar and other companies are guaranteed 10 years of tax-free operation and do not pay import duties.

Critics believe that companies such as Cosipar are interested principally in short-term profits. Otherwise, they say, the industry would have invested early

the size of the Amazon basin. The density for huge projects and heroic calamity. For Brazil, the impulse has been as much to conquer the region as to develop it. This has not encouraged small thinking. Neither have foreign banks.

Beginning in earnest in the 1970s, the government ran up its foreign debt by investing billions of borrowed dollars in Amazon projects. Armies of laborers raised huge hydroelectric dams — 125 are to be constructed by 2010 — and built roads, mining facilities and entire cities.

Meanwhile, former environmental secretary Nogueira-Neto, who was responsible during much of the period for evaluating the impact of the projects, worked out of a two-room office with three staff members.

The headlong rush has been marked by costly imprudence. Reservoirs have been flooded without evacuating animals or extracting valuable timber. A design flaw in the Balbina dam, finished last year with help from US taxpayers through a \$500 million World Bank loan, may require construction of a second dam to divert water to its reservoir.

During the last two decades, few dreams have been as grand as the one inspired in 1967, when a US Steel geologist stumbled on a deposit of iron ore in the remote Carajas Mountains, a few hundred miles west of Maraba.

The ore was remarkably pure. There were 18 billion tons of it.

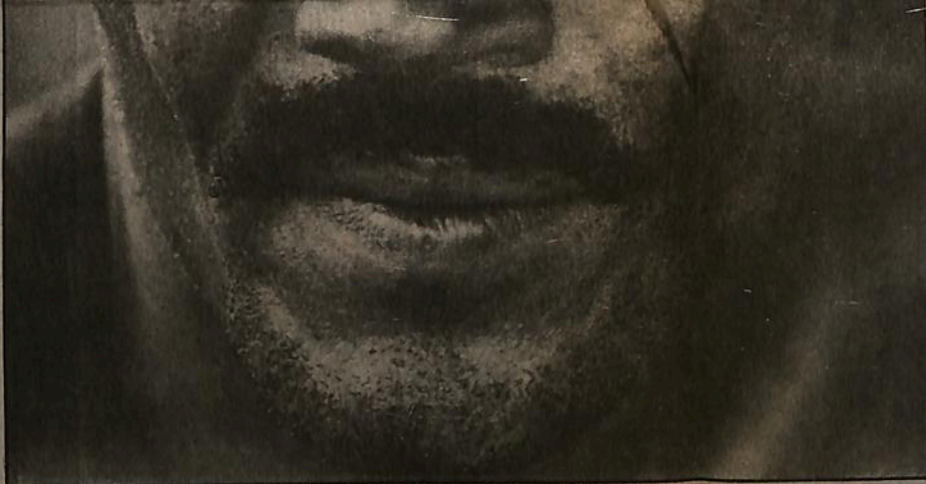
The bottomless pit at Carajas led in 1980 to the Greater Carajas Program, one of the largest development schemes ever contemplated. Spread over more than 300,000 square miles of north-eastern Brazil, an area larger than Texas, it already includes the \$4 billion Tucuruí hydroelectric dam on the Tocantins River and a 500-mile railway from the mines to the Atlantic coast.

Although it has been scaled down drastically from an original plan that would have cost \$62 billion, the Greater Carajas Program has caused a social upheaval. Colonists have flooded Para seeking jobs, land or fortune. They have killed Indians, each other and the forest in violent land disputes.

#### A Pittsburgh model

Eight times each day, trains a mile long roll through Maraba from the mines carrying 15,000 tons of iron ore. But in Maraba, where the population has tripled since 1980 to 160,000, there is unemployment and, in a city shaped by rivers, a serious scarcity of drinking water.

The pig-iron industry envisions Maraba as Pittsburgh. With the inauguration of pig-iron smelters, iron ore



**Charcoal worker Hevalcilliano Oliveira da Silva says he would rather be planting.**

from Carajas, instead of being sold abroad only as raw material, is being processed to be exported at a higher price. Twenty-four pig-iron plants have been approved for construction.

By 1992, the seven plants planned for Maraba would consume an estimated 700,000 tons of charcoal a year. By law, the industry eventually must obtain all of the charcoal from reforested land.

Almost nobody expects that to happen.

About 90 percent of the charcoal today is bought from small, private producers. The reason is simple: It costs one-third as much as charcoal obtained through managed reforestation. Without it, the industry would lose money.

So naked is the demand for cheap charcoal that the largest pig-iron company, Cosipar, acknowledges having paid for construction of 1,500 ovens used by small producers to burn wood from virgin forests.

The ovens are scattered across the landscape like earthen igloos. They bring fast money to hungry people, without licensing or any serious effort to study far more valuable forest products vanishing in smoke.

"We get the wood from that forest you see over there," said Hevalcilliano Oliveira da Silva, a colonist who began selling charcoal two months ago, after Cosipar built 18 ovens near a stand of rain forest outside Maraba.

#### Hard work, little money

Oliveira, who is 44 years old, migrated to Para 10 years ago with his family. The farm land that he purchased turned out to be as poor as he is. An 11-year-old daughter, Aldemide, died there from malaria.

"I would rather plant than destroy, but it's too difficult to find new land, too much money," he said, his black skin dusted with soot. "This is hard work, and you are in danger of getting burned, of breathing too much smoke."

Oliveira works alongside two teenage sons, his wife and two other colo-

nists, both in their twenties. They divide about \$200 a month. They sleep together in a shack at the forest's edge.

As the rain forest recedes slowly before them, scruffy grass appears on the cracked earth. A nearby clearing that once supported an explosion of life is now inhabited only by monstrous towers carrying electricity humming down from the Tucuruí dam and by the grotesque skeletons of Brazil-nut trees, left standing because they are protected by law.



Globe staff map by G. Sakalas

"In five years the area all around here will be completely destroyed for charcoal," predicted Gilson Rodriguez Souza, one of Oliveira's colonist partners. "As it will be desert, we'll have to find another way to live."

Conservative estimates hold that pig-iron production in Para could consume more than half a million acres of rain forest annually. The exact figure is unknown, in part because the plants have opened without completing environmental impact studies required by law.

"The environment is our main concern," said the president of Cosipar, Luis Carlos Monteiro, in a telephone interview from his office in Rio de Janeiro. "Our business depends on the forest. It would be foolish to destroy it.

its survival.

"The pig-iron plants will prove economically unviable," said Amilcar Alves Tupaissu, the Para minister of planning. "Deforestation will raise the costs of charcoal unreasonably. Of course, by that time they will have made terrific fortunes for themselves wiping out the region."

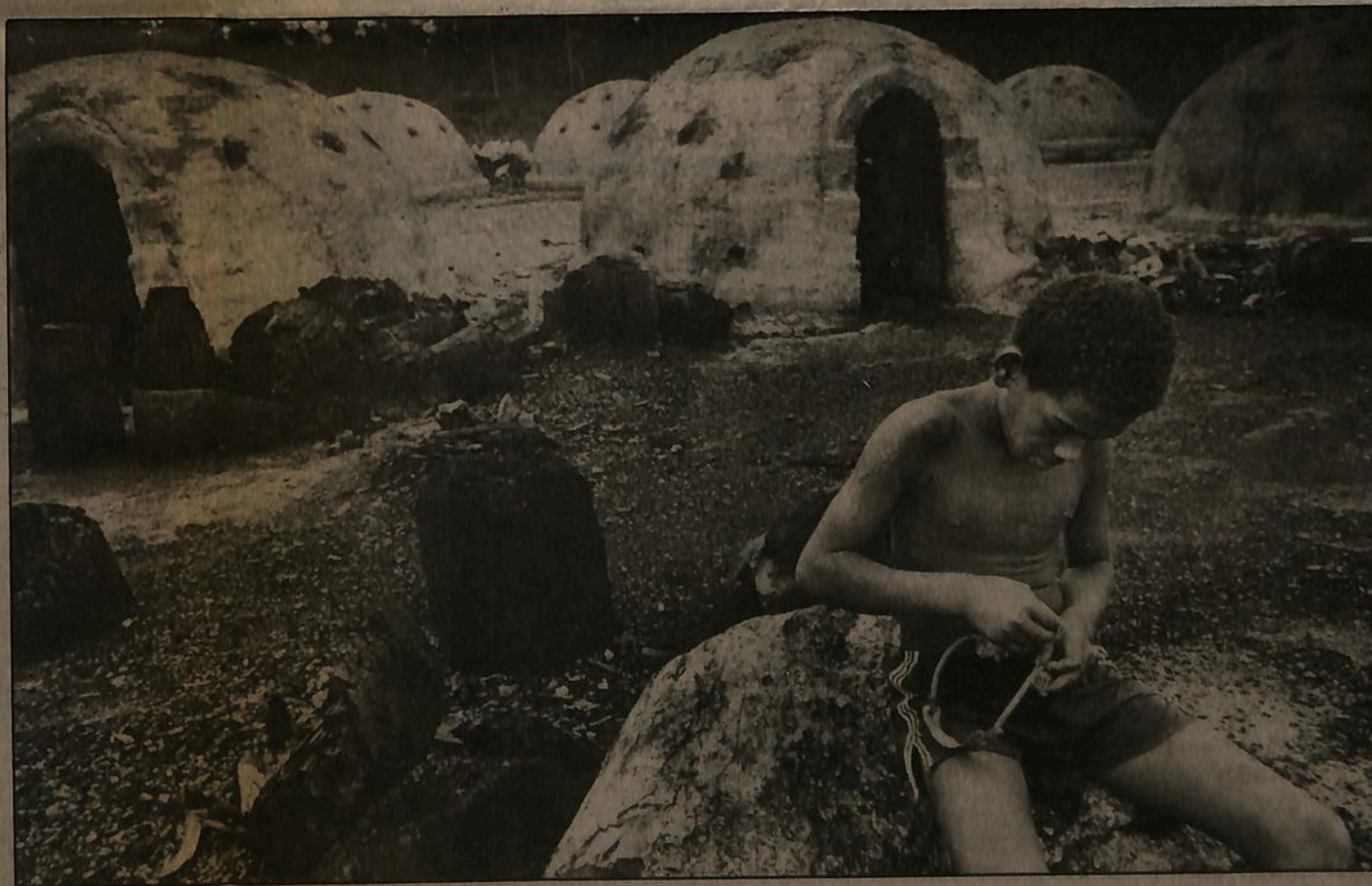
Alves is an energetic advocate of "sustainable development," a term that is repeated like a mantra by a rising generation of officials, economists and environmentalists in Brazil. They are seeking an alternative vision of the Amazon rain forests that might stir economic growth without destroying the source of the wealth.

"The big projects were designed to show the world that the Amazon belonged to Brazil, that the Amazon could be dominated from above," Alves said. "We are struggling to find a model for development that is less colonial and less damaging to the environment."

"The only problem is that nobody has the slightest idea what the model looks like."

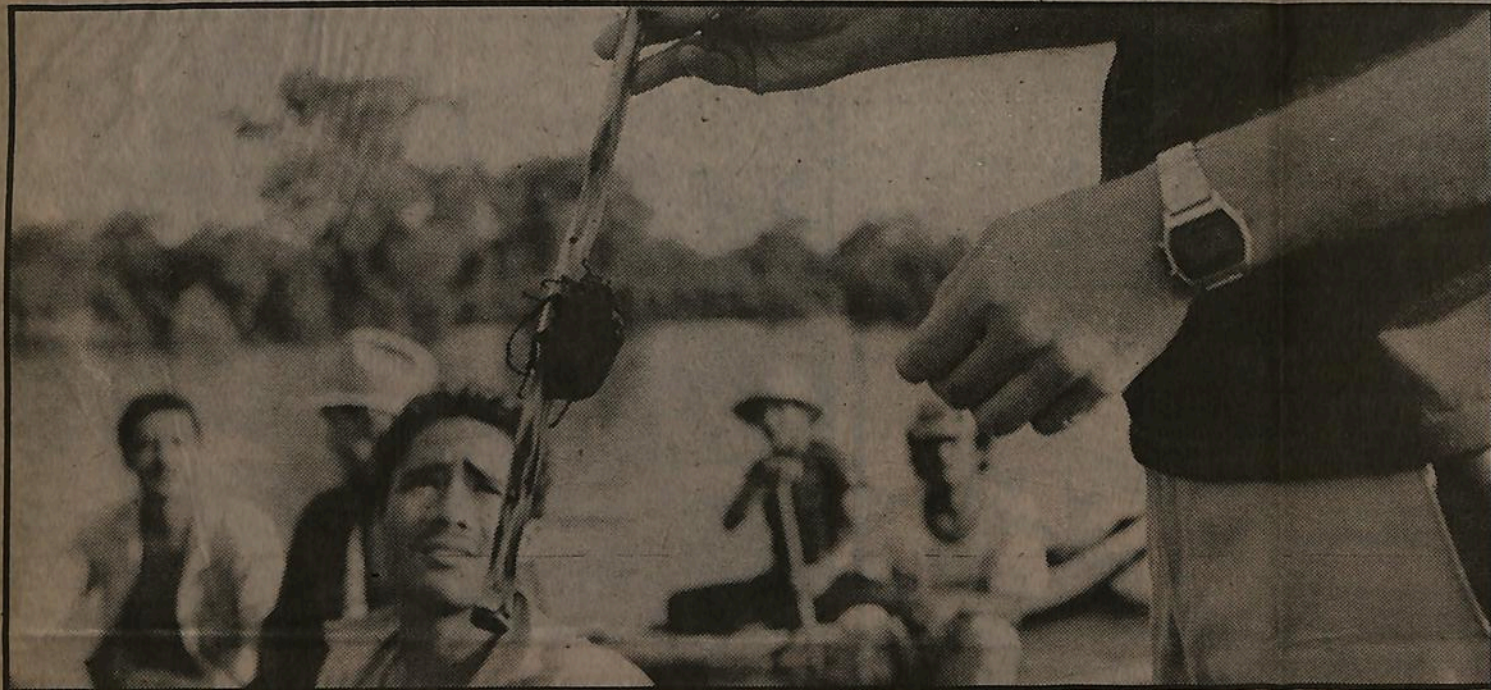
But, there are people who know what another model looks like. They are at the other end of the rain forest, thousands of miles away, living at risk.

**NEXT: Saving the Amazon.**



**Adeclaudio Oliveira da Silva, 12, plays with a slingshot in front of the charcoal huts in Maraba where his whole family works.**

Photographs by  
**SUZANNE KREITER**



A rhinoceros beetle is presented to a naturalist from the Explorer, top; a river village floats on rafts, above. Ghillean Prance, the ship's chief botanist, examines flora.

Photographs by James Feron

who were engaged in Amazonian research. Many of the passengers were themselves members of botanical groups, and some were quite expert in the flora and fauna of the region. Others had made this sort of trip before and were aficionados of exploratory travel. They came with sketch pad or video camera or just a pair of binoculars and perhaps a knowledge of birds and their calls.

The Amazon trips are scheduled for the fall, when the river is navigable. In most of the lowland area, the Amazon and its tributaries overflow their banks in autumn at the height of the flood season, and the enormity of this event is indicated by high-water marks perhaps 30 feet up the trunks of trees on the banks of tributaries.

One interesting feature of the Amazon basin, we learned, is the changing nature of the water. Near Manaus, the chief river port in Brazil, the muddy brown Amazon and the tea-colored waters of the Río Negro meet in what local people call "the wedding of the waters." The river divides into two colors for 10 to 15 miles downstream, brown on one side and black on the other.

Some of the river stops had been made before, and our visit was anticipated. At Pevas, still in Peru, we visited the Bora and Huitoto Indian tribes, who danced for us wearing bark cloth and yellow feathered headgear. A short but soggy walk through second growth forest took us to a plot where a small patch of coca plants was cultivated. An Indian explained, through Dr. Prance, how the coca leaves are mixed with ash of pourma and cecropia trees, and then ground and placed between the lips and gums to provide resistance to pain and exhaustion.

Another day, on a trip up a river at Leticia, a small, raffish town in Colombia, we were taken to a pond where giant Victoria water lilies grew. Up to eight feet across and able to hold the weight of a child, they are pollinated by scarabid beetles, which spend the day eating inside the lily's white flower. As they

leave, the beetles are doused with pollen — the flower is now red — and then find a new fragrant white flower to enjoy, and to pollinate the next evening.

This on-site lecture was fascinating, even after the skies opened up and soaked everyone to the skin. Life in and around the Zodiacs was occasionally hazardous, with wet landings — sliding off into water up to your ankles — and an occasional sting. I was bitten by a large ant (it felt like a bee sting) during the coca walk, prompting the Indian guide to slash a tree trunk and spread a white, gummy sap on my wound, causing a quick coolness and an immediate end to the pain.

**A**T Vendaval a poisonous viper was killed near the landing site of the Ticuna Indians. One of the anthropologists, David Campbell, dissected the creature and, at the next lecture, talked about the snake's feeding habits. This species, he said, was responsible for the majority of deaths by snakebite in tropical America. A new snakebite remedy is being practiced in Ecuador, he said. The area of the bite is touched with a wire attached to an outboard motor, lawn mower or motorized vehicle. Evidently, the shock breaks down the proteins of the venom. Fortunately, none of us had to sample the cure.

Indians in villages where the boat had stopped before — and where Dr. Prance had provided needed medicines and educational supplies — had artifacts to sell. There were masks and necklaces of bird and animal shapes carved out of nutshells, seeds and caiman or monkey teeth. The Indians accepted small American bills, as well as items of barter, like hats and T-shirts or knives. They were also pleased to take us into their huts or to explain, through the lecturers, how they processed manioc into flour and a farina bread that tasted like wood-flavored cardboard.

Another expert on the trip was Dr. Cal Dod-

acs and shining flashlights on sandy river banks. The brilliant red eyes of the crocodile-like reptiles reflected the light, which hypnotized the caimans and enabled a catcher in the bow to grab them by the neck. All creatures above three feet in length were avoided as potentially dangerous. The caimans were photographed and returned to the water.

We learned some Amazonian lore through Moacir (Mo) Fortes, a native of Coari, one of the Brazilian towns on the river. He had explanations for everything, some even believable. His version of how the howler monkey got its name — leaping for a branch and missing — was typical.

We saw jungle birds of extraordinary beauty, assisted by Dr. David Oren, an ornithologist who identified 157 varieties spotted on our trip.

We split up into groups of a half-dozen to explore markets in major trading centers and learned through seminars and by obser-

vation of the potential destruction of the rain forest by loggers, farmers and miners.

We went swimming in the Amazon, paddling between two moored Zodiacs, and did some water skiing behind an outboard motorboat. We had been assured that the infamous piranhas would not bother us at midriver, and found that to be true. In fact, piranhas caught by our fishing groups were served as part of the luncheon smorgasbord.

The cruise ended in Brazil at Belém, the Amazon's major Atlantic port, where we visited a forest preserve and a herbarium now staffed by Dr. Prance's Brazilian students. From there, the majority of passengers flew back to Manaus and then to Miami, with a few continuing to Rio de Janeiro. We met our son, Robert, a United States Foreign Service officer based in Brasilia, for a tour of the more urban Brazil: Recife, Salvador, Brasilia and Rio. To refugees from the jungle, it seemed like another world.

■

## Signing aboard to explore the Amazon basin

**Society Expeditions Cruises** will operate four Amazon trips this year, the first leaving Oct. 3 and the last leaving Nov. 2, all on the World Discoverer, which is a slightly larger ship than the Society Explorer, accommodating 140 passengers to the Explorer's 100, and with similar facilities and equipment. (The Explorer will cruise the west coast of South America instead of the Amazon this year.)

The trips include two 12-day voyages on the upper Amazon, between Iquitos in Peru and Manaus in Brazil, and two longer cruises, a 17-day trip from Barbados to Manaus, and a 19-day voyage from Manaus to Rio de Janeiro. (On all four programs two days are spent getting to the ship from Miami and then back after the voyage.)

Prices for the 12-day cruises range from

\$2,990 to \$7,690 per person, depending on accommodations, plus \$787 in round-trip air fare from Miami, while the prices for the longer cruises range from \$3,990 to \$8,790. Brazil requires a visa. Write Society Expeditions Cruises, 3131 Elliott Avenue, Suite 700, Seattle, Wash. 98121; 800-426-7794.

On a more modest scale, Amazonia Expeditions operates 10-day and 17-day trips on a relatively small (14-passenger) motorship under the supervision of Moacir (Mo) Fortes, an experienced Amazon guide, and Charles Grice, the boat's owner. Since they venture into different waters and ports than the Society trips and are on a craft with a shallower draft, the Amazonia sailings aren't limited to fall.

The trips leave Miami for Manaus the year

round every other Wednesday and return every other Sunday.

The price is \$150 a day per person, and the round-trip nonpeak group air fare from Miami to Manaus is \$498. Air fare is \$610 for peak periods, which include mid-December to mid-January, two 10-day periods before and after Brazilian carnival (which is 40 days before Easter) and possibly June 1 to Aug. 15 if the Brazilian Government decrees this a peak period, a decision it makes annually based on various factors. Shipboard rates remain the same.

The trips include visits to Amazonian lakes as well as exploration of both the Amazon and Rio Negro Rivers. Write Alyson Grice, Amazonia Expeditions, 2244 Swift Boulevard, Houston, Tex. 77030; 713-660-8115. J. F.

WHAT'S DOING ALONG THE

# It's Jungle 101 On a Voyage Up the Amazon

18 days of learning and exploring

By JAMES FERON

It was late afternoon on a tributary of the Amazon, muggy and still, and eight of us in a rubberized Zodiac inflatable boat were heading upstream in search of we knew not what. The whine of the outboard motor seemed an intrusion.

Twice a day on the 18-day cruise down the Amazon our ship, the Society Explorer, would drop anchor and we would pile into the half-dozen of the smaller Zodiacs to find orchids, identify birds, fish with drop lines or do some "general exploration."

About one mile up the tributary we spotted an island and a cluster of thatched shelters, characteristic of the settlements in the Amazon basin. "Anybody speak any Spanish?" our helmsman, a crew member, asked. Jay, my wife, said she'd try a high school version, so we pulled up to the grassy bank and asked if we could come ashore.

We had no way of knowing if the Indians had any idea who we were or what we were doing there. Our ship was one of the few exploring the upper Amazon, probably the only one utilizing the convenient Zodiacs to venture beyond established ports. The helmsman didn't know if an inflatable had come up this tributary before. As far as he knew, this island, Ilha do Panel, was a new stop and we were the first landing party.

The head man said that his village was called Bueno Vista and 66 people, all related, lived there and that they harvested corn, manioc, bananas and yucca. He answered all our questions but had none of his own. Was he not curious about where we'd come from? As it turned out, he already knew.

One of the children, we discovered, had scratched a simple likeness of our ship, complete with multiple decks, radar antenna and hoist for the Zodiacs, in the hard dirt of the village. The artist evidently had taken a dug-out canoe to the mouth of the tributary earlier in the day, discovering us before we found their site, and then spread the word with the aid of the deft drawing.

This communication seemed appropriate. JAMES FERON is the Westchester bureau chief of The Times.

for our trip along 2,300 miles of the world's second longest river, sailing on a voyage of discovery through a region unlike any other, moving several times each day from the comfort of shipboard air conditioning to the seemingly risky but always fascinating river banks.

It is a place of startling statistics. According to the Explorer's briefing materials, the Amazon and its tributaries, some of them longer than the Mississippi River, contain two-thirds of the world's river water; more water flows from the Amazon into the Atlantic each day than flows past London each year; Amazon water has been traced 50 to 100 miles out to sea.

The river itself is 4,000 miles long and oceangoing vessels can travel more than half that distance from the Atlantic west across the continent to Iquitos, Peru, where our trip began. At that point, we were closer to the Pacific Ocean than the Atlantic.

We arrived by air from Miami, via Lima, with nearly 100 passengers from 15 states and four countries. The trip on the Society Explorer was conducted by Society Expeditions Inc., a Seattle-based company that since our trip has changed owners and its name to Society Expeditions Cruises. This fall the company will cruise the Amazon on a similar but slightly larger sister ship called the World Discoverer, which shares Society's cruising duties with the Explorer.

COMMISSIONED in 1969 as the world's first expedition cruise ship, the Society Explorer is exceptionally maneuverable and can navigate confined waterways. Every cabin has two lower berths, an outside view, private toilet and shower, storage space and music system with two or three channels that occasionally includes short-wave English language news broadcasts.

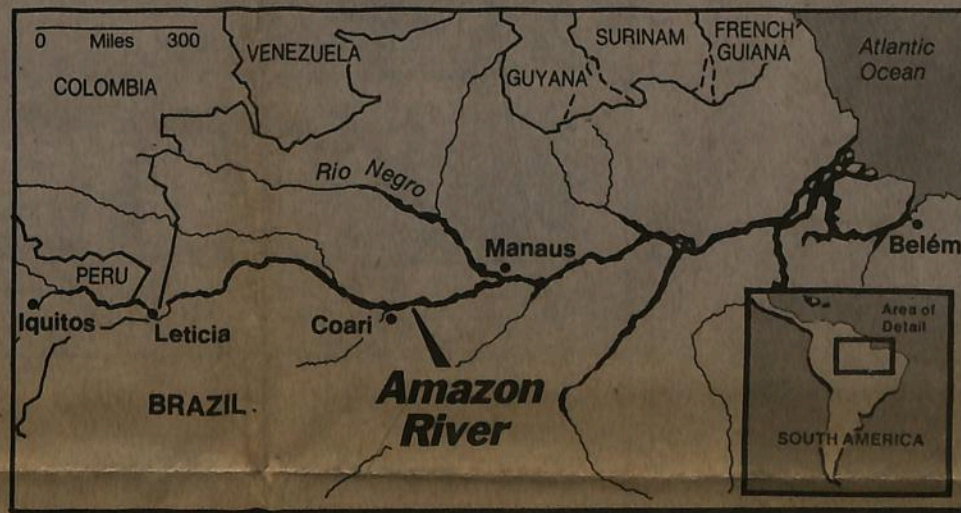
The top deck and a smaller deck at the stern contain typical chairs for sunning, and there is a fully equipped health club with exercise equipment, sauna and shower. A small outdoor pool was empty for our voyage.

Meals were sumptuous. Lunch was a buffet; dinner was served. Passengers tended to dress for dinner, which meant ties and jackets (but not formal attire) for the men and



James Feron

To avoid piranhas, passengers from the Society Explorer swim midstream in the Amazon.



The New York Times/July 31, 1988

fancier dresses or pants suits for the women. Wine lists appeared and a bottle or two would be purchased by a group. Seating was at random, providing an interesting mix of passengers, with some having gone on several such cruises.

The Amazon voyages are designed for travelers who enjoy participation as well as relaxation, and to that end there were expert lecturers on board — naturalists, botanists, ornithologists and anthropologists with experience in the Amazon — who led the jungle

CAMP, A PLACE TO DREAM:  
GIVE TO THE FRESH AIR FUND

walks and whose twice-daily presentations, often with slides, provided the necessary background for discoveries being made on the Zodiac forays. We were also supplied with a 205-page notebook on the history, geography and ecology of the Amazon.

For my wife and me, the trip became a learning vacation. A typical morning included two hours in a Zodiac looking for fauna, fishing, birding or just exploring, then a lecture with slides and some deck chair time. After lunch there was another lecture, a second trip in the Zodiacs, teatime and a shower. Before dinner we had an hour of recap, or "show and tell" as it was quickly

tagged, with passengers sipping drinks in the lounge and learning from the botanists and on-board experts what others had discovered during their hours in the smaller boats. Following dinner there was a movie or some time on deck under a starlit sky.

The passengers included neophytes as well as experienced travelers, some in their 70's and 80's who participated in most forays. There were muddy walks — we were warned to bring two pairs of fast-drying sneakers — as well as a few steep climbs and, once, a strenuous embarkation from a beach in storm-tossed waters that had turned to rolling surf.

Nevertheless, the trip was safe and comfortable, in part because we were prepared. Passengers were issued day packs to keep both hands free to ensure against losing their balance while transferring to the Zodiacs from steps that were lowered along the ship. Hats were a must, as was rain gear, and we came equipped with mosquito repellent and sun screen.

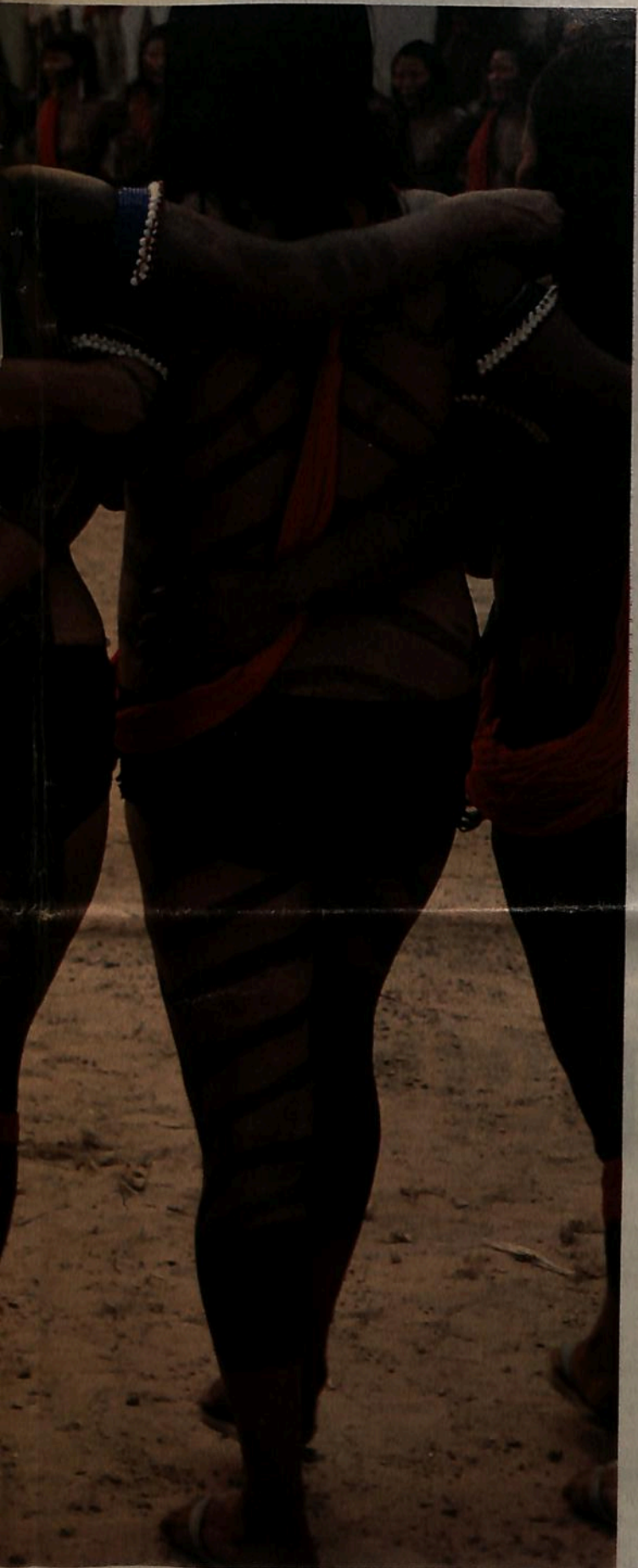
OUR trip was led by Dr. Ghilleen T. Prance, senior vice president for science at The New York Botanical Garden and soon to become director of the Royal Botanic Gardens, Kew in England. Dr. Prance, with his wife, Anne, an ethnologist, and their children had lived and worked in the Amazon jungle. They were accompanied by several naturalists and lecturers on the staffs of the New York and Missouri Botanical Garden



**Above: Kalapo women in a tribal dance in Gorotire, Brazil. Top of facing page: New, modern homes and a satellite dish-antenna, which brings Western television to Gorotire.**

# THE AMAZON

Digitized by the Hunt Institute for Botanical Documentation



PHOTOGRAPHS BY MAURI RAUTKARI/ WORLD WILDLIFE FUND



**Modernity—wealth, TV, new diseases  
—has come to the Kaiapo. Now they must decide  
the fate of their ancient culture.**

**By Marlise Simons**

**I**T IS GETTING DARK WHEN Chief Kanhonk sits down in the yard outside his home, ready for a long evening of conversation. Night birds are calling from the bush that sparkles with fireflies. Whooping frogs make a racket by the river. No one seems worried by the squadron of bats sweeping low overhead.

It is that important moment of the day when Indians of the Amazon, who use no written language, meet to talk, pass on information and tell stories. The night is when they recall ancestral customs, interpret dreams and comment on changes in nature and other events of the day. But from a nearby home come the sounds of a powerful rival: a television set is screeching cartoons at a group of children. I understand now why, that morning, by way of saying hello, these naked children of the rain forest had shouted things like "He-Man" and "Flintstones."

Three years ago, when money from the sale of gold nuggets and mahogany trees was pouring into Gorotire, Chief Kanhonk agreed to bring in television, or the "big ghost," as it is called here. A shiny satellite dish now stands on the earthen plaza like an alien sculpture, signaling that Gorotire — a small settlement of some 800 people on the Fresco River, a tributary of the Amazon — has become one of the wealthiest Indian villages in Brazil.

Yet Chief Kanhonk appears to regret his decision. "I have been saying that people must

buy useful things like knives or fishing hooks," he says darkly. "Television does not fill the stomach. It only shows our children and grandchildren white people's things."

The "big ghost" is just one of the changes that have been sweeping over Gorotire, but it seems to be worrying the elders the most. Some believe it is powerful enough to rob them of their culture. Bebtopup, the oldest medicine man in the village, explains his misgivings: "The night is the time the old people teach the young people. Television has stolen the night."

When I discuss this with Eduardo Viveiros, a Brazilian anthropologist who works with a more isolated Amazonian tribe, he seems less worried. "At least they quickly understood the consequences of watching television," he says. "Many people never discover. Now Gorotire can make a choice."

It was the issue of choice that first drew me to the Kaiapo Indians of the lower Amazon Basin. They seemed to be challenging the widely held notion that forest Indians are defenseless in face of the pressures of the competitive and predatory Western world around them. Unlike most of Brazil's 230,000 Indians, they go out into the white world to defend their interests, and it is no longer unusual to see Kaiapo men — in their stunning body paint and feathered headdresses — showing up in Congress in Brasilia, the nation's capital, or lobbying by doing a war dance outside a Government office. They have even bought Western gadgets to record and film their festivals.

Once the masters of immense stretches of forest and savannas, the Kaiapo were for hundreds of years among the most skillful farmers and hunters and fiercest warriors of central Brazil. They terrified other tribes with their raids. From the (Continued on Page 48)

*Marlise Simons is a correspondent in the Rio de Janeiro bureau of The New York Times.*

# S SAVVY INDIANS

Digitized by the Hunt Institute for Botanical Documentation



PHOTOGRAPHS BY RAPHAEL GAILLARDE/GAMMA-LIAISON

## Treed

WITH ITS UNCATALOGUED FLORA and fauna — literally millions of species and genera — the tropical rain forest canopy is the natural world's richest frontier, a world unto itself, really. And the latest best hope for scientists eager to explore it is, fittingly, a little on the otherworldly side.

Le Radeau des Cimes, it's called — Raft of the Tree Crowns. The brainchild of three Frenchmen — Francis Hallé, a tropical botanist; Gilles Ebersolt, an architect, and Dany Cleyet-Marrel, a hot-air balloonist — the canopy raft was conceived in 1984 and has been evolving ever since. Its current incarnation — a 600-square-me-

ter Twaron mesh supported by a frame of inflatable rubber pontoons — recently spent eight weeks slightly above French Guiana, where a dirigible deposited it in the treetops, and 50 scientists from 11 nations took turns working in it for several days at a time. (Above, a scientist is lowered from the dirigible to the raft; Cleyet-Marrel, the pilot, is in the mirror.)

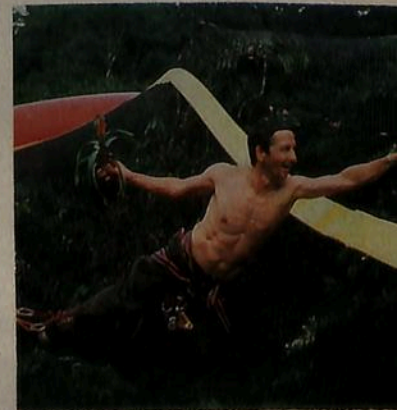
"Walking is a strange experience," said Hallé, in a phone interview from Montpellier, France, where he is a university professor. "Everything is elastic. I enjoy it very much."

According to Hallé, the multidisciplinary exploration was entirely suc-

cessful, though the scientific results may take months to verify. "We found a strange orchid, without leaves," he said. "It has just a root system and flowers, and it seems to me this is a new plant. But I am not sure it has not been discovered by someone else. This is just one example out of hundreds." The next journey may be to southeast Asia or central Africa, though plans are not yet certain.

Nights on the raft, Hallé said, "above you are only stars, and under you only those — I don't know the English word — those insects making lights. It was difficult to sleep, it was so exciting." —

BRUCE WEBER



A botanist, Guy Joulin, net-working

GREENPEACE and IN THESE TIMES January 1989: Daryl Posey, an ethnobotanist working with the Kayapo Indians in Brazil, spoke out against rainforest destruction in the Amazon at a lecture in Florida. When returning to Brazil, Posey and two Indian chiefs were arrested under the Brazilian Foreign Sedition Act. It is the first time that indigenous peoples are being tried as foreigners. Even worse, when they attempted to appear in court for the preliminary hearing, the Judge refused to allow the Kayapo Leaders in the court because they were not "acculturated"; they were in ceremonial dress. This is all a result of the Brazilian government wanting to silence opposition to the World Bank's \$500 million loan for the Altamira-Xingu dam. If you are interested in doing something, contact Amnesty International or Brent Berlin of University of California, Berkeley, Anthropology Department. Find out how your involvement can help.

Crop Genetics has created a new corn plant that grows its own corn borer toxins. Through genetic manipulation the toxin producing gene was isolated from Bacillus thuringensis and inserted in a Clavibacter xyli cynodontis bacterium which can survive within the corn plant. Crop Genetics is awaiting EPA approval for additional field trials.

WASHINGTON INSIGHT, December 15, 1988: Huperzia serrata=Lycopodium serratum has marked anticholinesterase activity. The plant has been in used in Chinese medicine and is being investigated for treatment of Alzheimer's disease.

NOTE: This publication is loaded with pertinent articles and lists of funding opportunities. It is published by Georgia Persinos, Ph.D., 11000 Waycroft Way, North Bethesda, MD 20852.

COLORADO DAILY and CHRISTIAN SCIENCE MONITOR December 1988: A review of Jack Weatherford's book, Indian Givers: How the Indians of the Americas Transformed the World was published. The book discusses many crops introduced by Indians but especially the potato.

*The 700 or so Suruí Indians of Brazil were first "officially" contacted in 1969. By 1974, half had died, mostly from influenza and measles. Although the Suruí territory was demarcated in 1976 to establish its boundaries, the Suruí's biggest problem has been the invasion of their lands by colonists. Colonists even illegally -- and with impunity -- constructed a road through the Suruí lands. (1)*

LETTER DICTATED BY SURUÍ CHIEF ITABIRA

I want to tell you about our suffering, the suffering of my people. In the past my people were healthy. We had no suffering; we had the forest. In the past, we had no contact with the white man, there was only us, Indians.

The first white men that contacted us were the rubber tappers. The road BR-364 highway did not exist then. The rubber tappers attacked the Indians. They gave us illness, they gave us flu, coughs and more sickness. The sickness we knew before was only malaria, and an Indian would just die when he got old. This was what our health was like. Our medicine man took care of us, he treated us.

Nowadays the medicine man can't cure us any more. The sickness came to take us away -- I don't know where to. This is our story.

We need help because FUNAI (the Brazilian governmental body responsible for Indian relations) does not take care of the Indians. This BR-364 cut through Rondônia and homesteading settlers spread through Rondônia. They cleared the forest and invaded the Indian land.

We used to be 700 Indians; now we are a little over 400. We need support. We need help. I want my people to become numerous again, and I want them to live well as we did in the past.

I feel like crying out to tell the situation of the Indians in Rondônia. Cinta Larga, Uru-Eu-Wau-Wau, Arara, Gavião, Zoró and Suruí -- all these tribes have been suffering a lot here in Rondônia.

We, the Suruí people, know very little of the white man. Our contact is very recent, and we are trying now to fight for our rights. I need a friend. I need help. We need help to be able to help our people.

Itabira Suruí  
Posto Indígena 7 de Setembro  
Casa Dos Indio, Riozinho, Cacoal  
Rondônia, Brazil

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# Cultural Survival Inc.

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Dear Friend,

In all the uproar about the destruction of tropical forests, one crucial fact is being missed:

In order to cut the forests you must first  
get rid of the people who live there.

And while many groups rightly decry the loss of thousands of species of animals and plants because of forest destruction, few have noticed that the forests are also home to millions of indigenous peoples.

And because these people stand up and fight to save their homes from utter destruction, they have been murdered, tortured, forcibly moved or intentionally subjected to deadly diseases to which they have no immunities. Indigenous cultures, whose very existence bears witness to the fact that they have mastered the difficult art of sustainable use of tropical forests, have been disappearing -- at the rate of one per year since the turn of the century in Brazil alone.

All in the name of development! These are just two examples:

-- A short time ago, cowboys turning jungle into ranches massacred 16 Cuiva Indians in Colombia, including women and children. They escaped punishment by arguing in court that killing Indians was not considered a crime in the area. They were just "animals, like deer or iguanas."

-- Gold was recently discovered on the lands of the 8,000 Yanomami Indians of Brazil. The Yanomami are the country's largest and most isolated indigenous group. More than 40,000 miners have illegally rushed onto Yanomami land. Hundreds of Yanomami have been killed by miners and many more have died of new diseases.

Unfortunately, these are not isolated examples of human rights abuses and murder. There is a consistent pattern throughout the world -- and throughout history -- of the absolute annihilation of indigenous peoples who stand in the way of "PROGRESS."

Around the world, these outrages are perpetrated by capitalists, Communists, industrial nations, Third World nations and multinational corporations. The outcome is usually the same: loss of land, destruction of special ways of life and identity, disease, forced relocation, exploitation ... even death.

We must stop this madness. The government policies and economic forces driving this terror can be changed. Indigenous peoples are not afraid of development. They want progress like everyone else. They become victims of progress only when they are excluded from it -- not because they are unable or unwilling to adapt.

over, please ...

All they need is some control over the speed and direction of change -- and some benefit from the rewards of development.

Cultural Survival is an organization of anthropologists and researchers from many other fields. Our goal is to help indigenous peoples like those who live in tropical forests around the world develop at their own pace and with their own valuable cultures intact.

If we could help these cultures survive, we could save the forests. And we would preserve thousands of years of practical knowledge about the potential of forest plants for medicine, food and other uses, and the practices which make use of -- but don't destroy -- the forest.

How can we save the people and the forests?

We have a plan ... but to implement it, I need your help. Let me give you a little background ...

The modern world will never leave huge resources like the Amazon basin and other tropical forests unused. Countries like Brazil face too many pressing economic problems for them to ignore such a resource and allow native Indians to live in peace as their ancestors did.

If we are to save the Indians' homes and protect the forests, we must prove to the societies that covet these resources that forests are more valuable and productive as forests than they are as cattle pasture or crop land.

That's why we are establishing markets for sustainably-harvested rainforest products that will increase the income of forest residents without destroying either the forests or the cultures. By identifying and developing markets for such products in the U.S. and Europe, we will obtain fair prices for producers and help them organize to take over processing and marketing which will increase the value of the living rain forest.

Here are a few examples of how the system is already working:

- An American ice cream company has asked us to identify tropical forest products they could use in current or future ice cream flavors. We have already agreed to supply them with 50,000 pounds each of Brazil nuts and cashews. Brazil nuts can be harvested off the forest floor without harm to forests -- in fact, if they are not harvested, they will simply rot there. The ice cream company will use the nuts in existing nut ice creams and in new flavors. We will deliver the nuts to the United States at a fair market price, and the rainforest residents who gather them will receive higher prices than they now get from intermediaries.

Forests used to harvest naturally occurring Brazil nuts could generate five times more income per acre than the same land used to raise beef cattle. And that doesn't include the enormous cost of clearing the land to create pasture. The World Bank estimates that it costs \$50,000 to clear forests and create a SINGLE job in the cattle industry in

continued ...

Brazil. The same land used for Brazil nuts could supply 500 Indians with employment during the harvesting months and generate one-fourth to one-third of their yearly income.

- The Huichol Indians in Mexico faced the loss of their forests to timber companies. With our help, they built a carpentry/woodworking school. Now they cut fewer trees, build furniture to sell locally, and make 300 times more money per tree than they received from the lumber companies who would have destroyed their forests.

- The Shavante Indians in Brazil are, with our help, beginning to market a dried palm fruit. A European natural cosmetics firm wants to use extracts from the dried palm fruit as a base for a new lotion. They are also very interested in the potential for thousands of cosmetic products made from tropical forest fruits, nuts, oils, fibers, essences and herbs.

These are just a few examples of how this program can save forests, help indigenous peoples take control of their own destinies, and create consumer awareness of the need to save tropical forests.

There are many other possibilities. For example, orchids can be cultivated in the rain forests (rather than ripped from the trees as they are now) and shipped to major cities. There are markets for natural "rain-forest" coffee, cacao (chocolate), vanilla and allspice. These products are mostly grown on plantations hacked out of forests ... but they could be integrated into living forests or become part of reforestation efforts.

Cultural Survival will certify that products are harvested in a way that does not harm the long-term survival of the forests. When we have done that, we will allow the companies marketing the final product to use a special trademark to alert you and millions of other consumers who care about saving forests -- and indigenous peoples.

We will also monitor the quality of these products and insure that the production does not adversely affect the native cultures that produce them.

It is a tragedy that urban residents of countries with rain forests know very little about the products of their own forests -- in fact, they look down on them. But by developing markets for these products in New York, London or Paris, we will create the demand for these products in their native countries where people often follow trends set in the U.S. and Europe.

The new consumer markets at home and abroad will create a greater base of advocacy for the forests and the people who live in them.

This system has the potential to give indigenous peoples in countries like Brazil the economic clout and legitimacy they need to hold onto their lands and prevent the destruction of forests.

Right now the Brazilians are in favor of our idea. They are upset about bad press they have received from burning the rain forests.

over, please ...

So our project is primed to go ... all we need is a boost from you to get it started.

Once we begin to raise awareness and show the profitability of sustainable use of forests, governments, corporations and people around the world will get involved. The idea will then take on a momentum of its own, and things will rapidly change on a large scale.

Even environmental groups are changing their thinking because of this revolutionary plan.

But I need YOUR help today.

So far it has only cost about \$5,000 to set up the system, identify the first products and arrange markets. But now we need to further explore markets and products and build a revolving fund to finance the import and export of these products from the thousands of groups who live in the forests.

That's why I hope you'll help.

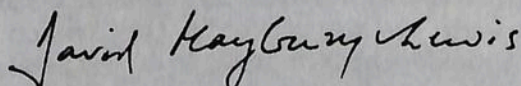
We are a small organization whose ideas can change the world. That means that your gift can change the world.

But time is short. There were once more than 4 million Indians in the Amazonian jungles ... there are now less than 200,000! And hundreds will die in the next 12 months. I have enclosed a letter from a chief of one of the groups in danger. He expresses far better than I ever could what his people are facing.

Will you read his letter carefully, and then send \$50 today to help us get this project off the ground, help save tropical forests and the indigenous peoples who live in them, and fight for the survival of unique cultures throughout the world?

Your gift means a lot to us and will be stretched as far as possible. I thank you for it in advance.

Sincerely,



David Maybury-Lewis  
President & Founder, Cultural Survival  
Prof. Anthropology, Harvard University

DM-L:sal

P.S. The time is right to move on this. The public's attention has been caught. But you and I know how fickle public opinion can be. If we can develop markets quickly, we can start a trend that will last. If we miss this opportunity, there may never be another. That's why I hope you will send a gift today. If \$50 is too much, will you send \$25 or \$35? We must get the ball rolling NOW!



# CARNIVAL IN RIO

# CONSERVATION INTERNATIONAL RAIN FOREST IMPERATIVE 1990-1999



## CONSERVATION PRIORITIES

■ Threatened Hotspots

□ Major Tropical Forest Wilderness



## CONSERVATION INTERNATIONAL

February, 1990

### MEMORANDUM

TO: All Conservation International Members

FROM: Russell A. Mittermeier, Ph. D. *RAM*

SUBJECT: The Rain Forest Imperative: CI's Ten Year Conservation Strategy

Never in all my years of conservation work have I known of a conservation campaign as significant as the one I am about to describe to you.

This campaign, our Rain Forest Imperative Campaign, was just unveiled to the international press on January 30th. It is a campaign like no other, setting an aggressive global agenda for Conservation International for the 1990's, the "make-or-break decade" for conserving rain forest worldwide.

Because you have been such a loyal and generous supporter of Conservation International, I want to tell you personally about this initiative.

I also want to tell you about a breathtaking act of generosity that can help to make our aggressive Rain Forest Imperative Campaign possible . . . a \$1 million challenge grant that will double the impact of your gift.

By supporting the Rain Forest Imperative Campaign, you will reach out to the most important places in the earth's biosphere. To the places where life bubbles up in astounding profusion and variety. To the places where we can save more of the world's life forms than anywhere else.

Ten "biodiversity hotspots" cover just one-500th of the earth's land surface. Yet within this small segment of the planet live one out of every seven plant species on the entire earth! Clearly these tropical forests are the places where conservation efforts must now focus.

But 90 percent of the forests now covering the hotspots will be destroyed during the 1990's unless we find a way to change the course of economic development.

At this historic moment, the worldwide conservation movement needs clear priorities and achievable goals. Here are the ten "biodiversity hotspots" that Conservation International has

chosen as our top priority for the crucial decade of the 1990's:

1. The island nation of Madagascar.
2. The Atlantic forest of eastern Brazil.
3. The lowland forest of western Ecuador.
4. The coastal forests of Colombia's Choco region.
5. The uplands of the western Amazon basin.
6. The Philippines.
7. The island of New Caledonia in the South Pacific.
8. The remaining rain forests of Peninsular Malaysia.
9. The remaining forests of Malaysia's Sabah and Sarawak provinces on the island of Borneo.
10. The eastern Himalayan foothills in Nepal and Bhutan.

These are incredible reservoirs of life. If we can save them, we will have saved a significant part of the planet's wild species.

In addition, our Rain Forest Imperative Campaign will also focus on five areas of the world where vast ecosystems have -- so far -- escaped extensive impact by modern man. Only in these five Major Wilderness Regions will tropical forest wilderness remain on such a scale that evolutionary processes can continue unimpeded by human changes on the planet.

South America contains three of the five Major Wilderness Regions:

1. The forests of southern Guyana, Suriname and French Guiana.
2. The vast mosaic of forests south of the Rio Orinoco in Venezuela, with adjacent areas in northern Brazil.
3. The western reaches of the Amazon basin, shared by Brazil, Colombia, Ecuador and Peru -- also one of the "biodiversity hotspots."

Plus these two areas:

4. In Africa, the Central Zaire Basin in Zaire and Gabon, an area settled mainly by forest-dwelling tribes.
5. In Southeast Asia, the island of New Guinea, shared by Papua New Guinea and the Irian Jaya province of Indonesia, a vast expanse of rain forest, much of which has been little disturbed.

To protect these five major wilderness regions and the ten "biodiversity hotspots" Conservation International and our conservation partners must redirect the economic forces that are driving the destruction of rain forests. We must lead the way in learning to provide human livelihoods from the intact rain forests, harvesting the perpetual bounty of the natural forest, rather than clearing the forest for cattle grazing or traditional agriculture -- poor choices in tropical conditions.

Conservation International is already deeply involved in activities that can resolve the conflict between development and conservation.

In the over-ninety percent of the Amazon region that lies outside protected reserves, we are, for example, demonstrating multiple use forest management techniques designed to maintain as much intact forest as possible. Through these techniques, sustainable harvest and sale of natural forest products can be used to protect the land rights of indigenous tribes, reduce the incentive for indiscriminate forest clearing for farms and ranches, and make these critical non-protected areas as hospitable as possible to a full range of indigenous forest.

There are hundreds of enterprises that can be sustained perpetually by the natural intact forest, in contrast to alternatives like cattle pasture or single-crop farming that completely destroy the forest.

Which conservation activities are practical in a particular country, a particular region, a particular village? Answering these questions is the key to redirecting the economies of the developing nations.

Conservation International brings to this work the best scientific tools available, and great sensitivity to the cultures and economies of the tropical countries. This sensitivity to the real-life situations of these countries led to our innovation of the debt-for-nature swap, now being replicated by other organizations around the world.

We also bring indispensable experience in building partnerships with the people of tropical nations. Already we have close relationships with the people of Brazil, Mexico, Costa Rica, Peru, Madagascar, Guatemala and Bolivia. We have cooperative work plans with more than 50 international conservation or development institutions.

And we have pioneered an "ecosystem conservation" approach to the design and management of conservation programs. This approach seeks to bring local needs into balance with threatened ecosystems. Our programs are helping local people learn to sustain their livelihoods indefinitely by using, not abusing, the fertility of the ecosystems they live in.

But we must do much more. The threat to our rain forests will only be defeated by a new, even more aggressive program of conservation initiatives.

The 1990's are the last decade in which the "hotspots" can be saved, in which the Major Wilderness Regions will remain inviolate. This is the last opportunity to set in motion sweeping national conservation programs before economic and demographic problems spiral out of control.

In order for us to launch our aggressive Rain Forest Imperative Campaign -- as well as maintain the success of our other programs -- we need to raise 7.8 million dollars by July 1990. Here's how you can help us reach our immediate goal of \$2 million . . .

One supporter of Conservation International has agreed to contribute \$1,000,000 to the Rain Forest Imperative Campaign on the condition that this amount is matched from individual donors.

Under the terms of the challenge, your gift today will not only help us meet the costs of the Rain Forest Imperative Campaign, but it will also release an equal amount of the \$1 million matching grant. Thus, the impact of your gift will be doubled!

To match this \$1 million grant, we will need thousands of small gifts of \$25, \$50 and \$100 from our members. We will also need a significant number of gifts at the level of \$500, \$1,000, \$5,000 and above.

Your gift, at whatever level you are able to participate, is urgently needed to help us match this \$1 million challenge grant. Please indicate your level of support on the enclosed gift card and return it as soon as possible.

With conservation action that is bold, strategic, and mindful of the forces now shaping societies, we can sustain our planet's natural resilience into the next century.

Conservation International is uniquely qualified to undertake this work. We bring to the challenge the talent of the world's top environmental scientists. We bring an uncommon sensitivity to the cultural and economic realities of the nations where we are working.

I hope we can count on you to make an especially generous gift right now, to launch Conservation International's Rain Forest Imperative Campaign. Together, you and Conservation International can have a dramatic impact on the course of conservation worldwide.

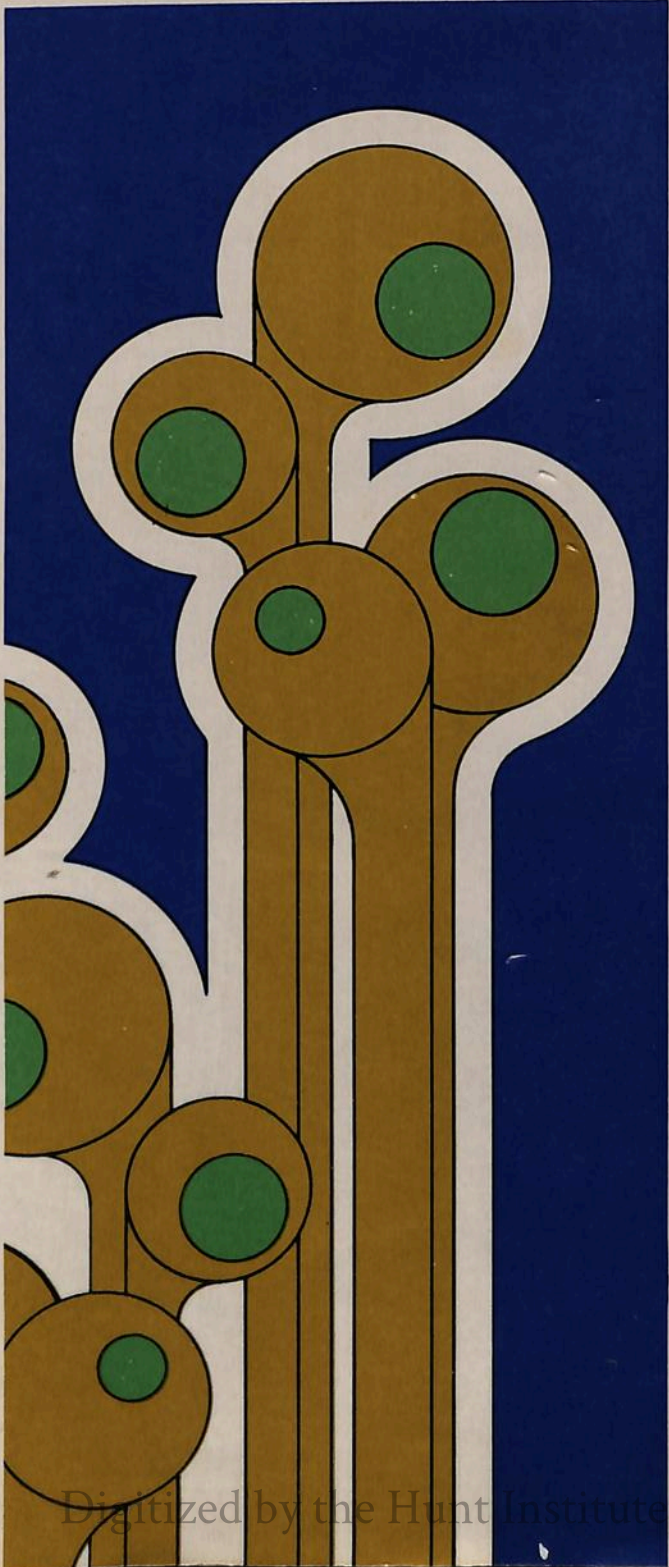
P.S. As we embark on our Rain Forest Imperative Campaign, it's important for me to know that we are well on our way to matching the \$1 million challenge grant that's been offered to us. So please return the enclosed gift card with your contribution today.

Remember that your gift will be doubled by the matching grant, and the larger your gift, the more of the \$1 million you will release to help support the worldwide Rain Forest Imperative Campaign. Please match our million-dollar donor's generosity with your own!



BERNARD LOWY  
BOTANY DEPT LSU  
BATON ROUGE, LA.  
70803

Ministry of the Interior  
Special Environmental Agency



**Program  
of  
Ecological  
Stations**

Brasília, 1977

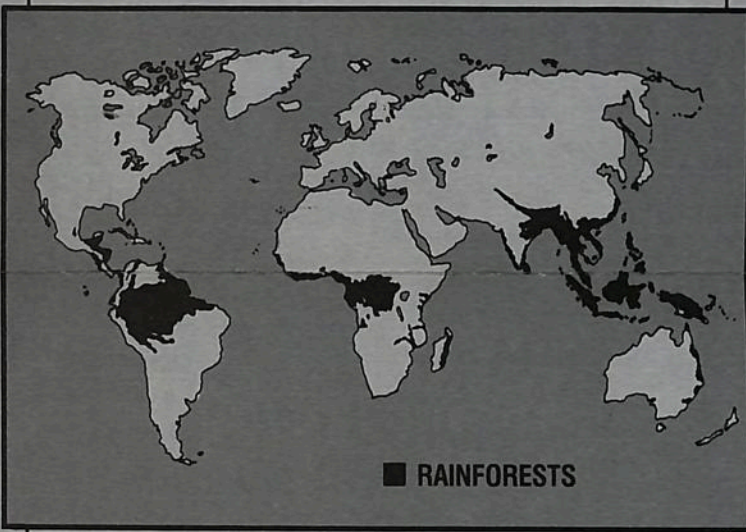
# RAINFOREST FACT SHEET

## GREENPEACE...in defense of our planet.

### RAINFORESTS... An Irreplaceable Treasure

The Greenpeace Rainforest Campaign is an international effort to preserve the world's remaining rainforests, for ourselves and future generations.

- Tropical rainforests are the richest and most diverse ecosystems on earth, home to at least 50 percent of all types of living things—as many as 5 million species of plants and animals. Panama, for example, sustains as many plant species as the entire European continent.



### The Greenpeace Rainforest Campaign will include activity on four continents.

- Today, Earth's tropical rainforests cover approximately 7 percent of the earth's surface. Each year, more than 60 million acres of tropical rainforest are degraded or destroyed—nearly 117 acres every minute!
- Rainforests play a critical role in maintaining world climatic stability, by generating a significant amount of the world's rainfall and serving as a carbon dioxide "sink" in the fight against global warming.

*Greenpeace needs your help to save the rainforests*  
SS



1436 U St., N.W. P.O. Box 3720  
Washington, D.C. 20007

### A few of the thousands of species facing extinction from continued rainforest destruction

- |                   |                 |
|-------------------|-----------------|
| jaguar            | myna bird       |
| chimpanzee        | hummingbird     |
| giant anteater    | coral snake     |
| river dolphins    | python          |
| tiger             | lemur           |
| ocelot            | pygmy marmoset  |
| gorilla           | boa constrictor |
| manatee           | caiman          |
| howler monkey     | peccary         |
| crocodile         | quetzal         |
| parrots           | orchids         |
| army ant          | mahogany tree   |
| monarch butterfly | Brazil nut      |
| toucan            | mango           |
| macaw             |                 |

- Destruction of rainforest results in extinction of at least one species of plant or animal every day.
- Ninety percent of the world's non-human primates are found only in tropical rainforests . . . along with two-thirds of all known plants, 40 percent of birds of prey and 80 percent of the world's insects.

### The Value of a Living Rainforest

The rainforests are home to more than 140 million people, many of them indigenous tribes who have lived in harmony with the forests for thousands of years, extracting renewable products in a process of natural conservation.

Rainforests are the source of hundreds of renewable oils, resins, gums, rubber latexes, nuts, fruits, vegetables and medicinal plants. Unfortunately, government planners often ignore the long-term economic value of these products when they allow the forests to be destroyed for non-sustainable uses that only generate short-term profits.

- Rainforests are the world's principle source of medicinal plants and natural sources of drugs: for example, 70 percent of the more than 3,000 plant species known to be valuable in the treatment of cancer, are found in tropical forests.
- Erosion and siltation of rivers and oceans from rainforest destruction ruins drinking water and irrigation supplies, destroys fish breeding areas and kills marine habitats.
- At the current rate of destruction, scientists estimate the world's rainforests could completely disappear in 30 to 50 years.

**2** Employees of City Gardens in Boston support Conservation International through an innovative company program.

**3** CI's tropical rain forest program for the 1990s focuses on 10 biodiversity hotspots and 5 major wilderness areas.

**4** Lessons from the tropics may help conserve temperate rain forests in North America.

**6** A unique gathering of scientists and policy-makers helps set conservation priorities for the Amazon Basin.

## The Rain Forest Imperative Charts CI Course for the 1990s

On January 30, Conservation International (CI) unveiled **The Rain Forest Imperative**, an ambitious strategy for conservation of the most threatened areas of the world's rain forests. The plan highlights ten "hotspots" of highly endangered tropical rain forest and five major tropical wilderness areas for urgent conservation action during the next ten years.

At a news luncheon held at the Smithsonian Institution in Washington, D.C., legislators from the United States and Brazil and actress Susan Sarandon joined CI staff to emphasize the importance of action to save tropical forests.

CI President Dr. Russell Mittermeier, who presented the plan, told an audience of more than 150, including 60 journalists, that the widening gap between temperate and tropical regions would shape world events in coming years. "In this new era, conservation of rain forests is not just an environmental priority but a cornerstone of geopolitical stability," he warned.

Rep. Claudine Schneider (R-R.I.) said that CI's plan could

▶ page 3



**ABOVE: DEFORESTATION OF THE PERUVIAN AMAZON, FROM THE RAIN FOREST IMPERATIVE**  
**AT LEFT: MUDMAN FROM THE INDEMA VILLAGE IN THE HIGHLANDS OF PAPUA NEW GUINEA, HOME TO SOME OF THE WORLD'S MAJOR TROPICAL WILDERNESS AREAS. MANY OF ITS INHABITANTS STILL LIVE TRADITIONAL LIFESTYLES.**



A QUARTERLY REPORT TO THE MEMBERS OF CONSERVATION INTERNATIONAL  
VOLUME IV NUMBER 2 • SPRING 1990

N.Y. Times 8-VI-1990

# Loss of Tropical Forests Is Found Much Worse Than Was Thought

## Study Sees Climate Peril and 'Tragedy' for World

By PHILIP SHABECOFF

Special to The New York Times

WASHINGTON, June 7 — Tropical forests, which play a vital role in regulating the global climate, are disappearing much more rapidly than previously estimated, an international research group said today.

Each year recently, 40 million to 50 million acres of tropical forest, an area the size of Washington State, has been vanishing as trees are cut for timber and to clear land for agriculture and other development, the World Resources Institute said in a report. The group said 1.9 billion acres of tropical forest remained.

The report, "World Resources 1990-91," prepared in collaboration with the United Nations, was described by its authors as the first comprehensive estimate in a decade of tropical-forest losses around the world.

The rate of loss, measured in most countries in 1987, was nearly 50 percent greater than the last global estimate, prepared by the United Nations Food

and Agricultural Organization in 1980, according to the institute.

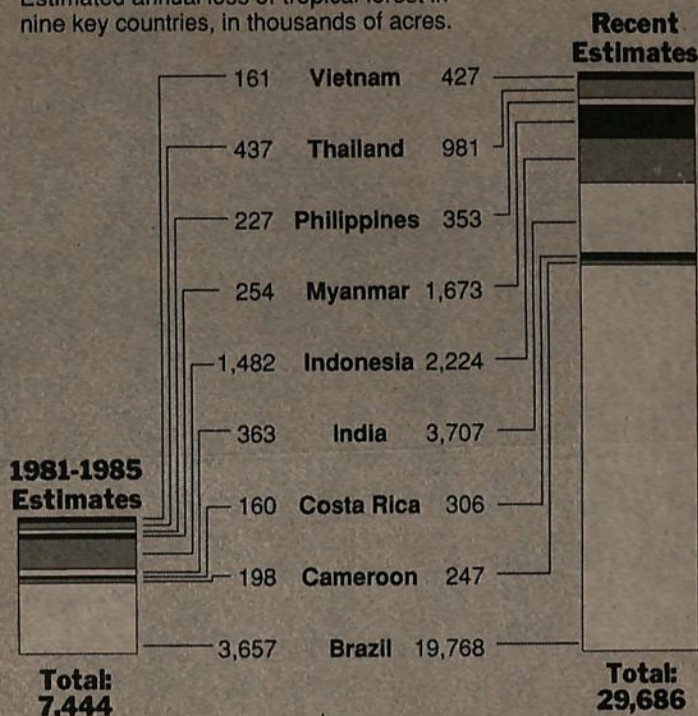
"We were startled to uncover this rate of global deforestation," said James Gustave Speth, president of the institute, a Washington-based research and policy organization. "We were saying we were losing the forests at an acre a second, but it is much closer to an acre and a half a second."

The disappearance of tropical forests is regarded by environmental experts as one of the most serious global environmental problems. Through photosynthesis, the forests absorb huge quantities of carbon dioxide, the most important of the gases that are accumulating in the atmosphere. Many scientists believe that carbon dioxide, if not kept in check, will cause a significant warming of the earth in the next century, through a process known as the greenhouse effect.

The report on forests was based on remote sensing data from National Oceanic and Atmospheric Administration and Landsat satellites that was or-

## The Tropical Forest Retreats

Estimated annual loss of tropical forest in nine key countries, in thousands of acres.



Sources: Food and Agriculture Organization of the United Nations, World Resources Institute

The New York Times

# Loss of Tropical Forests Is Found Much Worse Than Was Thought

Continued From Page A1

ing phenomenon. Moreover, as the vegetation from the cut forests decays or is burned, it emits more carbon dioxide into the atmosphere.

The tropical forests also contain the largest and most diverse populations of plant and animal species of any habitat in the world. As the forests vanish, so do many of these species, many before they ever have been discovered, named and analyzed for possible use by human beings.

Tropical forests generally have infertile soil because most of the nutrients are in the vegetation, not the soil. Thus, when these forests are cleared they tend to regenerate very slowly, if at all.

"Tropical deforestation is an unparalleled tragedy," said Mr. Speth. "If we

acres. In the past, most of the losses were in the temperate forests of Europe, Asia and North America. In recent years, however, it is the tropical forests of the developing countries of Latin America, Asia and Africa that have been disappearing most rapidly.

Brazil, with the largest remaining tropical forest area, is also experiencing the worst losses — between 12.5 million and 22.5 million acres a year, the report found. Myanmar is losing 1.7 million acres a year, more than 500 times the 1980 estimate by the Food and Agricultural Organization.

India, according to the data, is losing its forests at a rate of 3.7 million acres a year. Large areas legally designated as forest land "are already virtually treeless," the report said.

Indonesia is losing 2.2 million acres a year, and Costa Rica 300,000 acres, both substantially more than the 1980 estimate.

The problem of deforestation in developing countries "has been exacerbated by government economic, land tenure and agricultural policies as well as population pressures, poverty and debt," the report said. It added that the rapidly increasing populations in developing countries will put even more pressure on the forests.

The World Resources report also contains a new index of countries that are the greatest net contributors to the atmosphere of carbon dioxide, chlorofluorocarbons and methane, the major gases contributing to global warming.

The United States and the Soviet Union are the first and second-largest net producers of these greenhouse gases, the report found. It added that if the European Community were considered a single country, it would rank second behind the United States.

But the next three countries on the index, surprisingly, were developing nations, Brazil, China and India.

It has been widely believed that the industrialized countries are the main producers of greenhouse gases. But the research group found that the developing countries already account for 45 percent of emissions of these gases, and that their contribution is likely to rise sharply as they consume more energy for industrial development.

While there is still scientific uncertainty about the timing and magnitude of global warming, Mr. Speth said, the overwhelming scientific consensus is that "the risks of global climate change are very real and it would be very shortsighted to conclude otherwise."

## A tragedy without parallel is seen if the tree cutting goes on.

don't reverse the trend soon, it will be too late."

Senator Patrick Leahy, Democrat of Vermont and chairman of the Senate Agriculture Committee, said in a statement: "This is the first reliable data we've had on tropical deforestation in 10 years. A situation we knew was bleak is now shown to be truly horrendous."

The World Resources report was prepared in collaboration with the United Nations Environment Program and the United Nations Development Program. Joan Martin Brown, special adviser to the executive director of the United Nations Environment Program, said at the news conference that her organization did not have its own capacity to do the kind of research contained in the report. She said the information would be "very important" as the international community moves to respond to the global environmental threats.

Since preagricultural times, the report said, the world has lost about one-fifth of all its forests, from more than 12 billion acres to under 10 billion