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ASSOCIATION FOR TROPICAL BIOLOGY AND CONSERVATION

Organization for Tropical Studies

Tropical Forests Tomorrow - No future?

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IN THIS ISSUE:

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"If human societies can then exercise the self-restraint to utilize rain forests by working within their natural limits the cries of doom and gloom of the late 'eighties will have served a useful purpose. This is a big 'if'." Timothy Charles Whitmore (1990, p. vi) (1935-2002).

Forty years ago, in the French movie "That Man From Rio" (1964, by film maker Philippe de Broca), Jean-Paul Belmondo played a French airforce pilot who sets out to rescue his girlfriend, who has been taken to Brazil to help locate a lost treasure in the mythic Amazonian rainforest. In the beginning of this Hollywood-like adventure, one sees Adrien running through the young city of Brasilia, passing modern, concrete and futuristic buildings, driving along concrete, strip avenues. For a few seconds, behind the action, one can glimpse a tropical forest at the city edges. At nearly the same time, in 1963, the Association for Tropical Biology [and Conservation] (ATBC) was created. In parallel, Tim Whitmore was starting his promising career. More than a year after he passed away in 2001, Whitmore was celebrated and honoured during the ATBC-British Ecological Society meeting held July 7-11, 2003 in Aberdeen, Scotland, UK (www.atbio.org). Now, at the turn of the second Millennium, we learn that deforestation rates in the Amazon steadily increased between 1990-2000. Unfortunately, future scenarios, either pessimist or optimist, still suggest a grave loss of tropical habitats. Paraphrasing Tim Whitmore in his famous book *An Introduction to Tropical Rain Forests* one may ask, is there a future for tropical rainforest?

Indeed, the penultimate ATB annual meeting, entitled "Tropical Forests: Past, Present, Future," was held July 29- August 2, 2002 in Panama City, Panamá. Coincidentally or not, the title recalls the last chapter of Whitmore (1990), entitled "Tropical rain forests yesterday, today, and tomorrow." Time indeed is an important, if not crucial factor in science, especially for the conservation of tropical forests. Forty years clearly means nothing for those giant trees of the tropical rainforests, but it encompassed virtually the entire career of Tim Whitmore, who dedicated his life to the study of the southeast Asian tropical rainforests, their diversity and their conservation (Chazdon 2002). Tropical giants are indeed disappearing, in the double sense, and we are facing the future with that strange bitter taste in the mouth. What have we done so far during these past four decades? What remains to be done during the next 20, 40 years? What is our next challenge? In other words, how much time do we have left to study, protect and conserve what will soon remain of tropical forests? At the scale of the forest one may answer, "so little;" at the scale of human life, the answer may be "so much." But these questions have been the focus of many papers and symposia at the recent ATBC meetings in Panamá and Aberdeen.

Years ago, as Chazdon and Whitmore's edited book reminds us (Chazdon and Whitmore 2002; Zagt 2003), tropical biologists like Daniel Janzen (Janzen 1970), honoured 2002 ATBC fellow, and Joseph Connell (Connell 1971; Connell 1978), 2003 ATBC fellow, inspired many young biologists to focus their work to increase our understanding of tropical forest systems. Over these past three decades, a plethora of scholarly works have been published on the biology and ecology of tropical forests. Meanwhile, roads have been laid and forests cleared (e.g. Laurance 1999). In the early 1970s, fragmentation and logging were not generally issues being debated by biologists. The ATB was just beginning, with only a few members, nearly all from the neotropics. As early as 1970, Joe Connell was inspired to start long-term studies on seedling recruitment, ending recently with 30 years of data (Connell and Green 2000). In the 80's, ecological processes were starting to be studied and published, especially emphasizing plant-animal interactions. Young researchers started permanent plots (Hubbell and Foster 1983), which have resulted in a substantial body of published

work (Hubbell et al. 2001), and have also inspired work on many other subjects related to tropical forest biology (Harms et al. 2001; Harms et al. 2000; Wright et al. 1999).

In parallel, starting in the late 70's, visionary scientists concerned by the destruction of tropical forests started long-term projects related to agriculture and forest fragmentation (Lovejoy et al. 1984). The BDFF project alone, today, has gathered more than 22 years of data, and has generated over 500 papers and theses (Bierregaard et al. 2001, Laurance et al, 2001) (Figure 1). One may additionally remark that over the 80's, ecological processes, such as pollen and seed dispersal, remained poorly analysed in all these fragmentation studies. The Janzen-Connell 'seeds' were maturing, passing from one generation to another toward the end of the Millennium. Then, in the 90's, the vast deforestation rate of the last decades and the dedicated work by hundreds of biologists bore fruit, and the "seeds" reached adulthood, disseminating quickly into all scientific communities. At last, foresters and managers started to acknowledge that trees recruited poorly beneath or away from parent trees, a simple matter of fact for most ecologists as early as in the 80's. As often emphasized during the Aberdeen meeting on "Biotic interactions in the tropics," seeds that are not dispersed away from the parent are heavily attacked by vast populations of invertebrate and/or vertebrate seed and seedling predators that are no longer limited by top-predator pressures. How long will these trees survive without effective dispersal? Dan Janzen said that such isolated standing trees were reproductively dead (Janzen 1971), and later, Kent Redford coined the empty forest concept (Redford 1992). Today, the future of tropical rainforests, especially that of the Amazon (Laurance et al. 2002a) seems quite uncertain. In other words, are today's rain forests dying, transformed into collapsing fragments with no possible resilience?

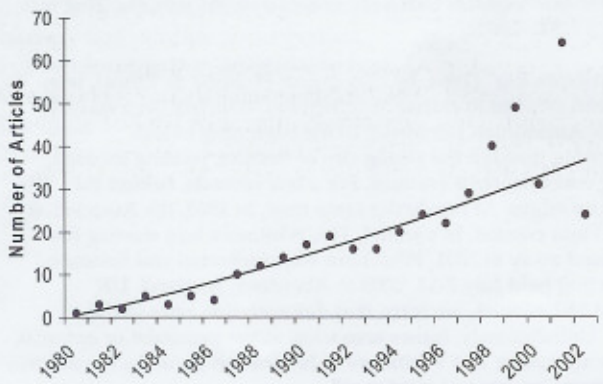

Figure 1. Publication rates (1980-2003+ in press) of the Biological Dynamics of Forest Fragments Project in Manaus, Brazil (database online at www.inpa.gov.br/pdbff). (Power function: $R^2 = 0.872$, $df = 1,22$, $F = 150.33$)

The 80's generation, those who are now 40+ years old or so, were very young, virtually babies when ATB was created, and our challenge was to study tropical ecology, in a time when we had many more questions than answers. The unknowns of the tropics were what drew us. We put together a vibrant scientific community studying seed and seedling biology, and then, facing increasing demand by managers, we progressively shifted our questions to more applied topics, studying the effects of logging, fragmentation, edge effect, land use, etc... We thus became tropical conservation biologists, just as the ATB's name officially changed to ATBC this year. Our initial goals and purposes have also changed, as shown by the increasing interest in studies on fragmentation, hunting and other human impacts, restoration, land use and management of forest production, conservation, remote sensing and global climate change during the most recent ATB(C) annual meetings. We urgently need to protect and conserve the forest, especially to save those small and large seeds without which forest restoration and maintenance of diversity is impossible. In the majority of cases, without dispersers, most seeds are dying, and then without seedlings, there is no recruitment. Fragmentation affects gene and seed flow, while logging, hunting and other human pressures dramatically affect animal and tree communities as a whole.

Let's take an example, that of a so-called 'sustainable resource.' Giant Brazil nut trees (*Bertholettia exelsa*, Lecythidaceae) are bee- pollinated (Mori and Prance 1990) and rodent-dispersed (Peres and Baider 1997). We now know that forest fragmentation affects both of these crucial plant-animal relationships for plant regeneration via disappearance of native pollen- and seed-dispersal agents (Bierregaard et al. 2001; Dick 2001; Powell and Powell 1987). The 'seed' resource is then no more sustainable for animals, as it is for the forest or for humans. Though cutting trees is illegal, standing trees in pasture are indeed reproductively dead *sensu* Janzen (1971). And there is virtually no hope that those giant isolated trees will be dispersed and will recruit (See Peres et al. 2003) in such empty forests *sensu* Redford (1992). The challenge is even greater than in the early 60's or 70's, but time is passing so fast, too fast at human scales. Amazonian forest has disappeared rapidly during the last ten years (Laurance et al. 2001). The Biological Dynamics of Forest Fragments Project (BDFFP) started 24 years ago, and we have learned many lessons from that important program (Bierregaard et al. 2001). In the last decade since the release of the first edition of Whitmore's book (1990), the publication rates of the BDFFP have steadily increased, with up to 71 Ms and Ph.D. theses, 482 articles and book chapters (updated September 2003, Figure 1) on the effect of forest fragmentation in the Amazon (Laurance et al. 2001). At the same time, paradoxically, deforestation rates also continue to increase, especially during the last decade (1990-2000).

One might then question whether these two decades of intensive studies will help to slow down the process of deforestation in tropical rainforest as a whole, and in South America in particular? Hopefully yes, but maybe not. And we need to exert just as much effort today, to learn about the effects of human pressures on the forest, as was expended in the past, to decipher the effects of fragmentation. Paradoxically, the more we learn about rainforests, the faster they are disappearing, while the carbon from burning trees evaporates into the atmosphere or sinks into the oceans. According to predictions based on deforestation rates (Laurance et al. 2001) and rates of disappearance of the Amazonian forest flora (Laurance et al. 2000a) and fauna (Laurance et al. 2000b), twenty years from now it will be just too late. Despite the critical lack of studies to demonstrate it, one of the key conservation lesson we learned from the BDFFP is that "trees in fragments and surrounding altered habitats may play an important role in regeneration by providing a source of seeds and attracting seed dispersers out of nearby primary forest" (Benitez-Malvido 2001). We thus urgently need to conserve those reproductive trees, inside fragments and outside, and to replant those seeds, just as Kayapo Amerindians propagate plants in a variety of forest habitats (Posey 1992, and pers. comm.), just as do rodents in neotropical forests as a whole. Seeds need to be planted in more than one way. They need to be planted in people minds, to inspire and to change the daily routine of scientists in investigating tropical questions. But they also need to be planted in pasture, in secondary forest patches and fragments, and in green houses, which are our equivalent of zoos, but for disappearing plants. Large, recalcitrant tropical seeds cannot be stored in Museums, and it is indeed only through such extensive plantations that we may save the forests and prevent the mass extinction of species that is looming on the horizon. But then, if we can restore the forests, and maintain those large-seeded lynchpins of tropical diversity - then, animals will come back if they are still available in the surrounding 'full' forest.

In his second edition, Tim Whitmore modified the 10th and last chapter. He used it as a springboard to pose not just one, but two questions for our generation. "Tropical rain forests yesterday and today" was altered to become a new, 11th chapter entitled "Tropical rain forest at the cusp of the new Millennium." In this new version of Whitmore, emphasis on 'conservation' disappeared. Instead, his text mainly focused on 'management', 'forest certification', 'land use' (including forest production, plantation, and fragmentation), and 'priorities for action.'

And so here we are now. The third Millennium carpet is unrolling in front of us just as deforestation is leaving behind empty biotopes and collapsing forest patches. Some 40 years later, after re-reading the most recent papers of Laurance et al. (Laurance et al. 2001; Laurance et al. 2000a), and once again the 10th and 11th chapters of the two editions of Whitmore's

books, should we claim today that there is 'no future' for tropical rain forests tomorrow? After studying for nearly two decades in neo-tropical forests, I was actually lucky enough to be able to revisit seedlings, and I may still have some good chance to do that for the next 20 years.* Very few scientists may have such a great chance (Connell and Green 2000). Tropical rainforests and study sites are disappearing forever, just as is the exotic and fantastic Amazon which so much fascinated and intrigued the audience watching the tribulations of Jean-Paul Belmondo in Brazil in the early '60s. Perhaps we do best to recall, in closing, Tim Whitmore's words (first edition, p. 195) which somehow perfectly summarize our feeling in this early Millennium: "We live in an interesting Age. What will our descendents think of us as they look back? All is not yet lost of the world's tropical rain forests but it is difficult to be optimistic about their future."

Today, Tim Whitmore would certainly still be optimistic, especially after learning that the Brazilian government, on August 22, 2002, created the world's largest rain forest National Park in Northern Amazonia. The new park, 3,870,000 hectares in size, is located in Brazil's state of Amapa along the boundary with Guyana, Suriname and French Guiana. The protection of this tract of remote, unexplored Guianan-type rain forest is definitely a step forward in the conservation of this unique habitat. The size of Belgium, the park, however, protects an area that represents only 20 percent of the mature Amazonian forest that has been lost between 1990-2000, (i.e. more than 18 million hectares) (Laurance et al. 2001). We have much, much more that remains to be done. Our energy needs to be directed, all over the world, to studying the ecology and conservation of tropical forest diversity. And we need to do this now, and in the next 20-40 years, all the time working to be sure that, at the same time, this diversity will not then vanish forever.

*Post-scriptum: Since I wrote this paper, an important goldmining rush is expanding into the Nouragues Reserve, and the future of this Guianan forest has now, also, become very uncertain.

Acknowledgements. I am indebted to Rita Mesquita for sending me the most updated references from the BDFFP (www.inpa.gov.br/pdbff) and to Bill Laurance and Tad Theimer for encouragements to publish this essay.

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Plant resins: Old friends of people, new frontiers for tropical biologists

Book review of *Plant Resins: Chemistry, Evolution, Ecology, and Ethnobotany*. Jean H. Langenheim.Timber Press, Portland, Oregon, 2003. 586 pp., illus. $49.95 (ISBN: 0881925748 cloth).

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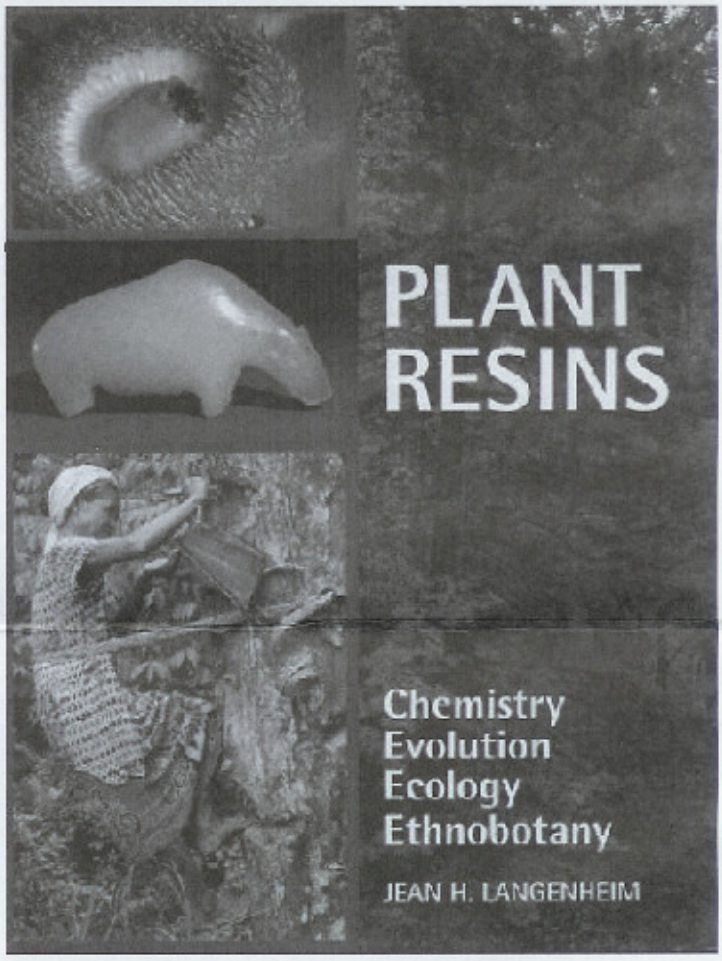
Plant Resins: Chemistry, Evolution, Ecology, and Ethnobotany by Dr. Jean H. Langenheim is the best and most comprehensive work about plant resins since Frank N. Howe's classic book *Vegetable Gums and Resins* was published in 1949. The book's ambitious goal is to present a interdisciplinary look at plant resins, including their formation, composition, defensive functions, and importance to the many insects and mammals (including people) that also use them. The book has three major sections. The first part describes the production of resin by plants, with chapters focusing on the definition and basic chemistry of different types of resin, a summary of the evolution of resin-producing plants, and a description of plant structures involved in resin secretion and storage. The second part covers the geological history and ecology of resins, with chapters explaining what is known and what remains a mystery about amber (fossil resin) and the interactions between plants, resins, and herbivores. The final section deals with the ethnobotany of resins, with chapters focusing on the past importance and future use of resins and on specific types of resins, including balsams, oleoresins and varnish resins.

The book covers resins found in all types of plants around the world. Since so many resin-producing plants are found in warm climates, many of the basic lessons and case-studies about the anatomy, physiology, ecology and ethnobotany of these plants are based on tropical taxa. The chapter on the ecological roles of resins features a clear synthesis of work on the diversification of resin-duct structures and resin chemistry in several tropical genera and their interactions with various fungi and herbivorous insects. It also highlights how plant resin can play a role in the ecosystem, particularly in cases where bees that are important pollinators depend on plant resins to build their nests and safeguard their young. The ethnobotany part presents summaries of a host of tropical resins including oily resins from tropical angiosperms, leguminous and other balsams, Neotropical and African copals, New and Old World elemis, dammars used in varnish, and resins used for drugs.

One of the book's simplest yet key contributions is presenting clear definitions of what plant resins and their sub-categories are and are not. These explanations give readers a solid basis for understanding the many dimensions of this book and making better sense of other works using ambiguous or inaccurate meanings about resins and other plant exudates. Langenheim points out, for example, that the trade term "essential oil" which refers to volatile terpenes in some plants, is misleading out of the context of an industry context because these compounds are "neither essential to plant metabolism nor are they true oils; essential refers to their essence or fragrance, and oil to their feel." The simple explanations of the basic classes of terpenoid and phenolic resins are particularly useful for non-chemists since they describe how differences in resin composition affects the extent to which a resin remains fluid or hardens after exposure to air, a key property that Impacts its ecological function or human use.

Any tropical researcher who has studied resin-producing plants or worked with people who collect, use and sells resins will gain a deeper understanding of the diverse roles that resins play in the defense and ecophysiology of these plants, the role of resin in natural ecosystems, and the historical importance of future potential use of resins by people. *Plant Resins* provides a sterling example of the way biologists can learn more about a system by synthesizing information and insights from chemists, botanists, ecologists, and anthropologists. As an ecologist who studies the ecological interactions between resin producing trees, insects and human collectors, I read every part of this large work with great interest. Each chapter in Parts 1 and 2 of the book provides a building block for a subsequent chapter, but the sections in these first two parts, which feature short stories of specific resins, are crafted so they can be read independently. Each paragraph contains many references, but every phrase does not have a corresponding citation. This format makes the text flow more easily than scientific journals, and at its best, it tells wonderful stories. The downside of this style is that a researcher may not have an easy time identifying the source of a particular point. The detailed illustrations including maps, plant and plant parts, chemical structures, and flow charts provide an excellent complement the text. The color and black and white photographs bring to life the processes relating to resin formation and harvest. The glossary provides a quick reference to technical terms and will even assist readers with no scientific background to easily understand most of the book's concepts. The appendices pull together comprehensive lists of resin-producing



genera of conifers and angiosperms and matches between resin common names with the scientific name equivalents.

Dr. Langenheim draws heavily on her own extensive work, and she effectively connects the salient points from hundreds of other researchers. When she believes other researchers' conclusions are not supported by solid evidence, however, she does not accept their views without reservation. She critically analyzes the information available on plant resins from diverse sources in a holistic way and recommends topics that should be investigated in the future. Some of the enticing

puzzles that investigators will confront include elaborating resin formation processes in plants, unraveling the complex physiological and ecological resin interactions with insects, and exploring new ways that people can use plant resins. *Plant Resins* will become the standard reference for this topic because it brings together the many aspects of plant resin research and will inspire the next generation of researchers to probe new resin mysteries.

International Symposium for the Organization for Tropical Studies' Minority Scholars Program - *Fostering A Diverse Scientific Community: Developing Strategies for Identifying, Recruiting and Retaining Minorities in Environmental and Biological Science*1, 12-13 August 2004. Howard University, Washington, DC.

This scientific symposium will recognize and highlight the research accomplishments of the OTS Minority Scholars Program. Current and past U.S. fellowship recipients (African American, Hispanic and Native American), as well as Costa Rica and South Africa OTS scholars, are invited to present oral and poster presentations of their research projects. The event also includes internationally recognized speakers in the biological and environmental sciences.

The goals of the symposium are 1) to focus on the achievements of minorities in the biological and environmental sciences and, 2) to encourage greater participation of under-represented groups at the undergraduate, graduate and pro-fessional levels in the biological and environmental sciences.

All interested individuals are invited to attend, including students and faculty researchers in the biological and environmental sciences, alumni, friends, and members of the broader scientific community. For additional information, please contact Gwen Wright with the Organization for Tropical Studies at gwright@duke.edu or (919) 668-1687.

Visiting International Graduate Student Fellowships in Tropical Studies at University of California, Santa Cruz

The Center for Tropical Research in Ecology, Agriculture, and Development (CenTREAD) is pleased to offer two fellowships for one-quarter (3 months) post-graduate residence at the University of California, Santa Cruz (UCSC) during the 2004-2005 academic year. Graduate students, recent university graduates, and environmental professionals from tropical and subtropical nations who have not received degrees from and are not enrolled in US universities are eligible to apply. Fellows will participate in graduate courses related to their interests, attend seminars, and work with UCSC research groups to develop collaborations with CenTREAD affiliates. CenTREAD researchers are involved in a wide range of natural and social science investigations on tropical issues that further the CenTREAD mission- "To foster interdisciplinary research and training to understand tropical environmental issues and develop ecologically-based, economically viable, cul-turally respectful, nonexploitative solutions that serve as a found-ation for future generations." More information on participating faculty, CenTREAD activities, participating departments, and related courses is available on line at http://centread.ucsc.edu.

Through the generosity of an anonymous donor and the Pepper-Giberson Endowed Chair, CenTREAD will provide Fellows round-trip transportation, tuition, and a $1000 per month stipend. To apply, please send (1) a curriculum vitae, (2) a personal statement describing your educational and research experience, future goals, and reasons for interest in participating in the participating in the program, (3) a confidential letter of recommendation from someone familiar with your academic performance or research. In addition, applicants must arrange for a letter of support from a CenTREAD faculty member at UCSC. Mexican nationals are not eligible, but are encouraged to contact CenTREAD faculty regarding the possibility of visiting fellowships through other funding sources. Application materials can be sent electronically to ggilbert@ucsc.edu or to: CenTREAD Fellows, c/o Greg Gilbert, Environmental Studies, 1156 High St., University of California, Santa Cruz, CA 95064, USA. Review of applications will begin 10 May 2004 and applicants will be notified by 1 June 2004. Fellows' stays should coincide with a UCSC academic quarters - Fall (mid-September to mid-December 2004), Winter (January to March 2005) or Spring (April to June 2005).

LETTERS TO THE EDITOR

To the Editor:

I am writing to provide another perspective on the book Les chauves-souris de Guyane which was reviewed by Don Thomas in "Bats of Two Hemispheres" in Tropinet 14, no. 1 and 2. This book is intended as a survey of the bats of French Guiana, and to that end, I believe that it does exactly what it suggests, i.e., serve as a guide to the bats of French Guiana.

I am interested in bat/plant interactions, especially in French Guiana, (see bat pages at http://www.botanypages.org), and we have used Les chauves-souris with a great deal of success to identify bats we have captured. This book is an excellent and useful survey of the bats of this part of northern South America, and I hope that potential users with an interest in Guianan bats will purchase and employ this book with great success.

Scott A. Mori, Nathaniel Lord Britton Curator of Botany
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To the Editor:

I was browsing through Tropinet last night and noted a mis-statement by T. Mitchell Aide and Miguel Acevedo. In the last paragraph of their review they say "How many more students would have been impacted if books like Costa Rican Natural History (D. H. Janzen) or A Field to Woody Plants of Northwest South America (A. H. Gentry) had been translated into Spanish?"

For the record it should be noted that Historia Natural de Costa Rica—edited by Daniel H. Janzen, translated by Manuel Chavarría A., and the scientific translation revised by Luis Diego Gomez P.—was published by the UCR press in 1991 under the auspices of OET. This 822 page book took a tremendous effort on the part of a number of people. It's too bad the book is not better known.

Donald E. Stone, Professor & Chair Emeritus of Botany, Duke University
Executive Director Emeritus, Organization for Tropical Studies
Interim CEO, OTS

NEW BOOKS ON TREES OF THE CARIBBEAN BASIN

Arboles Centroamericanos: un manual para extensionistas

Edited by Jesús Cordero and David Boshier

The diverse biological, environmental and cultural conditions of Central America require diverse approaches to sustainable farming. Trees are a vital component of most Central American farming systems, but often only a limited range of management options and species are promoted for planting. Oxford Forestry Institute and CATIE have published a manual in Spanish covering the use of 199 indigenous species within the context of farming systems, farmer constraints and preferences. The book is aimed at extension services and rural development organisations involved in promotion of sustainable land use options in Central America. The manual provides indications of which species appear best suited to different farming systems (for instance, small blocks, living fences, trees in fields or pastures, natural regeneration). The supporting CD-ROM contains a searchable data base and images to facilitate the production of extension materials. The materials were developed and tested in co-operation with extension networks in Central America, with species selection based on farmer preferences from a large number of surveys. The manual is distributed free within Central America through a training program of courses coordinated by CATIE. Course participants include a mix of technical foresters, agroforesters, agronomists and extensionists from rural development agencies.

The book and associated dissemination activities are funded by the Forest Research Programme of the UK Government's Department for International Development (DFID). The book is available outside of Central America from April 2004 on the project's web page www.arbolesdecentroamerica.info.

For information about training courses, interested parties should Guillermo Detlefsen in Costa Rica, at gdetlef@catie.ac.cr - Tel +506 558 2591. For information about the manual and project, persons should contact the authors in the UK. Jesús Cordero: jesus.cordero@plants.ox.ac.uk - Tel +44 (0)1865 275130 or David Boshier: david.boshier@plants.ox.ac.uk - Tel +44 (0)1865 275128

JAMAICAN MANUAL OF DENDROLOGY

The *Manual of Dendrology – Jamaica* is the result of nearly 2 years of fieldwork and research on the Jamaican tree flora. The 494-page book provides descrip-tions, color photographs, and keys for 150 species of trees indigenous to or naturalised in Jamaica. Sample pages can be seen at http://www.forestry.gov.jm The *Manual of Dendrology – Jamaica* was developed by Dr. Tracey Parker with assistance from the Forestry Department, and was funded by the Canadian International Development Agency through its Trees for Tomorrow Project. To purchase this book contact: John Latham, Trees for Tomorrow Project, Forestry Department, 173 Constant Spring Road, Kingston 8 Jamaica (West Indies); Tel/Fax: (876) 931-2856; Email: jlatham@forestry.gov.jm. All proceeds from sales of the *Manual of Dendrology – Jamaica* go to the National Forest Management and Conservation Fund. Overseas orders: Price is US$30.00 plus shipping and handling. Please inquire for shipping costs to your location. All orders must be prepaid by international money order or bank draft payable to "The Forest Fund."

BOOK SALE: Mamíferos de los bosques húmedos de América tropical: Una guía de campo. 1999. Louise Emmons & Francois Feer (Spanish edition of Neotropical Rainforest Mammals), is available on special price sale of $25 including postage within Latin America, from editorial@fan-bo.org. The Spanish edition is the most up-to-date and includes revisions not present in the English edition.

LIBRO EN VENTA: Esta primera edición en español es revisada y actualizada. Servira para todos los cientificos, estudiantes, guardaparques, instituciones y autoridades mejorando la investigación, la conservación y el manejo de la fauna silvestre del América tropical. La versión española ha sido publicada por la Fundación Amigos de la Naturaleza Nöel Kempff (FAN, Bolivia: http://www.fan-bo.org/editorial/). Para mayor información y precios especiales diríjase a Silvia Añez: mail to editorial@fan-bo. Editorial FAN, Casilla 2241, Santa Cruz de la Sierra – Bolivia. Tel: 591-3-3556800; Fax: 591-3-3547383.

BIODIVERSITY RESOURCES

BIODIV-L is a new, moderated listserve to provide information on issues in international biodiversity policy. The goal of the list is to encourage discussion about international policies on biodiversity conservation and sustainable use. It was established by the International Program at Defenders of Wildlife, an NGO based in Washington, DC. It is intended for stakeholders, policy developers, NGOs, IGOs, researchers and government officials dealing with biodiversity issues, indigenous peoples, and local communities. This list is expected to include discussions related to international conventions such as the Convention on Biological Diversity, biodiversity-related work under international institutions such as the Global Environment Facility, the World Bank, UNEP and UNDP; international processes such as the Millennium Ecosystem Assessment, the Global Invasive Species Program and biodiversity data/informatics initiatives; and current international biodiversity issues such as protected areas, access to genetic resources and benefit-sharing, traditional knowledge, relevant trade issues and biosafety. To subscribe to BIODIV-L send an e-mail message to: biodiv-request@list.defenders.org and in the body of the email include: *subscribe biodiv-l first_name last_name*.
You will then receive additional information on confirming your subscription and how to post messages to the list. Questions or commentscan be directed to Stas Burgiel, at biodiv-moderator@list.defenders.org.

ROYAL SOCIETY REPORT AVAILABLE ONLINE
A report on global biodiversity monitoring, issued by the Royal Society London (UK) in September 2003, is now available in its full version on the web. The address for access is: http://www.royalsoc.ac.uk/files/statfiles/document-232.pdf. In this report, the Royal Society examines methods of measuring biodiversity in order to monitor species losses and to chronicle the current state of global biological variability. Without standardized methodologies or methods of synthesizing known information, the target goal developed by the World Summit on Sustainable Development that, by 2010, nations of the world achieve "a significant reduction in the current rate of biodiversity loss" is elusive. The Royal Society report recommends a framework for such measures, to identify areas of particular concern and for develop realistic short-term programs for such global biodiversity conservation.

***La Fundación Ceiba is seeking** a reserve manager for the El Pahuma Orchid Reserve in Ecuador, a cloud forest reserve and nature center located outside of Quito. Go to www.ceiba.org/pahuma.htm for more information. The applicant should be bilingual (Spanish/English) and have prior experience in business management, preferably in a park, reserve or tourism-based business. Position starts in June or July 2004. Send a letter highlighting your relevant experience along with your CV and complete contact information and three references to mail@ceiba.org or by fax to (USA) 773-871-3798.*

MEETINGS CALENDAR FOR TROPICAL BIOLOGISTS

2004

International Orchid Conservation Conference, 17-21 May 2004. Marie Selby Botanical Gardens, Sarasota, Florida. Information at: http://www.selby.org/iocc/index.htm

84th Annual Meeting of the American Society of Mammalogists, 11-16 June 2004 at Humboldt State University, Arcata, California. For additional information, please visit the meeting website at http://www.humboldt.edu/~asm/

9th Congress of the International Society of Ethnobiology (ISE) 13-19 June 2004. University of Kent, Canterbury, UK. http://www.kent.ac.uk/anthropology/ice2004/index.html

Association for Tropical Biology and Conservation Annual Meeting, 12-15 July 2004. Miami, Florida. Organized by the University of Miami, Florida International University, and CETROB. Information at www.atbio.org/meetings/

International Association of Vegetation Science, 18-23 July 2004. Kailua-Kona, Hawaii Island, Hawai'i, USA. The theme is "Landscape Change and Ecosystem Disturbance: Islands and Continents." Information is available at http://www.iavs.org/hawaii.htm or from the organizers at iavs2004@hawaii.edu

7th Intecol International Wetlands Conference, 25-30 July 2004. Utrecht, Netherlands. See information at http://www.bio.uu.nl/intecol/index2.php

2nd Tropical Montane Cloud Forest Symposium, 27 July – 1 August 2004. Waimea, Hawai'i. The theme is "Mountains in the Mist: Science for Conserving and Managing Tropical Montane Cloud Forests." Contact: Lawrence Hamilton; Tel/Fax 802-425-6509 or druid@ggmavt.net

Society for Conservation Biology Annual Meeting, 29 July - 2 August 2004. Columbia University, New York, New York, USA. The theme is "Conservation in an Urbanizing World." Website, http://www.conbio.org/2004. Questions? Contact Eva Fearn at 2004@conbio.org

89th Annual Meeting of the Ecological Society of America, 1-6 August 2004. Portland, Oregon. Information can be found at: http://www.esa.org/portland/

International Symposium for the Organization for Tropical Studies' Minority Scholars Program - Fostering A Diverse Scientific Community: Developing Strategies for Identifying, Recruiting and Retaining Minorities in Environmental and Biological Science, 12-13 August 2004. Howard University, Washington, DC. Contact Gwen Wright, gwright@duke.edu or visit the OTS website at http://www.ots.duke.edu.

The 5th International Symposium on Physiology, Behaviour and Conservation of Wildlife, 26-29 September 2004. Berlin, Germany. Main topics: management of captive and small populations, stress and disturbance, behaviour, reproduction biology and wildlife conservation. Further information is available from Dr. Christian C. Voigt, symposium@izw-berlin.de and the web: http://www.izw-berlin.de

3rd IUCN World Conservation Congress, 17-25 November 2004. Bangkok, Thailand. The theme will be "People and Nature: Making the Difference." Information is available at the IUCN website at www.iucn.org. The conference brochure can be found as a pdf file at http://www.iucn.org/about/wcc/wcc.pdf

2005

17th International Botanical Congress, 18 - 23 July 2005. Vienna, Austria. Nomenclatural sessions 12 - 16 July. The first circular, preregistration form, and guidelines for proposals are available on our Congress website http://www.ibc2005.ac.at/

Association for Tropical Biology and Conservation, Annual Meeting, 23-29 July 2005. Uberlandia, Minas Gerais, Brazil.

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ATBC is an international society that promotes tropical biology and conservation in its broadest sense. ATBC publishes the quarterly journal BIOTROPICA and sponsors annual meetings and symposia. Information: W. John Kress, ATBC Executive Director, Smithsonian Institution, US National Herbarium, Department of Botany, NBH 166, Washington, DC 20560.

OTS is a non-profit consortium of 65 academic and research institutions in the United States, Australia, Latin America, and Asia. Its mission is to provide leadership in education, research and the responsible use of natural resources in the tropics. Graduate, undergraduate and professional training and research facilities are provided at three field stations in Costa Rica. Information on OTS and *Tropinet* contributions: OTS, Box 90630, Durham, NC 27708-0630 USA.