

## U.S. MAB Chairman's Invited Lecture

Editor's note: Each year the Chairman of the U.S. National Committee MAB invites a distinguished scholar to present a public lecture which is held in conjunction with the summer meeting of the National Committee. In 1990, Dr. Daniel Botkin, Professor of Biology and Environmental Studies at the University of California, Santa Barbara, was invited and presented a lecture entitled "Discordant Harmonies: A New Ecology for the 21st Century." The following is a synopsis of that lecture.

### The Difference Between Nature Preserves and Strawberry Preserves

When we talk about establishing a new nature preserve and putting land aside for biological conservation, the words that we use are reminiscent of the way my in-laws in New Hampshire used to speak about putting up some jam and jelly for the winter. We talk as if nature were something that we could bottle, put on the shelf, and take down occasionally to savor or admire. This is the way that many nature preserves have been managed in the 20th century.

Hartwick Pines State Park contains the last uncut original white pine stand in the lower peninsula of Michigan — 50 acres; that is all that remains of the original 19 million acres of white pine forests that were logged between 1840 and 1920. The park is maintained as a recreation area as well as a preserve, and visitors walk through the old-age forest on pleasant trails. The ground around the big trees is trampled by many feet, and there is almost no regeneration

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## U.S. Department of State Extends Appointment of Dr. Lovejoy as National Chairman

Mr. E.U. Curtis Bohlen, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, has extended the appointment of Dr. Thomas E. Lovejoy as the Chairman of the U.S. National Committee for MAB through December 1992.

Mr. Bohlen, in making this extension of Dr. Lovejoy's appointment, noted that the Department of State was "...particularly pleased with the direction and guidance that you have provided to the U.S. MAB Program, especially in promoting the concentrated program areas of directorate activity while maintaining a receptivity to proposals from the wider scientific community. Your leadership and insistence upon the application of rigorous scientific review principles has significantly increased the program's credibility over the past three years."

Mr. Bohlen stated that the Department of State, along with the other supporting agencies of the U.S. MAB Program "...anticipate that this momentum toward excellence will only increase under your continued leadership in the years ahead."

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## Notes From the Executive Director

U.S. MAB Vice Chair, Dr. Michael A. Little of SUNY-Binghamton, attended as the U.S. Observer Delegate UNESCO MAB's semiannual Intergovernmental Coordinating Council (ICC) meeting recently held in Paris.

On the bureaucratic/ administrative, as well as image side of the ledger, substantial progress was achieved. In recent years the word "man" in the title of our program has been viewed by some as an anachronism. Well, the delegates didn't change the name of the MAB program; but, they did elect Dr. Tania Maria Tonelli Munhoz to Chair the ICC for the next 2 years. She is currently the president of IBAMA, the Brazilian Institute of Environment and



### U.S. MAB BULLETIN

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*"The mission of the United States Man and the Biosphere Program (U.S. MAB) is to foster harmonious relationships between humans and the biosphere through an international program of policy-relevant research which integrates the social, physical, and biological sciences to address actual problems. These activities—broadly interpreted—include catalytic conferences and meetings, education and training, and the establishment and use of biosphere reserves as research and monitoring sites." Adopted by the U.S. National Committee for the Man and the Biosphere Program, January 6, 1989.*

U.S. MAB is supported by the United States Department of State, the United States Department of Agriculture-Forest Service, the United States Department of the Interior-National Park Service, the Agency for International Development, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the Peace Corps, the Smithsonian Institution and the National Science Foundation.

The program is organized into five directorates: High Latitude Ecosystems; Human Dominated Systems; Marine and Coastal Ecosystems; Temperate Ecosystems; Tropical Ecosystems; and a U.S. MAB Coordinating Committee for Biosphere Reserves.

Renewable Natural Resources. Dr. Tonelli Munhoz will be well assisted in establishing international MAB policy and program direction by the election of an exceptionally strong team of science administrators as MAB vice chairs. All of the elected vice chairs also chair their respective country's MAB Programs: MinR. Wilfried Goerke, Germany; Academician Vladimir Sokolov, USSR; Mr. Yasuo Aruga, Japan; and, Mr. Sadig Bin Abdel-Hassine Al Mascatti of Oman. Mr. W.K. Nduku of Zimbabwe was elected rapporteur. The chairperson, vice chairs and rapporteur make up the UNESCO MAB Bureau which directs the international program between ICC sessions.

The ICC also directed the international MAB Program to make one of its primary areas of concentration the world scientific and environmental policy concerning global climate change. U.S. Observer Delegate Little addressed the ICC and spoke with numerous delegates concerning U.S. support for the recommendations made by a January 1990 UNESCO/MAB workshop on biosphere reserves. The workshop recommended the creation of a network, on a pilot basis, of biosphere reserves to share basic information concerning biological indicators of global change. In our view, the strength of the MAB program's potential contribution to international global change science and monitoring efforts stems from: first, the wide representation of the world's major terrestrial biomes within biosphere reserve sites — an admitted weakness in that coverage is the lack of marine/ocean representation; secondly, all biosphere reserves are required to have had some scientific infrastructure and research history — so a new system would not have to be built from the ground up; and thirdly, most biosphere reserves are governmentally operated — which augers well for the long term commitment required for a global monitoring program system. Dr. Little received strong support and expressions of interest from a number of delegates for such an initiative and cooperative effort.

Dr. Otto Solbrig, past chairman of the International Union of Biological Sciences (IUBS), and formerly a member of the U.S. National Committee for MAB, also addressed the ICC. He spoke about how to measure biological diversity and its role in ecosystem functioning. He was commissioned by the ICC to provide a report on the scientific rationale and underpinnings for initiating a global system of monitoring biological diversity. Dr. Solbrig will submit his report to the international MAB Bureau in 1991.

All in all, these could be very significant steps towards developing the often referred to "potential" for a network of biosphere reserves. U.S. MAB looks forward to working with all of the MAB programs toward achieving this goal.

Roger E. Soles

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## UNESCO MAB Northern Sciences Network Meeting

The UNESCO-MAB Northern Sciences Network met in Rovaniemi, Finland, September 25–27, 1990, at the Arctic Center of Lapland University. All NSN member states except Iceland were present at this meeting. U.S. MAB was represented by Drs. Patrick Webber, Dale Taylor of the National Park Service and Charles Slaughter of the USDA Forest Service.

The NSN meeting focused on four primary themes: High Latitude Biosphere Reserves, Research and Monitoring in Biosphere Reserves and Protected Areas; Sustainable Conservation and Development; and Subarctic Birch Forests. Dale Taylor discussed U.S. Northern Biosphere Reserves, giving special attention to current US-USSR collaboration in Beringia and Noatak Nature Preserve/Biosphere Reserve in northwest Alaska. Dr. Slaughter was elected to serve on a new International Advisory Group for the Northern Sciences Network which will be chaired by Dr. Fred Roots of Canada. Dr. Webber noted that U.S. MAB has allocated funds for the support of a fellowship at Rovaniemi to facilitate circumpolar communication and information exchange through the NSN Secretariat (see following position announcement).

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## ITEX—International Tundra Experiment

Nearly 40 scientists from nine countries, including the Soviet Union, gathered at Michigan State University's Kellogg Biological Station December 3–6 for a workshop in which they developed an Arctic experiment. They met to develop ITEX—the International Tundra Experiment to determine the impact of global warming on specific plants.

The meeting was organized by Dr. Patrick J. Webber, director of the Kellogg Biological Station and the chairman of the U.S. MAB Directorate on High Latitude Ecosystems. The National Science Foundation provided the funds for the conference while MAB contributed funds to assist in the conference's planning stages.

Webber stated that most scientists agree that as the Earth's atmosphere warms, the impact would have a compound effect on the polar regions. This is because we expect the polar regions to experience greater warming than other regions of the Earth and because arctic organisms are specifically adapted to life in the cold. "Northern natives hear rumors of the Arctic warming up. They also hear

scientists making predictions of one sort or another, but they haven't yet heard how the plants and animals in their lives will be affected," explained Webber. "What happens to the reindeer or whitefish or blueberry plant? No one has species-specific information to offer.

The agreements reached at this meeting build upon international cooperation mechanisms, and Webber said he hopes ITEX will be a model for studies of other arctic organisms. Among the agreements the scientists reached were that:

- the first ITEX experiments should focus on responses of vascular plant species;
  - a set of abiotic observations and destructive and nondestructive measurements be carefully specified to determine phenological events, reproductive and vegetative effort, physiological responses, and genetic response to the manipulation and predominant environmental variables during the growing season over a period of 3 years;
  - explicit protocols be developed for simple and relatively inexpensive manipulations of air temperature and snow cover at participating sites;
  - sets of selected individuals in field transplant gardens be subject to a common garden (environmental) experiment and assessed in terms of genetic variation within each species population and its phenotypic response in order to evaluate probable adaptations to climate change;
  - funding for research is the responsibility of each participating country and may utilize activities already underway, and including Biosphere Reserves, protected areas, and long-term ecological research areas; and,
  - future experiments focusing on other taxa and ecological parameters, including animals are desirable, and contacts for ITEX established through the MAB Northern Sciences Network are encouraged.
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## BUN—Biomass Users Network

Is an international not-for-profit membership organization created by and for developing countries to identify opportunities for improving rural economies while protecting natural resources. BUN facilitates information dissemination, scientific and technical cooperation, and funding for demonstration projects in biomass production and utilization.

For further information, contact P.O. Box 33308, Washington, D.C. 20033. Telephone (202) 293-4800.

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## **Available Positions in Arctic Science**

### **Fellowship in Northern Sciences Network**

Applications are requested for an individual who would spend up to six months based at the MAB Northern Sciences Network headquarters in the Arctic Center, University of Lapland, Rovaniemi, Finland.

The fellowship would provide up to \$3,000 per month for salary, cost-of-living allowance and travel funds.

The Northern Sciences Network (NSN) is a program of the UNESCO Man and the Biosphere (MAB) Program which distributes information about ongoing Arctic and northern research through a newsletter and also acts as a clearing house for information on special problems such as sustainable development, human/environment interactions and global environmental monitoring as they relate to northern lands.

The Fellow would be expected to help with newsletter development, international communication and the development of international programs in northern science such as the International Tundra Experiment (ITEX) or the Norwegian northern pastoralist project. There will also be opportunities for personal research.

Candidates should have a Ph.D. degree or its equivalent and research experience in social and/or environmental sciences. The position has no citizenship or residency limitation.

The fellowship will be administered by Michigan State University. Applications are to include curriculum vitae and names of three references. They should be sent to Professor P.J. Webber, Chair, U.S. MAB High Latitude Directorate, W.K. Kellogg Biological Station, Hickory Corners, MI 49060-9516. Applications will close by March 1, 1990.

Michigan State University is an Equal Opportunity Employer.

### **Director of Arctic Environmental Information and Data Center - University of Alaska, Anchorage**

The Director is responsible for the overall direction and management of the Arctic Environmental Information and Data Center. The Center's mission focuses on developing innovative methods of applying science and technical knowledge to examine natural resource and environmental problems, to assess environmental risks and consequences and to project ecological interactions and trade-offs of resource use.

This is a full time administrative appointment with an academic appointment in the School of Public Affairs. Salary will be a minimum of \$70,000. Potential applicants must contact the Personnel Office, University of Alaska Anchorage, 3211 Providence Drive, Anchorage, Ak 99508 Telephone (907) 786-4608 for a job summary, qualifications and application procedures before January 15, 1991.

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### **Natural History Internships at the Smithsonian**

Ten-week training opportunity specifically designed for undergraduate college students.

All applicants should be undergraduate students in botany, zoology or related biological disciplines. Affirmative actions principles will be used in the selection procedure. Applications are due February 1, 1991. For more information contact Mary Sangrey, 166 NHB, Smithsonian Institution, Washington, DC 20560

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of white pine in the old-growth stand. Trampling decreases regeneration, but also white pine is a species intolerant of the shade, requiring fairly open conditions for seed germination and sapling survival. New Englanders who remember the great hurricane of 1938 can attest that pastures abandoned after the storm grew back to white pine.

I have made projections about the future of the old growth pines at Hartwick State Park using a computer model of forest growth, called JABOWA, that I developed with colleagues in 1970 and has been used widely around the world since then, and that we know is realistic and accurate. Our projections suggest that the pines are reaching their maximum longevity and most of them are likely to die sometime in the next century. Without regeneration the old growth stand will cease to exist. If we want old-age white pine stands to be present for our descendants to see, then we had better begin to plan now for the next old-age stand, and actively manage areas in the park to promote white pine regeneration, by producing the right kinds of clearings on the right kinds of soils.

Hartwick Pines illustrates what we all know but so often forget: nature is dynamic, and natural ecological conditions that we seek to conserve through the Man and the Biosphere Program must be managed with an understanding of these dynamic properties. Many pieces of evidence collected during the past 20 years through ecological research make this point clear. One of the most important kinds of evidence is the history of vegetation of North America revealed by studies of pollen deposits in lakes. These show that tree species have migrated across the land in response to major climatic changes of the last ice age. Some species, such as chestnut, that we think of as part of the original, permanent forest of the Atlantic Coastal States of the United States, arrived in that region within the last 2,000 years, a short time in the history of forests.

Sometimes, what we think of as wilderness — nature undisturbed by human influence — has been altered for a very long time by people. When Peter Kalm, a Swedish botanist, visited the eastern United States in 1749–50, he wrote that the woodlands near New Brunswick, New Jersey were composed of mature oaks, hickories, and chestnuts and were so open that one could drive a horse and carriage through the forests with ease. Today, the last remaining uncut remnant of that woodland, in Huteson Memorial Forest 15 kilometers from New Brunswick, is a dense thicket of many small stems, interspersed with old oaks and hickories, but almost no regeneration of these species. Saplings are mostly of sugar and Norway maples. Fire scars visible in cut stumps of dead trees reveal that fires

burned about once a decade until 1700 — until European settlement — after which there were no more fires. The high frequency of fires prior to European settlement is generally attributed to direct actions by the American Indians. Light fires favor oaks over maples. What we have thought of as “natural” was a product of human actions.

The process of preserving Huteson Forest by fixing its condition has led to a fundamental change in its character. Once the forest was set aside and preserved, the management policy was hands off, no action, don't change the forest. Ironically, as a result the present Huteson Forest is deviating from the kind of nature the preserve was established to maintain.

Introductions of exotic species as a result of human actions are, of course, another cause of change in nature preserves. Even if you continue to believe that prior to human influence nature was unchanging, nature in the late 20th century has been so altered by our actions that it will change greatly in the future. And if global warming takes place as projected by the computer models of climate, all of our forests in North America, in fact, probably all of our nature preserves, will be subjected to drastic changes, with some of those changes beginning in the next decade or two.

As a result, those of us who desire to conserve examples of original nature find ourselves in an ironic, contradictory situation. The harder we try to achieve our goal directly — the more we try to jell nature and hold it as we think it was — the more we seem likely to fail. Something fundamental is wrong with our approach.

What is wrong with our approach was the subject of the Chairman's lecture at the annual MAB meeting in Washington, September 9, 1990. In that lecture I summarized the ideas that I discuss in my recent book *Discordant Harmonies: A New Ecology for the 21st Century* (Oxford University Press). We have been approaching the conservation of nature through a myth of constancy, a myth that nature, undisturbed by our influences, will achieve a constant condition that is its most desirable state. The reality, as revealed by many studies in ecology in the last 20 years, is that natural ecological systems are always changing, always subject to change, adapted to change, and require change. If we hope to preserve examples of nature, our management must be active and take natural dynamic qualities into account.

Another consequence of our modern understanding of ecological systems for the conservation of nature is that there is not just one kind of nature to be preserved, but at

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least three. The standard notion of wilderness in America is the idea of land untrammelled by people — a place where there is no appearance of human actions. But as Hutcheson Memorial Forest suggests, if we really remove all human actions we create a forest nobody has ever seen. Even if exotic species had not been imported into North America, Hutcheson Forest, without disturbances wrought by fire, would not look like the forest inhabited by the Native Americans prior to European colonization, nor seen by the first European explorers. As Hartwick Pines State Park warns us, forests put up on the shelf with no provisions for regeneration will not preserve the species they were set up to save.

These lessons suggest to us that we need three kinds of nature preserves: (1) areas set aside for conservation of a specific rare or endangered species or ecological community; (2) areas with the look of land as seen by the first explorers (in North America, a nature of the 17th or 18th century); and (3) areas truly isolated from direct human actions, whose purpose is not so much to conserve a mythical climax ecosystem, but to serve as a scientific experiment, a kind of ecological experimental control, a baseline against which we can view our actions in the rest of the areas that we attempt to manage for the other purposes I have described.

As we plan for the 21st century, the primary lesson for biological conservation is that nature preserves are not like strawberry preserves; they cannot be bottled, put on the shelf, and preserved indefinitely. They must be managed dynamically for specific goals. Once we have established a natural area as part of the Man and the Biosphere Program, we must seek to conserve it as a dynamic, changing entity. That is the message of the Chairman's lecture of 1990, and one of the major messages of *Discordant Harmonies*.

## **Newest Release from the UNESCO MAB Book Series**

### **Volume 5, Sustainable Development and Environmental Management of Small Islands**

edited by William Beller (of the U.S. MAB directorate on Caribbean Islands), P. d'Ayala and Philippe L. Hein. This book is composed of three parts. The first addresses issues related to islands in general. The second provides case studies of particular islands and island groups. The final part coalesces the first two into recommendations for sustainable development and environmental management of small islands in specific geographic regions.

#### **Also recently released:**

### **Volume 3, Exploiting the Tropical Rainforest, An Account of Pulpwood Logging in Papua New Guinea**

edited by D. Lamb of the Botany Department, University of Queensland, Australia. This book describes a large pulpwood logging operation in the lowland rainforests of Papua New Guinea. It examines the events leading up to the decision to begin pulpwood logging, and some of the consequences the project has had on the forests and people of Papua New Guinea.

These publications are available from The Parthenon Publishing Group, Inc., 120 Mill Road, Park Ridge, NJ 07656, USA.

## PUBLICATIONS

### Free publications from U.S. MAB:

REMEMBER, ENCLOSE YOUR SELF-ADDRESSED MAILING LABEL (OR LABELS, IF YOU ARE REQUESTING SEVERAL ITEMS).

### New from U.S. MAB:

**Bibliography on the International Network of Biosphere Reserves**, U.S. MAB Coordinating Committee for Biosphere Reserves and the UNESCO MAB Secretariat, July 1990.

### Still available from U.S. MAB:

**CONNECT UNESCO-UNEP Environmental Education Newsletter** Vol. XV, No. 1, March 1990. Environmentally Educated Teachers, The Priority of Priorities? and Vol. XV, No. 2, June 1990. Basic Concepts of Environmental Education.

**PARK SCIENCE**, National Park Service, Summer 1990 and Fall 1990 issues. A report on recent and ongoing research in parks with emphasis on its implications for planning and management. Development of new guidelines for planning and implementing resource management activities and training.

**Puerto Rico Workshop on LAND-BASED SOURCES OF MARINE POLLUTION IN THE WIDER CARIBBEAN REGION**, August 7-9, 1989, San Juan, Puerto Rico.

**Proceedings of the U.S. Man and the Biosphere-sponsored workshop on Non-Commodity Forest Resources** held at the national headquarters of the Society of American Foresters on August 24, 1989. The workshop was designed to encourage better communication between the environmental community and the USDA Forest Service regarding the need for Forest Inventory and Analysis data sets for the evaluation of noncommodity forest resources. The document contains some valuable information, and will be of assistance in the identification of additional sources of information.

### Available from others:

**TOWARDS SERVING VISITORS AND MANAGING OUR RESOURCES: Proceedings of a North American Workshop on Visitor Management in Parks and Protected Areas**, Tourism Research and Education Center, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1. Cost: \$24.95 plus \$8.60 for postage and handling.

**BIOSPHERE RESERVE Brochure/Map**. Listing and location of all (international and U.S.) biosphere reserves as of July 1989. Containing a new code to the location of all biosphere reserves. Available from: GPO Bookstore, 710 North Capitol Street, Washington, DC 20401. Tel. (202)783-3238. New Stock # 044-000-02277-0 @ \$3.00 each or \$225.00 for 100.

**Ecoregions Map of the Continents, A New Aid to Monitoring Global Change** by Robert G. Bailey. A map which shows the Earth's land areas subdivided into regions based on macroscale patterns of ecosystems. These regions delimit large areas within which local ecosystems recur throughout the region in a predictable fashion. The map can, therefore, be used to spatially extend data obtained from limited sample sites. Copies of the map are available from: Robert G. Bailey, USDA Forest Service, 3825 E. Mulberry St. Fort Collins, Colorado 80524.

**World Resources 1990-91** a complete reference book produced by the World Resources Institute on global environmental trends and conditions. It contains new findings on the rate of tropical deforestation; rankings of greenhouse gas emissions, by country; an overview of Latin America's environment; and reports and analyses of the most critical environmental and natural resource problems. This publication is available at a cost of \$17.95 plus \$3.00 for handling from WRI Publications, P.O. Box 4852, Hampden Station, Baltimore, MD 21211

**UNESCO Publication, MAB Digest 1 on Eutrophication Management Framework for the Policy-Maker** by Marjorie Holland, Walter Rast and Sven-Olof Ryding. Eutrophication of lakes and reservoirs is one of the most pervasive water quality problems worldwide. This digest aims to provide: quantitative tools for assessing the state of eutrophication of lakes and reservoirs; a framework for developing cost-effective management strategies; specific

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technical guidance and case studies for effective management of eutrophication. Available from: MAB-UNESCO, 7, place de Fontenoy, 75700 Paris.

**UNESCO Publication, MAB Digest 3 on Contributing to Sustained Resource Use in the Humid and Sub-Humid Tropics, Some Research Approaches and Insights**, by Malcolm Hadley and Kathrin Schreckenber. An overview of recent, ongoing, and planned activities within the MAB framework pertaining to the ecology of humid and sub-humid tropical ecosystems, principally forests and savannas. Available from: MAB-UNESCO, 7, place de Fontenoy, 75700 Paris.

**Final Report of the International Workshop, "Long-Term Ecological Research - A Global Perspective,"** September 18-22, 1988 in Berchtesgaden, Federal Republic of Germany. It is available from: MinR Wilfried Goerke, Dipl.-Biolge, Bundesministerium fur Umwelt, Naturschutz und Reaktorsicherheit, Godesberger Allee 90, 5300 Bonn 2, Federal Republic of Germany.

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