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SCIENCE

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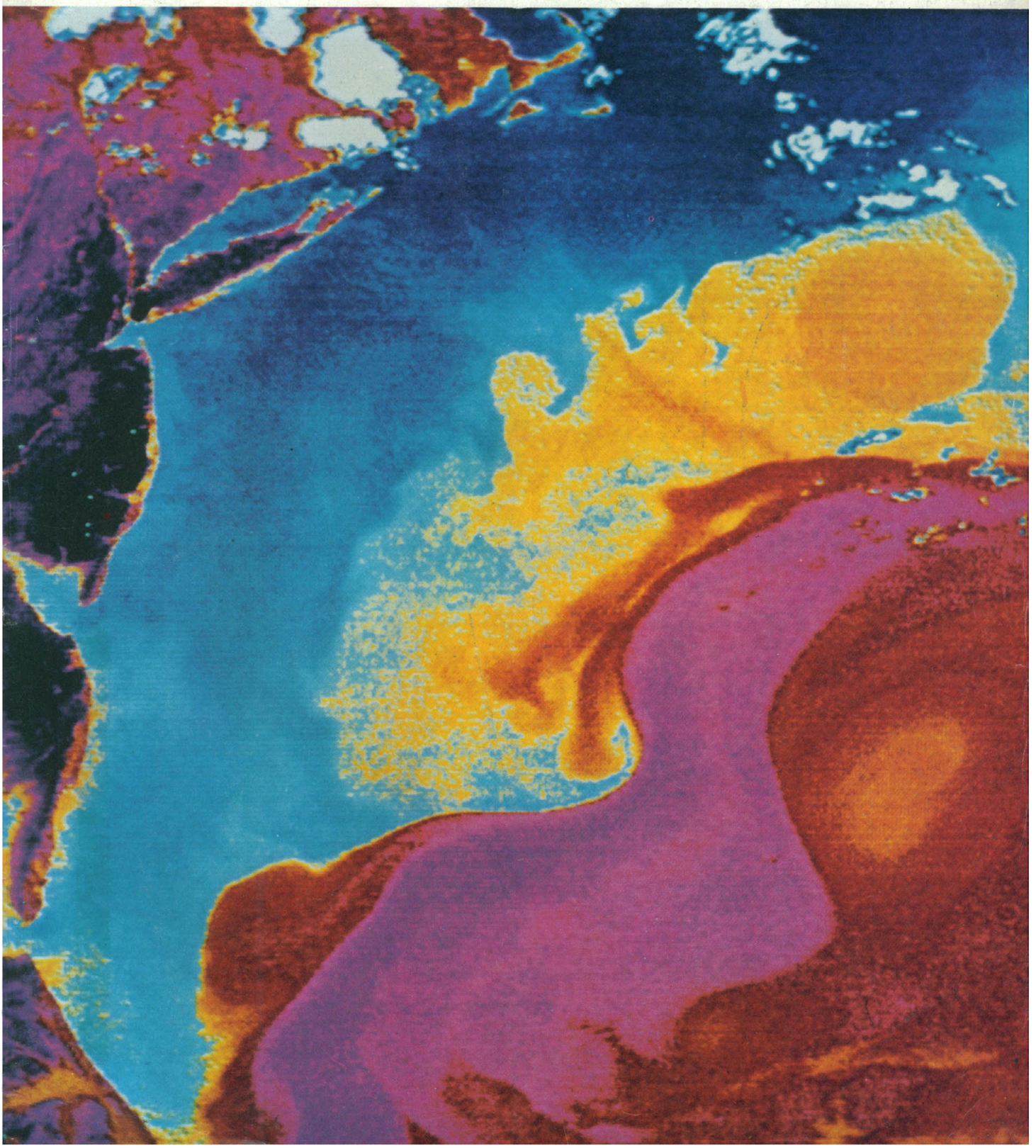

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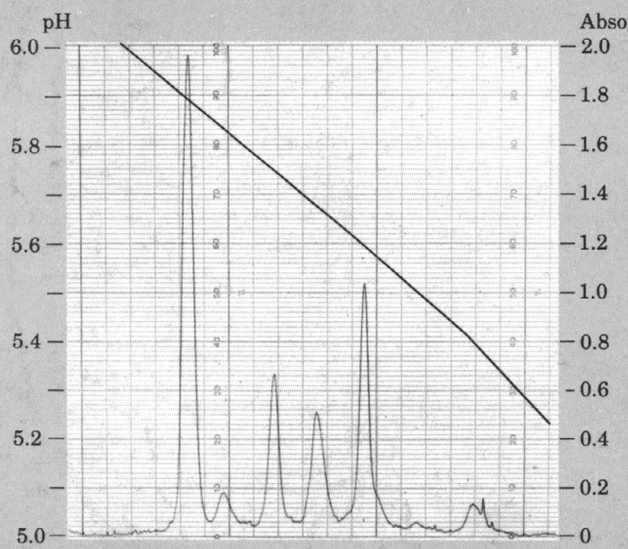

Distribution of Major Isozymes of Carbonic Anhydrase from Bovine Erythrocytes.

pI*	Percent Composition**
5.90	41.9 ± 0.5 %
5.75	17.6 ± 0.8
5.67	15.6 ± 0.6
5.60	24.9 ± 0.6

* at 10°C ** mean values based on five scans of a single sample

Laser densitometric analysis of the four major isozymes of carbonic anhydrase

There's more information to be gained than meets the eye. Looking at carbonic anhydrase on a stained electrofocusing gel will show you the four major isozymes. But it takes laser densitometry to tell you that the predominant isozyme represents 41.9% of the total. Sure, there can be problems with stains. But this analysis was valid over a concentration range covering two orders of magnitude, from 0.1 to 10.0 mg/ml. And isozymes bind with very similar staining affinities. For precision, the gel was scanned in different positions five times, automatically. It took less than six minutes, including the integration. How was it done? With the new UltroScan Laser Densitometer, from LKB – the experts in electrofocusing. Contact them today, to see what a laser can do for your gels.

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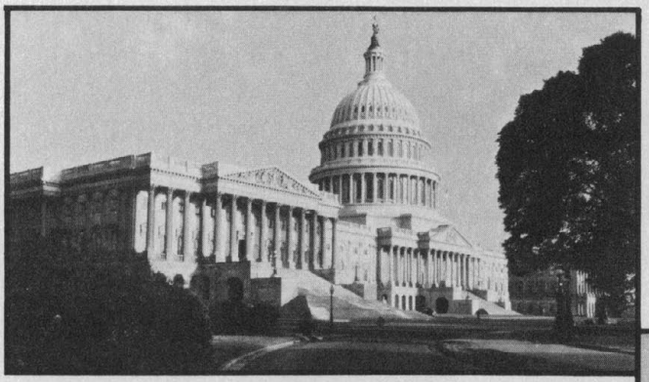
COVER

NOAA-5 color-enhanced, infrared image of the Gulf Stream on 13 April 1977 at 1400 G.M.T. A warm-core ring north of the violet Gulf Stream and a cold-core ring to the south ("Bob") appear in yellow. Colors correspond to the following temperatures in degrees Celsius: black less than 26, violet 20 to 25, red 17 to 19, orange-yellow 13 to 16, blue 3 to 12, white (clouds) less than 3. See page 1091. [Photo courtesy of Richard V. Legeckis, National Earth Satellite Service, National Oceanic and Atmospheric Administration, Rockville, Maryland]



R&D and the New National Agenda

Announcing the 6th Annual Colloquium on R&D Policy

25-26 June 1981
The Shoreham Hotel
2500 Calvert Street, NW
Washington, DC

Colloquium Topics

What will be the focus of federal R&D funding? Which programs are being cut back and which increased? What philosophical tenets underlie this set of policies? How is Congress reacting to the new administration's budget recommendations for R&D? What impacts will the new budgets have on the R&D community? Speakers and panelists will provide answers and highlight problems as they address the following topics:

- *Federal R&D* • R&D issues in the FY 1982 budget • Outlook for FY 1983 and the future • R&D policies and budgets of federal agencies
- *Defense R&D* • R&D issues in the defense budget • Current policies and program content • Trends and future projections • Alternative perspectives on defense R&D
- *Agency Perspectives* • Question and answer sessions on R&D programs and policies with officials of key federal agencies
- *R&D Outlook in the Scientific and Engineering Community* • Impacts of new R&D budgets and policies on engineering; physical, social, and biomedical sciences; science and engineering education • Short- and long-range outlook for health of U. S. science and technology

Colloquium Speakers

The Honorable James R. Jones, *Chairman, Committee on the Budget, U.S. House of Representatives;* Philip Handler, *President, National Academy of Science;* Glenn R. Schleede, *Executive Associate Director, Office of Management and Budget;* Elmer B. Staats, *President, Board of Trustees, Harry S. Truman Scholarship Foundation,* and former *Comptroller General of the United States;* The Honorable Richard DeLauer, *Under Secretary-Designate for Research and Engineering, Department of Defense;* M. Kent Wilson, *Director, Office of Planning and Resource Management, National Science Foundation;* Joseph Perpich, *Associate Director for Program Planning, National Institutes of Health*

Research and Development: AAAS Report VI, by Willis H. Shapley, Albert H. Teich, and Gail J. Breslow, will be provided in advance to colloquium registrants. The *Report* covers R&D in the federal budget for FY 1982, and other topics on R&D and public policy. Registrants will also receive the published proceedings of the conference.

For further details, call: AAAS Office of Public Sector Programs, (202) 467-4310.

6th R&D Colloquium — Washington, 25-26 June 1981

The sixth AAAS R&D Policy Colloquium will be held on Thursday and Friday, 25 and 26 June 1981, at the SHOREHAM HOTEL, 2500 Calvert St., NW, Washington, DC 20008.

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AAAS Colloquium Advance Registration—enclosed is check or purchase order for:

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Separate Meal Tickets (lunches at **$15** and dinner at **$22**):

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☐ Proc. 80 Col. ☐ Proc. 79 Col. ☐ Proc. 78 Col. ☐ Proc. 77 Col. ☐ Proc. 76 Col.

Program, badge, meal tickets, and R&D: FY 82 Report will be sent about 12 June. Registrations received after 12 June will be held at the AAAS Registration Desk at The Shoreham Hotel. Previous reports ordered will be sent as soon as possible. Proceedings of 81 Colloquium will be sent as soon as available.

Mail to: AAAS Meetings R&D, 1776 Massachusetts Ave., NW, Washington, DC 20036

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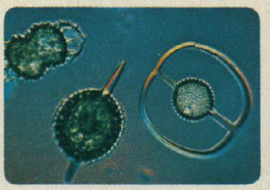

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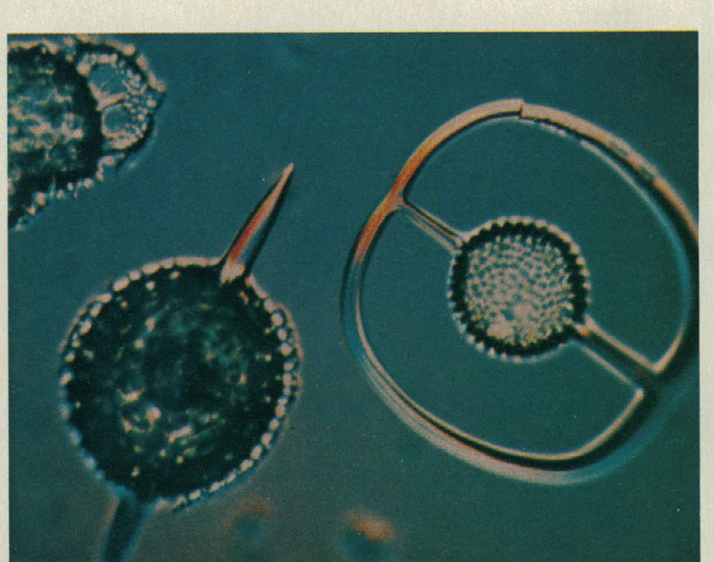

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community colleges and 4-year colleges will bear more and more responsibility in the coming years for science education because of inflation and prohibitive tuition costs at larger universities. If this trend is to continue, we will need more, not less, of Chautauqua-type programs to help the faculty in these colleges keep in touch with different branches of science.

The cuts proposed by the Office of Management and Budget for all science education programs are "jellybeans" compared to the waste in so many other federal programs. I hope that the scientific community, especially those working in small colleges, will band together and lobby for the restoration of the cuts.

K. V. NATARAJAN
Greater Hartford Community College, Hartford, Connecticut 06105

Chlorinated Drinking Water

The Environmental Protection Agency (EPA), the Council on Environmental Quality (CEQ), and now Thomas H. Maugh II (Research News, 13 Feb., p. 694) suggest that we face an imminent danger of cancer from chloroform in our drinking water. Before we are forced to spend tens of billions of dollars for its removal, someone should ask whether these estimates of risk are based on reason or on Environmentalist theology.

It is reported to be possible to produce cancer in rats and mice with carefully selected doses of chloroform, but apparently not without severe liver or kidney damage. On this basis, it is fair to consider that chloroform might be a human carcinogen. It is not appropriate to conclude that it is such and to refuse to consider evidence to the contrary. Quite a lot has been learned about the physiological effects of chloroform since it was discovered 150 years ago or first used as a human anesthetic 134 years ago. I have not reviewed the original literature, but the available reference sources indicate that: (i) attempts to produce cancer in experimental animals other than rodents have been unsuccessful; (ii) its use as an anesthetic has been abandoned largely because newer agents offer a lower risk of cardiac failure; and (iii) occupational exposure limits have been reduced several times because of concern for liver damage and related effects. These human exposures have been in the range of 0.1 to 10 grams *per day*. The exposure expected from drinking water is 0.1 to 10 grams *per lifetime*. Unless a very large

increase in cancer has been overlooked or unless the usual assumption of linear dose-effect relationship is seriously in error, the number of excess cancers from chloroform in water must be zero for the most probable case. For the worst possible case, it would still be less than the number of excess deaths from building and operating the suggested treatment facilities.

Several statistical studies reviewed in a recent CEQ report claim a 13 to 93 percent increase in certain types of cancer to be associated with water chlorination, which produces chloroform. Maugh implies that this is evidence for cause and effect. The decision to chlorinate a water supply is so closely related to other demographic variables (for example, urban or rural location) which have been separately correlated with cancer rates that a whole army of statisticians working for years could not tell us with any confidence whether an effect this small is or is not simply an artifact. Even if there were a strong, clear association, we would not know whether the water was hazardous because it was chlorinated or chlorinated because it was hazardous.

Science is so quick to suggest bias when a professor supports some of his graduate students on industrial grants that I am surprised Maugh fails to remark on the members of the Carter CEQ. Robert Harris has stated his prejudices quite clearly. Gus Speth, former executive for the Natural Resources Defense Council, should not be blamed for the advocacy of his associates, but neither would he be selected as a model of impartiality.

It has taken the EPA only 10 years to discover that outside air, for all of its troubles, is generally much cleaner than indoor air. How long will it take them to notice that tap water turns black when someone disturbs the pipes of a system treated by absorption with regenerated carbon, and what remedy will they suggest if someone observes that these fine carbon particles contain a high concentration of polycyclic aromatic hydrocarbons?

CLARE A. STEWART, JR.
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Wilmington, Delaware 19803

Erratum: The correct address of Lawrence Erlbaum Associates, the publisher of *The Nature of Thought*, which was reviewed in the issue of 1 May, p. 536, is Hillsdale, N.J.

Erratum: The correct surname of the editor of *Physics of Magmatic Processes*, which was reviewed in the issue of 8 May, p. 656, is Hargraves.

Erratum: Anthropologist Louis Dupree ("Afghanistan: The politics of a tragicomedy," News and Comment, 1 May, p. 521), a member of the American Universities Field Staff, is also associated with the Pennsylvania State University, not with the University of Pennsylvania, as stated.

The Second Annual International Congress For

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of the
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Published by Mary Ann Liebert Inc., Publishers, New York, New York.

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5 June 1981, Volume 212, Number 4499 **SCIENCE**

U.N. Conference on New and Renewable Energy

The United Nations Conference on New and Renewable Sources of Energy, to be held 10 to 21 August in Nairobi, offers an opportunity for global cooperation in confronting energy problems. Its scope is a product of U.N. politics: petroleum, nuclear power, and conservation were considered too hot to handle by one or another political group. Thus the conference will focus on the full range of renewable energy sources, together with geothermal energy, shale oil, and tar sands. This scope, if not logical, has its advantages: these sources are not yet so encrusted by political and economic interests as to render cooperative international discussion impossible. Moreover, the Secretary-General of the conference, Enrique Iglesias (head of the U.N. Economic Commission for Latin America), has stressed the need to view renewables within broader energy and development contexts, in which conventional sources and conservation also have their proper roles.

Background technical preparations are now complete. International expert groups have reported on the status and prospects of each major technology, while other groups have analyzed such cross-cutting issues as technology transfer, R & D, education and training, and finance. Although the work of these groups was uneven, the results have been synthesized into general reports that provide a sound basis for conference deliberations. The preparatory process has so far been remarkably free of the usual U.N. polemics. While this holiday may end as the conference date approaches and senior politicians take over national delegations, it does appear that governments, facing desperate energy plights, have been loath to jeopardize a process that might produce tangible benefits.

The main problem to date has not been an excess of sterile ideological debate, but a paucity of ideas for actions that would do more good than harm in the field of renewable energy. The conference process is helping to legitimize renewables, especially in wary developing countries, much as the 1972 Stockholm Conference did for environmental concerns. But, beyond this intangible educational function, what actions by the U.N. could serve the cause? All involved seem to realize that energy problems must be tackled primarily at the national and local levels but that international cooperation and assistance to poorer countries are crucial as well.

Many promising ideas are under discussion. For example, the conference could encourage every nation to undertake a comprehensive assessment of its energy resources, needs, and alternatives in order to put energy planning and the promotion of renewables on a solid footing. It could set up mechanisms for improved international coordination of R & D on new and renewable energy and for the easier exchange of technical information. Assistance that helps build the capacities of poorer countries to develop, adapt, and produce technologies suited to their needs can be pursued. One of the most valuable results of the conference could be a global action plan to meet the crisis of dwindling supplies of firewood, the principal cooking fuel of the world's poor.

Secretary-General Iglesias has avoided calling for grandiose institutions or funds that the rich countries would be in no mood to bankroll. Still, new technical assistance and coordination activities by the U.N. will require modest sums and people to manage them. More broadly, capital assistance for economically justified renewable energy investments in the poor countries, such as that provided by the World Bank, needs to rise. Clearly, greater support for energy progress in developing countries is required from Western donors and oil-exporting countries alike.

The United States has long urged the U.N. to focus on specific, practical matters and to avoid the proliferation of institutions and special funds. Such realism has characterized preparations for the Nairobi Conference and a productive meeting seems possible.—ERIK ECKHOLM, *International Institute for Environment and Development, 1302 18th Street, NW, Washington, D.C. 20036*

The 1981 Rolex Awards For Outstanding Enterprise

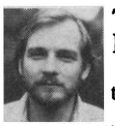
The Rolex Awards for Enterprise is an international program to provide financial help and special encouragement for individuals whose projects have broken new ground in their chosen fields. These projects capture that spirit of enterprise which has been such a characteristic of the development of the Rolex watch. Here are the five award winners of 1981 with a resume of their projects.

A Blueprint for Disarmament — Seymour Melman

If global disarmament ever is to be achieved, one vital step in the process will be to convert industrial economics from military to civilian work. Seymour Melman, an American Professor of Industrial Engineering, has been exploring myriad technical, economic and organizational changes required to make such conversions work.

As industrial economics vary widely, Professor Melman is formulating three representative models for conversion: the U.S.A. and Western Europe, the Socialist countries, and the less-developed countries.

His 1981 Rolex Award for Enterprise will enable Professor Melman to develop his blueprints for conversion.



To Save the Snow Leopard — Rodney Jackson

In the snow-covered Nepalese Himalayas lives the elusive, endangered snow leopard.

Mr. Rodney Jackson, a wildlife biologist, plans to capture live several specimens of these magnificent creatures and collar them with radio transmitters. Very little is known about the snow leopard, but we do know that it faces almost certain extinction as man encroaches upon its habitat.

Mr. Jackson's 1981 Rolex Award for Enterprise will expand our knowledge of the snow leopard and its environment and help save a beautiful species from extinction.

Preserving Mexican Folk Music — Eduardo Llerenas

The culture of Mexican folk music is one of the richest in the world.

However, due to the influence of TV, radio and the record player, it is a culture fast disappearing.

With two companions, Mr. Eduardo Llerenas has made over eighty trips into the remotest parts of Mexico in order to record, compare and preserve the country's traditional songs.

When completed, the work of Mr. Llerenas will provide an accurate and lively record of the folk music of Mexico.

His 1981 Rolex Award for Enterprise will help Mr. Llerenas to complete this valuable undertaking.

Re-fertilizing the Earth — Andre Martin

All over the world, vast tracts of fire-damaged land lie waste. To return land such as this to its original fertility is the aim Andre Martin has set himself. The undergrowth, brushwood and scrub, the only things which will grow on such land, are cleared and converted into an organically rich compost.

In a successful experiment in France, twenty previously desolate acres have been returned to successful cultivation using this method.

His 1981 Rolex Award for Enterprise is reward for Andre Martin's truly fertile imagination.

Let the Sperm Whale Live — Milan Mirkovic

Mr. Milan Mirkovic has devised a novel irrigation method for the growing of the jojoba bush. The jojoba nut contains an oil which is almost identical in properties to sperm whale oil and therefore could become a commercial alternative to sperm whale slaughter.

However, it is only Mr. Mirkovic's use of containers filled with earth and a water absorbent polymer (it holds 1,000 times its own weight of water, thus dramatically reducing the cost of irrigation) which may make the cultivation of the jojoba a commercial possibility. Mr. Mirkovic's 1981 Rolex Award for Enterprise should help in saving the sperm whale.

Each of these five winners has received 50,000 Swiss francs as a contribution to the fulfillment of his work. Each has also received a specially inscribed Rolex Oyster as a tribute.

The 1981 Rolex Awards for Enterprise: Help and encouragement to those who have demonstrated truly outstanding enterprise.

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