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**SCIENCE & TECHNOLOGY**


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Apart from the technical challenges of discovering and isolating new microbes, scientists in the field have faced critical logistical difficulties—getting news of recent microbe finds and locating reserves of valuable strains. But a new program at the United Nations has been coming to their aid, helping to shape the direction of new research in the process, reports DaSilva, of the UN Educational, Scientific, and Cultural Organization (UNESCO).

In the past eight years, UNESCO, the UN Environment Program, and the UNESCO-related International Cell Research Organization have opened Microbiological Resource Centers in Australia, Thailand, Sweden, Kenya, and Brazil. By monitoring worldwide research and keeping records of discoveries, these institutes are starting to serve as reference centers for microbe specialists. They can help experts find and obtain strains they need, and identify projects and experiments that could benefit from microbe supplies on file. (Tens of thousands of microbe strains are catalogued in the system's directory.) They also train new microbe specialists from developing countries and promote new applications of microbiology—such as water purification, conversion of garbage to methane fuel, and even the microbial manufacture of solar energy.

The UN microbe centers are particularly interested in using microbes to aid agriculture and industry in the Third World. Microbes able to convert carbon dioxide into protein could combat hunger. And UN economists view microbial methane production as precisely the kind of low-technology industry that developing countries need to promote lasting and equitable growth.

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### *Early Man's Climate Changes*

"Anthropogenic Albedo Changes and the Earth's Climate" by Carl Sagan, Owen B. Toon, and James B. Pollack, in *Science* (Dec. 21, 1979), 1515 Massachusetts Ave. N.W., Washington, D.C. 20005.

Long before the advent of modern industry and technology, man had drastically modified the Earth's surface. Sagan, a Cornell astronomer, and Toon and Pollack, NASA research scientists, note that the major manmade changes have coincided with climate shifts, and suggest that the two phenomena are linked.

Roughly 15 percent of the Earth's surface has been changed by man. Twenty thousand years ago, the use of fire had already greatly changed world vegetation patterns. In the 16th century, Spain's explorer Ferdinand Magellan saw just how this could happen. When he rounded Cape Horn, he noticed so many fires set by South American Indians

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that he named the region Tierra del Fuego.

In India's Rajasthan desert, overgrazing destroyed vegetation and reduced rainfall by sending vast clouds of dust into the atmosphere, starting around 2000 B.C. In West Africa's Sahel, experts trace the region's weak plant life to both overgrazing and slash-and-burn agriculture centuries ago. "Killer droughts" such as occurred in 1973-74 were probably a recurring result.

Humans have cleared 7 million square kilometers of tropical forest alone, equivalent to half the Earth's present jungle area. Forty percent of the rain forests of Africa and Brazil have been destroyed. (Today, between 50,000 and 250,000 square kilometers of tropical forests are being cleared annually, mainly to increase croplands.) Most of the temperate forests in China and the Mediterranean basin were destroyed by A.D. 500; some 8 million square kilometers of such forests were cleared in Europe and North America in 1400-1900. The authors suggest that deforestation triggered the mild Little Ice Age that affected the world from A.D. 1200 to 1900. During this period, glaciers advanced, and the Earth's mean temperature stood 0.5° C lower than it does today.

The more barren the Earth's surface, the higher its *albedo*—its ability to reflect sunlight. The more sunlight the Earth reflects, the cooler it gets. Rainfall slacks off, too. The authors speculate that this albedo-related cooling is counteracting the warming "greenhouse" effect on the planet caused by the heat-trapping pollution from fossil fuels.

### *Iron Curtain Nuclear Protests*

"The Soviet Syndrome" by Alexander Motyl and Adrian Karatnycky, in *The New Leader* (Dec. 3, 1979), 212 Fifth Ave., New York, N.Y. 10010.

Grassroots opposition to atomic plants has spread from the West to the East. Nuclear development throughout the Soviet bloc has aroused concern and even public protest behind the Iron Curtain, say Eastern Europe specialists Motyl and Karatnycky.

Last year, in Czechoslovakia, a group of dissident energy experts complained publicly of inadequate safety measures and excessive secrecy surrounding their government's nuclear programs. The Yugoslavs have gone further; demonstrations in the town of Zadar in 1978 forced cancellation of a proposed nuclear power plant on the Dalmatian coast.

Soviet worries about nuclear accidents are also apparent, if muted. A recent Russian feature film, unobtrusively titled *The Investigation Commission*, deals with a breakdown at a Soviet nuclear plant. Though the communist media usually play up Western failures, *Izvestia* and other news organs have soft-pedalled last spring's events at Three Mile Island, Pa.

The Soviet Union has 27 nuclear reactors, East Germany 4, Czechoslovakia and Bulgaria 2 apiece; Hungary will soon build its first. Rumania has just bought two nuclear plants from Canada. Already