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EPA JOURNAL

Taking a
Global View





The rugged Portuguese coast. The seeming timelessness of surf and shore make it difficult to realize how vulnerable our planet is, and how fragile is the ecosystem that faces daily insults from a wide range of environmental problems.

Taking a Global View

Depletion of stratospheric ozone...a pollution disaster on the Rhine River...a nuclear accident at Chernobyl. The news is filled with reminders that this is a vulnerable planet. This issue of EPA Journal takes a global view, with articles on whether we should feel grim or hopeful about our long-range environmental future.

EPA Administrator Lee M. Thomas leads off the issue, giving his views on whether it is realistic to hope for an environmentally healthy planet. Fitzhugh Green follows with an article describing EPA's wide-ranging work with other countries on environmental problems. Green has been EPA's Associate Administrator for

International Activities, serving in the position for a total of nearly 11 years.

The next three articles illustrate how some seemingly overwhelming environmental problems that transcend many nations' boundaries are being addressed. In one piece, Mostafa Tolba, Executive Director of the U.N. Environment Programme, spells out a plan to deal with pollution emergencies such as last year's huge spill of industrial chemicals into the Rhine River. Another article reports on encouraging progress in facing two awesomely complex problems: depletion of the planet's ozone layer and the ravages of El Niño, a climate-affecting phenomenon originating in the Southern Hemisphere.

The third article explains actions that could help stem the loss of one of the Earth's greatest resources, its tropical forests.

The next two articles report changes in attitudes that can help lay the groundwork for more planet-conscious decision-making. One piece chronicles the emergence of grass-roots environmentalism from Indonesia to Brazil. The second feature reports on the recent decision by a major global financial organization, the World Bank, to give environmental protection a higher priority. Another article presents an industry viewpoint on the question of whether there should be uniform global environmental standards.

The next article is based on a major report by the World Commission on Environment and Development. The article presents excerpts from this sobering study of the seriousness of mankind's

threats to the planet's well-being, and in a separate piece, former EPA Administrator, William D. Ruckelshaus, a member of the Commission, comments on the report. United States government reaction is also included.

The final article on the international theme is a report from the U.S. Agency for International Development on how it is using its aid dollars to support the integrity of the environment from Costa Rica to Madagascar.

Two non-theme articles include a report on EPA's role in case of nuclear power plant accidents and an explanation of the Agency's air emissions trading policy.

The issue concludes with a regular feature, Update. □

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EPA is charged by Congress to protect the nation's land, air, and water systems. Under a mandate of national environmental laws, the agency strives to formulate and implement actions which lead to a compatible balance between human activities and the ability of natural systems to support and nurture life.

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Front Cover: Bathing in the Ganges River in India. EPA is helping with environmental efforts to protect this famous river. See article on page 4. Photo by Johangin Gazdar, Woodfin Camp & Associates.

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Editor's note: We would like to give credit to Jack Kelley of the Citizens Voice, a Wilkes-Barre, PA, newspaper, for the photograph on page 22 of the June issue of the *EPA Journal* illustrating the Agency's work in researching a gastroenteritis outbreak in Pennsylvania.

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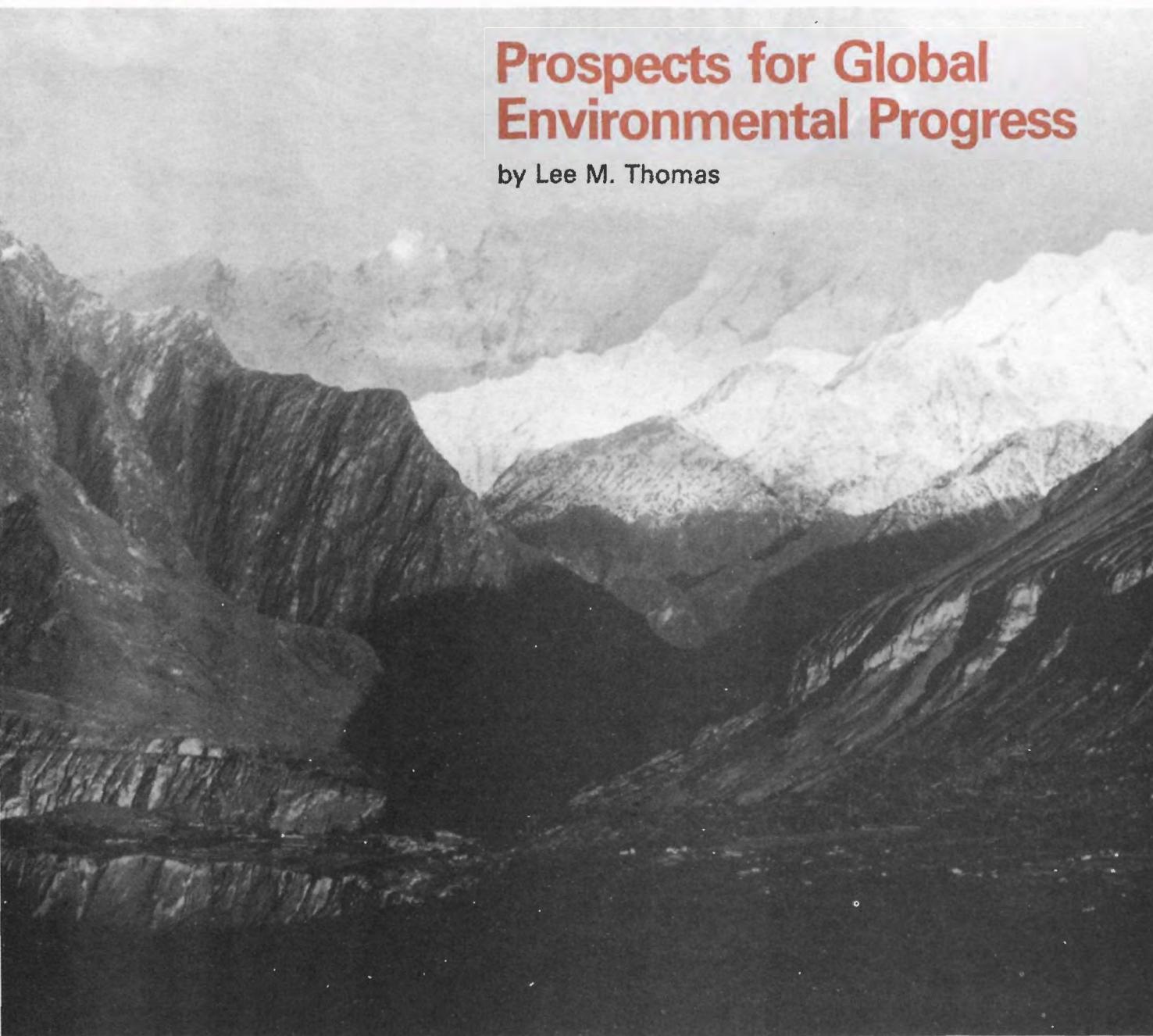
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Prospects for Global Environmental Progress

by Lee M. Thomas

Chris Bonington (Daily Telegraph), Woodfin Camp & Associates

A view of the Valley of Hunzas in the Himalayas, crowned by sunlight and shrouded in shadow: "...environmentalism on a global scale has evolved to the point where its momentum appears irreversible."

Fifteen years have passed since 113 governments agreed in Stockholm, Sweden, to cooperate in attacking a new threat to human welfare: the degradation of the global ecosystem from environmental pollution, over-population, and mismanagement of the natural resource base. We have come a long way since then in our awareness of how human and biological systems interlock, and we have a far more sophisticated grasp of what must be done.

Is the goal of an environmentally healthy world realistic? To answer that question, one has only to examine the extent and significance of what has been accomplished to date. Governments have responded to the environmental

challenge at national, regional, and global levels with a broad spectrum of institutional and programmatic initiatives. Indeed, despite many false starts, setbacks, continuing constraints, and the emergence of new hazards, the spirit of international cooperation has steadily grown stronger.

In short, the community of nations is slowly maturing. We have all suffered a loss of innocence about "Earth management." *Laissez-faire* may be good economics, but it can be a prescription for disaster in ecology. Only decisive mutual action can secure the kind of world we seek.

This coming of age is reflected in the broadening of intellectual perspective. Governments used to be preoccupied

with domestic environmental affairs. Now they have broadened their scope to confront problems that cross international borders (e.g., transboundary air and water pollution), and threats of a planetary nature such as stratospheric ozone depletion and climatic warming.

Much of the ambitious and successful planning for new institutions, programs, and regulations was carried out in the 1970s during a period of relative worldwide prosperity. It was inevitable that this low-cost planning phase would evolve into a period of implementation and a time of major investments in facilities, equipment, and capital projects.

Unfortunately, just as the environmental community was ready to take action, the world economy began to falter. The old "conflict" between development and eco-investments again reared its head. These unanticipated constraints, however, tightened project selection criteria, forced program consolidation, and cut into marginal and overlapping activities at both national and international levels. In-house assessment and planning had to improve quickly.

The result is a more adaptable, rational, and integrated network of institutions, and a more efficient approach to environmental programming. Member governments of international bodies are today making more deliberate and coordinated decisions on program priorities and the organizations that can best pursue them. That the international environmental community has been able to adjust to such resource fluctuations is a measure of its strength, permanence, and maturity.

Still, transboundary pollution is a growing challenge. Air pollutants do not honor national boundaries, and conflicts over water rights between upstream and downstream neighbors engender opposition to the very concept of mutual assessment and information exchange. But ignoring the potential in cooperation is counter-productive, and delays merely aggravate underlying problems.

The international community is intensely aware of the special plight of Third World states as they struggle desperately against population growth, a deteriorating national resource base, and declining commodity markets to keep living standards from falling any faster. Our collective failure to even approach the aspirations voiced on behalf of the

developing world at Stockholm has been disappointing. If there is any good news, it is in the new commitment of developing states to environmental goals. The concept of "sustainable development," especially as recently endorsed and elaborated by the World Commission on Environment and Development in their report, *Our Common Future*, can serve as a unifying theme and rationale for future efforts to integrate environmental practices into the development process. Neither can long prevail without the other.

Indeed, environmentalism on a global scale has evolved to the point where its momentum appears irreversible. The

With an entire planet at stake, it's hard to believe we won't rise to the occasion.

world community has developed an arsenal of tools that has been tested repeatedly in the field and is today much more sharply targeted, including international planning conventions and bilateral-multilateral agreements covering a panoply of pollution, population, and resource issues.

In addition, there is now in place a network of multilateral environmental organizations that have a much clearer sense of their roles, greater incentive to work together, and a burgeoning record of achievement. These include the United Nations Environment Programme (UNEP), the body created after Stockholm to serve as an environmental conscience and coordinator within the UN family; the Environment Committee of the Organization for Economic Cooperation and Development; and the Senior Advisors on Environmental Problems of the Economic Commission for Europe. Such institutions perform unique functions that cannot be carried out by governments acting alone or bilaterally.

Of great practical importance is the emergence of environmental consciousness among multilateral development banks, including the World Bank and the various regional banks. Whereas most attention in the 1970s was focused on environmental policies and programs of bilateral assistance agencies, now the emphasis has shifted to the multilateral lending institutions that provide the bulk of external support to Third World nations for large-scale projects.

Finally, there is no better reflection of the coming of age of international

environmental cooperation than the expanded participation of the private-sector and nongovernmental organizations. It is now clear to everyone that only by consolidating the intellectual and financial resources of the public and private sectors can we hope to maintain the global ecosystem so it can meet a variety of social needs over the long term.

There is a new and welcome perception that industry should be perceived as part of the solution and not just a problem. The World Industry Conference on Environmental Management, jointly sponsored by industry and UNEP in 1985, contributed very strongly to a new climate for cooperation among different sectors. It illustrates the type of initiatives that multilateral and multinational entities are well-suited to undertake if they exercise their collective imagination.

This special issue of *EPA Journal* recognizes the importance of our natural heritage to all Americans, and acknowledges the considerable efforts underway to preserve and enhance it. This country remains a leader in providing international technical and financial assistance. U.S. experience and technology continue to be widely sought by others, and our policies, programs, and regulations are often studied and adapted.

Our unflagging commitment is in the national interest, since it is obvious that all societies are vulnerable to pollution as well as to cumulative impacts on global oceanic, hydrological, and climatological systems. It recognizes the unique benefits of international program cooperation, sharing of data, and mutual resource investments, thus cultivating conditions for peace and prosperity. It demonstrates a historic new willingness by the American public to adopt a planetary world-view.

Our national experience teaches us that societies can "overcome" through creative thinking, mobilization of resources, and broad cooperation. We now have at our disposal an unprecedented array of institutions, dedicated specialists, and technologies to do the job. Our track record isn't bad, and we're primed for the future. The ecological payoff in the decades ahead will justify any short-term sacrifices we may have to make. With an entire planet at stake, it's hard to believe we won't rise to the occasion. The response we give will determine our place and reputation in world history. □

(Thomas is Administrator of EPA.)

EPA's Work Internationally

by Fitzhugh Green

Even in its first years, visitors from all over the world came to EPA to learn what we were doing, and this interest has grown along with the scope of EPA's activities. Indeed, the breadth of EPA's overseas activities is remarkable, including negotiating international environmental treaties, maintaining liaison with other health and environment organizations, and cooperating with and encouraging the environmental initiatives of other nations, particularly Third World countries. In addition, the Agency works to spare U.S. industry from unfair

foreign competitors benefiting from pollution havens.

This worldwide scope does not imply a lack of interest closer to home, however. In the past 10 years, the United States has significantly improved environmental ties with our two closest neighbors, Canada and Mexico.

Acid rain, for example, is an environmental issue that looms particularly large in our relations with



Canada, despite U.S. expenditures of more than \$200 billion since 1970 to control air pollution. These expenditures have resulted in a significant decline in emissions of the sulfur oxides linked with acid rain, while the rate of growth of nitrogen oxide emissions has slowed to almost zero. While acknowledging the problem of acid rain and its importance to both of our countries, EPA's Administrator, Lee M. Thomas, questions the validity of certain Canadian assumptions and data interpretations on acid rain.

Nevertheless, consistent with our desire to maintain good relations with a close friend and ally, President Reagan appointed a special envoy to study the issue. In January 1986, the U.S. and Canadian envoys released their report recommending a five-year, \$5 billion program. Two months later, at his second summit with Canadian Prime Minister Brian Mulroney, President Reagan approved the envoys' report; in April 1987, he announced his intentions to fully implement the recommendations of the special envoys, building on existing technology demonstration programs at the U.S. Department of Energy and EPA. At the spring summit this year, President Reagan also proposed consideration of a bilateral accord on acid rain.

Another bilateral achievement between the United States and Canada is their joint implementation of the Niagara River Toxics Management Plan. The severely polluted Niagara River, which feeds directly into the famous falls at the U.S.-Canadian border, has long been a sore point. Ecologists from both Canada and the U.S., as well as Canadian officials, have accused the United States of subjecting one of the world's natural wonders to grievous harm by governmental inaction. But on February 4, 1987, officials of the U.S., Canada, New York State, and Ontario Province signed a Declaration of Intent in which they agreed to coordinate all of their existing activities, establish a common basis for assessing toxic chemical loadings to the river, and identify priorities for future control measures.

One of the world's natural wonders—Niagara Falls—is being tainted by toxic chemicals feeding into it from the severely polluted Niagara River. In February 1987, U.S. and Canadian officials signed an agreement to coordinate their cleanup activities aimed at restoring the river and falls.

Restoring the Niagara River and Niagara Falls, however, will also require joint efforts to protect the Great Lakes. Canadian and U.S. officials are now reviewing the Great Lakes Water Quality Agreement of 1978 with the intent of strengthening and updating it with the most recent scientific evidence. The provisions of the new agreement will be announced at a formal signing later this year.

South of the border, the United States and Mexico have also made significant strides to correct common

The environment provides a vehicle for East/West meeting of the minds, despite ideological and economic differences.

environmental weaknesses. The U.S.-Mexico Agreement, signed in August 1983 by Presidents Reagan and De la Madrid, has put collaboration between the two countries on a new footing. Before 1983, environmental border problems were handled on an ad hoc basis by U.S. and Mexican Commissioners of the International Boundary and Water Commission, as well as through agency-to-agency arrangements. Now, with the federal governments of these two republics cooperating more directly, there has been substantial progress in a number of areas:

- Mexico has redirected and/or treated flows of raw sewage into the United States from burgeoning Mexican border cities, particularly Tijuana.
 - U.S. and Mexican emergency response personnel are now preparing a joint plan to deal with accidental spills of hazardous substances that may occur within 100 kilometers on either side of the Rio Grande.
 - Strict controls have been imposed on transboundary movement of hazardous waste and hazardous substances across the U.S.-Mexican border.
 - Three large copper smelters, responsible for huge quantities of toxic pollution in the border area, have been either shut down or compelled to meet stringent emission standards.
- The fact that this progress is being achieved during a period of economic hardship in Mexico reflects a major commitment by that government to international environmental cooperation.

The Administrator is also proud of cooperative activities underway elsewhere in the Western Hemisphere. For example, in association with the World Wildlife Fund and the Conservation Foundation, EPA has helped Brazilian authorities control a critical air pollution problem in the state of São Paulo. Industrial air pollution there has so devastated a tropical forest that it can no longer prevent severe landslides on the slopes of the Serra Do Mar mountain range. The state of São Paulo secured a World Bank loan earmarked to subsidize the installation of much-needed pollution-control equipment, with EPA providing continuing technical assistance in connection with that loan.

EPA also collaborates with the Pan American Health Organization (PAHO), a regional arm of the U.N.'s World Health Organization (WHO), on problems of pesticide management, drinking water, and toxicology. Especially important is an ongoing health and risk assessment effort that involves training and workshops, translation into Spanish of EPA material, and studies of the health effects of certain substances in selected populations (e.g., lead exposure in Argentine children).

Worldwide, the Agency shares with WHO a variety of experts and research facilities and has been designated a "Collaborating Center for Environmental Pollution Control." This designation integrates EPA into many of WHO's technical programs related to health protection in both advanced and developing countries. One of the most prominent is WHO's U.N. International Programme on Chemical Safety (IPCS), which is co-sponsored by the United Nations Environment Programme (UNEP) and the International Labor Organization. The Administrator strongly supports this effort to produce environmental health criteria documents, as well as health and safety guidelines on a whole range of toxic chemicals. UNEP also seeks better methods for testing the toxicity of chemicals and serves as a key forum on chemical accident prevention and response.

One of UNEP's most important international achievements is the landmark agreement to protect the Earth's ozone layer. Signed in March 1985 by the United States and 30 other nations, this agreement represents the

first time that the nations of the world have joined forces to address an environmental problem before it actually produces measurable effects on mankind. Despite scientific uncertainties, the signatories acted in response to growing concern that continued emission into the atmosphere of certain man-made chemicals could significantly deplete the Earth's protective ozone layer, with resulting increases in skin cancers, including fatal melanomas, higher incidence of cataracts, and disruption of unknown magnitude in crop yields and aquatic ecosystems.

The chemicals most often linked to stratospheric ozone depletion are chlorofluorocarbons (CFCs), man-made compounds used in aerosol propellants, for refrigeration, and in insulation. EPA has banned their use in aerosols since 1978, but other uses persist, both here and abroad, including aerosol use in some countries. Although the 31

protocol to be "the most significant environmental act undertaken within the past 10 years."

Other UNEP activities of EPA interest have included the development of international rules on the transboundary shipment of hazardous wastes, the formulation of procedures for writing environmental impact assessments, and the creation of several regional-level agreements to protect marine environments in different regions of the world (for example, the recently promulgated environmental conventions for the Caribbean and the South Pacific).

UNEP is not the only forum for EPA's international environmental efforts. Another is the Committee on the Challenges of Modern Society (CCMS), sponsored since 1969 by the North Atlantic Treaty Organization (NATO). NATO member countries act as leaders for particular pilot projects with emphasis placed on projects that can guide policy formulation and

a chance to compare problems, frustrations, and successes. A subject recommended by the Administrator—indoor air pollution—will be the topic of the 1987 CCMS Round Table scheduled for this fall.

Also prominent among multilateral institutions is the Organization for Economic Cooperation and Development (OECD). The OECD includes the industrial nations of the West, plus Japan. Over the past 15 years, it has become increasingly active in the environmental field.

The OECD sponsors a substantial number of policy and technical efforts in which EPA is a key player. OECD projects are designed to integrate environmental protection objectives with considerations of economic costs, benefits, and trade.

High priority OECD programs for the U.S. focus on chemicals and environmental protection; development of an international system for hazardous waste shipments; regional modeling on the formation and transport of photochemical oxidants; improved methods for assessing the benefits of environmental regulations; and standardized environmental data collection and reporting.

New initiatives have included a ground-water protection project that aims at the integration of agricultural and environmental policies; a plan to improve chemical accident prevention and emergency response; methods to help developing countries tackle environmental problems; and review of mobile source pollution controls.

Another area of major multilateral cooperation is the global marine environment. With the International Maritime Organization (IMO) in London, EPA helps to develop and implement international rules to protect the oceans from dumping, tanker spills, and incineration of hazardous chemicals. Officials of EPA, the National Oceanographic and Atmospheric Administration, and the Coast Guard have also helped to forge new international regulations to reduce pollution from garbage and plastics.

EPA often benefits from bilateral cooperation with industrialized nations on shared problems. EPA administrators, engineers, scientists, and lawyers exchange information with their foreign colleagues and pursue joint projects that enhance the Agency's capability for its domestic duties. Programs with the Federal Republic of

Dick Kamp, Border Ecology Project



The Mexicana de Cobre smelter in Nacozi, Mexico, some 55 miles south of the U.S.-Mexico border. On January 29, 1987, the United States and Mexico signed an agreement to control pollution from copper smelters along their borders.

signatories in 1985 could not reach a consensus on actual measures for controlling the growth of CFCs and other ozone-depleting chemicals, two years of further international consultation, analysis, and negotiation under UNEP's auspices have led to a new protocol. Due to be signed this month in Montreal, the protocol will add regulatory "teeth" to the 1985 agreement.

The Administrator has long been convinced of the seriousness of the ozone problem and of the need for international action. In fact, he considers the prospect of regulatory measures being incorporated into the

implementation in member countries, as well as foster cooperation among them.

CCMS pilot studies have probed health, the environment, and the preservation of our cultural heritage, including such topics as air pollution, advanced wastewater treatment, drinking water, contaminated land, inland water pollution, utilization and disposal of municipal sewage sludge, the preservation of historic monuments, and the conservation of medieval stained glass.

CCMS also stages round tables as forums for informal exchanges of information and opinions by policy-makers on environmental issues. These round tables give NATO members

Germany, Japan, the Netherlands, and Sweden are particularly fruitful. Although smaller in scope, EPA's contribution extends to many other countries as well. At any given moment, EPA personnel may be busy with foreign colleagues on stationary source control, economic incentives, hazardous waste management and enforcement, acid deposition effects, and improved regulatory approaches. All this tends to upgrade EPA's effectiveness at home.

In addition to the industrialized nations, EPA also works with Third World countries. In many of these nations, degradation of natural resources and ecosystems stems largely from rapid population increase, which—far more than industry—carries the major threat. Although population growth is not in EPA's bailiwick, the Agency does assist Third World governments on such matters as pesticide management and ground-water pollution, as well as urban blight.

The Aftermath of Chernobyl and Bhopal

In December 1984, thousands died in Bhopal, India, after inhaling toxic methyl isocyanate gas accidentally released by a subsidiary of Union Carbide. In April 1986, a once-prosperous region of the Ukraine had to be evacuated as a result of the devastating nuclear accident at Chernobyl.

These two mega-disasters have given a new direction—and a new sense of urgency—to EPA's international activities: they have raised awareness of the need for prompt reporting of environmental disasters, whether in the immediate vicinity of an explosion or leak, or across national boundaries hundreds of miles away.

In the immediate aftermath of Chernobyl, EPA's Office of Air and Radiation worked closely with the Agency's Office of International Activities to allay public fears about the possible health impact of wind currents reaching the United States from the direction of the Ukraine. EPA's environmental monitoring field stations and labs, built to analyze domestic and near-border U.S. air, were suddenly harnessed to an international task never envisioned by their originators.

To streamline EPA's Third World support, the Administrator last year set up a Developing Countries Staff within the Office of International Activities. This staff has responsibility for focusing EPA aid in the Third World and determining how the Agency's limited technical and financial resources can be most effective. EPA has also strengthened its links with international environmental and development organizations such as the U.S. Agency for International Development (AID), the World Bank, and the U.N. Regional Banks in Asia, Africa, and Latin America.

Another strategy calls for direct, bilateral cooperation between EPA and counterpart agencies in selected nations. In India, for instance, EPA is contributing to a multi-year cleanup of the River Ganges, sacred to millions of Indians but long a conduit for human, industrial, and agricultural wastes.

Indian Prime Minister Rajiv Ghandi has

Increasingly, it is becoming commonplace for EPA scientists and decision-makers to view the whole world as their "bailiwick." Of course, it is essential to work through the proper channels. In most cases, environmental disasters can still be contained within national boundaries by sovereign governments acting strictly on their own authority. But to protect the United States from unforeseen catastrophes, EPA and other federal agencies have placed an increasing emphasis on emergency preparedness. Protective action guides are being prepared for all federal agencies, as are criteria and standards for officials in state and local governments.

EPA has also talked with the WHO and OECD to "harmonize international radiation levels." This joint effort should provide consistent criteria for when citizens should stay indoors and store owners should remove produce, dairy goods, and other radiation-impacted foods from their shelves when an emergency arises.

In addition, the United States has approved a convention recently negotiated by the International Atomic Energy Agency. Signatories have agreed to provide early notification after any serious radioactive leak, as well as mutual assistance in dealing with its transboundary and internal aftermath.

vigorously attacked this issue since he assumed power in 1984, and has welcomed EPA's input. To date, six EPA teams have traveled to India to help assess the damage and devise a remedial plan.

Since 1972, EPA has also increasingly collaborated with the Soviet and Chinese governments. The environment provides a vehicle for East/West meeting of the minds, despite ideological and economic differences.

EPA has long been the lead U.S. agency in a bilateral pact with the Soviet Union. This agreement commits the two most powerful countries to cooperate in 11 different aspects of environmental preservation. EPA Administrator Thomas and his Soviet counterpart, Yuriy Izrael, co-chair the agreement. Thirty-eight joint research projects are now underway.

EPA is presently negotiating a new research agreement with the Polish Ministry of Environmental Protection; the terms should be announced shortly. EPA's Dr. Gary Waxmonsky, on detail to the State Department as Science Counselor to Warsaw, is participating in this effort.

EPA also has close relations with environmental scientists and regulators in the Peoples' Republic of China (PRC). The Agency and Chinese scientists have examined a lung cancer epidemic in southwestern China, and EPA is China's partner in control technology, as well as processes and effects research. The results of the study were recently highlighted in *Science* magazine. This summer, a Chinese delegation will visit EPA headquarters to determine how an environmental protection protocol should be implemented.

Since EPA's inception in 1970, the international community has looked to us for leadership in environmental protection. We try to ensure that this mutuality of interest translates into better lives for more people. □

(Until recently, Green was EPA's Associate Administrator for International Activities. He is now writing a book.)

(Editor's note: As the Journal went to press, diplomats at an international meeting were signing an agreement to greatly reduce the use of chemicals that break down the protective layer of ozone in the stratosphere.)

A Guide to Planet-Conscious Decision-Making

Environmentalism: A Worldwide Issue

US government, United Nations, research, developmental, and environmental organizations are joined in a worldwide effort to protect the environment.

Setting the Global Environmental Agenda

UN World Commission on Environment and Development, Organization for Economic Cooperation and Development, NATO Committee on Challenges of Modern Society, European Economic Community, bi-lateral and national groups; all help establish priorities.

Financing Environmental Efforts

Funds for developing countries come from the World Bank, regional development banks, US Agency for International Development, national governments, private sources and foundations. Banks insist on environmental integrity in funded projects.

Negotiating International Agreements

UN Environmental Programme, International Maritime Organization, International Atomic Energy Agency, and other groups help negotiate environmental pacts.

Technical Assistance

Technical assistance is provided by UN and US government agencies, foundations, and trade associations.

Emergency Help

UN and national agencies like EPA monitor pollution; UN coordinates international response. US may provide emergency funds, technical help.

Promoting Environmental Awareness

Hundreds of private research, activist groups worldwide join UN, OECD, International Chamber of Commerce, EPA in continuing information, educational activities.

Dealing with Industrial Emergencies

by Mostafa Tolba

Slightly less than one year ago, the Swiss chemical company Sandoz spilled approximately 10 tons of poisonous chemicals into the Rhine River. An estimated 450 pounds of mercury flowed into the river. Human folly had allowed the accident to happen, and human effort must clean it up and make sure that it doesn't happen again.

Fortunately, the question of international pollution is receiving more attention than it has in the past. Gradually, international agreements are being developed and are coming into force to deal with major pollution problems. There are gaps, however. There are no binding global agreements for dealing with hazardous waste or with harmful chemicals.

In 1983, the OECD reported that an estimated 2.2 million tons of hazardous waste crossed the national boundaries of its member states by rail, road, or waterway for the purposes of treatment, storage, or disposal. Overall, more than 10 percent of the hazardous waste produced in the OECD countries crosses an international frontier at some time. At a rate of 100,000 cross-border shipments every year, the OECD averages more than one international shipment every minute.

Yet there is no global agreement on the procedures for handling, registering, and disposing of these wastes. A number of countries and certain groups of countries have set in place their own local procedures, but these are neither standardized nor general. And while the international community appears to accept early notification as a concept, there are no developed procedures or obligations spelled out in national law or in international agreements. The Governing Council of the United Nations Environmental Programme (UNEP) met in June of this year and asked the Executive Director to develop a convention for the environmentally sound management of hazardous wastes and to study the feasibility of

developing a convention for the exchange of information on harmful chemicals in international trade.

Sandoz reminded us of the price we pay for not listening and talking with our neighbors and for not planning ahead. Incompatible alarm systems, warnings issued in the wrong languages, uncertainty as to who were the competent authorities in neighboring countries: all these problems made the Rhine disaster worse than it needed to be. The inadequacy of contingency planning and the non-existence of mutual assistance programs further worsened the situation. The existing treaty calling for the protection of the Rhine from pollution reminded us that while the western world has made substantial progress in handling cases of chronic pollution, it is still largely unprepared for emergencies.

There is no reason for the international community to be so ill-equipped to deal with industrial emergencies.

There is no reason for the international community to be so ill-equipped to deal with industrial emergencies. Procedures need be neither complicated nor expensive; they simply have to be developed and standardized.

A number of countries, such as the United States, Canada, France, and the Federal Republic of Germany, as well as the Scandinavian countries and some others, have developed procedures for handling at the national level industrial emergencies involving potentially toxic chemicals. With suitable adjustments, these procedures could be used as a good basis in the formulation of international agreements or programs to be used by different countries all over the globe.

UNEP has examined existing national legislation and bilateral agreements

already in place, and is proposing a global legal framework in which to initiate the handling of industrial emergencies. Within this framework, a number of issues should be considered, including early notification, provision of mutual assistance, determination of liability, assessment of environmental damages, victims' compensation, and the availability and utility of insurance. Given the complexity of these issues, the two that can and should be tackled most readily are early notification and provision of mutual assistance.

Notification and assistance pose very different problems to the international community, problems that should probably be dealt with by two separate but harmonized legal instruments. The process of notification poses considerably less intricate obligations than the provision of assistance.

Countries may be willing to "sign on" immediately if notification is all that is required. If the obligation to notify is linked to the obligation to provide assistance, countries—particularly poor countries that may lack the means to provide assistance—may delay or even decline to become parties to such an agreement.

In addition to the two conventions, UNEP is proposing that nations be helped in developing Industrial Emergency Preparedness Programs at the community level. Again, these programs would be shaped from schemes already worked out by various national governments and groups such as the Chemical Manufacturers Association. They would enable government, industry, and local authorities to craft their own programs based on a tried and tested model.

The goal of the preparedness program would be to assure that communities identify potential industrial hazards and be prepared to prevent them if possible, but if not, to deal effectively with accidental releases of acutely toxic chemicals. Developing community



awareness and contingency planning would be essential parts of that program.

As a first step, government, community leaders, and industry would work together to identify potential industrial hazards in their communities and to outline precautions that could be taken to limit this threat. In cooperation with industrial interests and civil authorities, community leaders would prepare and carry out public awareness activities, including the development and dissemination of an emergency response contingency plan.

All three initiatives emphasize minimum regulation and maximum voluntary participation. Because the preparedness program would be developed and carried out at the local level, no international instrument would be needed at all.

At UNEP's Governing Council in June, participating governments reviewed

Swiss firemen battle an early morning blaze at the Sandoz chemical plant in Muttenz near Basel, Switzerland. While the fire destroyed some 500 tons of chemicals, another 10 tons of contaminants emptied into the Rhine River, causing one of the most serious spills of hazardous pollutants in recent times.

these proposals and indicated a desire to push ahead with them. A number of international organizations and industry groups have also expressed their support.

The UNEP initiative is meant as a complement to national actions. Governments will take appropriate actions regarding preventing and dealing with industrial accidents according to their own judgment.

At the international level, however, these actions should be coordinated. Adopting reasonably similar procedures and contingency plans at the local level would facilitate harmonized approaches

when more than one community is affected or when transboundary accidents occur. A little more forethought and planning could prevent many chemical disasters and could limit the effects of many others. More than a financial commitment, the international community is looking for a political commitment: a commitment that indicates that governments accept that their actions can and do affect the environment of their neighbors and that they are willing to share with their neighbors responsibility for shared problems.

We have the means now to take the first steps to address accidents that are a major worldwide concern. It remains to be seen whether we will act before the spur of tragedy prods us again. □

(Dr. Tolba, an Egyptian microbiologist, is the Executive Director of the United Nations Environment Programme.)

Building a Consensus on Complex Environmental Problems

by Stephen R. Seidel

Watching a trout dart through pristine waters along a shallow river bottom. Gazing through a crystal clear blue sky across a valley toward a distant mountain range. The simplest aspects of our environment are often the most appealing. Yet environmental problems can be strikingly complex. Developing solutions to them present some of the biggest challenges to our future prosperity.

Before the first national pollution laws were drafted, if you or your property suffered damage from someone else's pollution, you could go to the local magistrate and sue. This remedy was perfectly suitable when waste from cows or households was the principal source of pollution. But as industries expanded and farmsteads grew into urban centers, the need developed for state and then national environmental requirements.

We now find that the complexity of environmental problems has increased dramatically in several dimensions. First, it is no longer a simple matter to demonstrate cause and effect. For example, studies to predict the potential adverse effects of pollutants now frequently involve complex modeling of ecosystems, the atmosphere, and their interactions. Furthermore, through medical advances, we now realize that many harmful effects from exposure to pollutants will surface only after a latency period of several decades. Increasingly, environmental policy-makers find themselves turning to the scientific community for answers that may not yet exist.

Second, with advanced industrialization, the local pollution problems from the farm turned first into national problems, and soon after that into regional or global problems. Climate changes (the greenhouse effect), stratospheric ozone depletion, and marine pollution are examples of recent environmental problems that are not limited by jurisdictional boundaries.

Given the potentially enormous risks, these problems cannot be ignored.

Finally, harmony between economic prosperity and environmental well-being remains an elusive goal. For example, in many developing nations, the basic need to expand food production continues to jeopardize forest ecosystems. In developing countries, growing prosperity has produced problems of waste disposal and increased reliance on potentially harmful chemicals. Progress toward "sustainable growth," as described in the recent report of the United Nations' World Commission on Environment and Development, is essential for developing and industrialized nations alike.

Will our seeming propensity for creating new and more complex environmental problems overwhelm our ability to find and implement solutions? Given the significant efforts and initial successes of the past few years, there is some basis for optimism. Although much more needs to be done, the groundwork exists for dealing with current and future problems in a timely and effective manner.

Instead of listing the scores of international environmental efforts that are now underway, it might be useful to examine two in some detail. Recent activities related to protecting the earth's stratospheric ozone layer and to better understanding climate shifts related to the El Niño phenomenon provide illustrations of nations working together toward improving our global environment.

The ozone problem has all the characteristics of the new generation of environmental hazards. It is scientifically complex. The ominous discovery of the Antarctic "ozone hole" caught the research community completely by surprise. The "ozone hole" is so called because it has been the site of seasonal reductions of up to

50 percent in stratospheric ozone levels. These reductions have occurred during the Antarctic spring (August and September) for the past 10 years. It is a global problem, and it strikes at the balance between environmental protection and our quality of life.

The earth's ozone layer blocks out most of the sun's damaging ultraviolet radiation. If this ozone layer is depleted, scientific evidence suggests the consequences will be increased skin cancers, damage to crops and aquatic organisms, and other environmental problems. All nations will be affected, not just those using chlorofluorocarbons (CFCs), the family of chemicals that scientists believe are linked to ozone depletion. CFCs are used in many consumer goods, including refrigerators, computers, and air conditioners.

Yet the nations of the world appear to be on the verge of an agreement to substantially phase down global use of these chemicals. Following several years of negotiations under the auspices of the United Nations Environmental Programme, an agreement will likely be concluded at a Diplomatic Conference scheduled for mid-September 1987. Most if not all of the major CFC-producing nations and many developing nations are likely to participate in this treaty.

An agreement now seems possible for several reasons. Through an elaborate series of international meetings and joint economic and scientific assessment, policy-makers now understand and agree that despite remaining scientific uncertainties, the large potential risks of ozone depletion warrant action. They also seem to understand that prudent action now will not mean the elimination of consumer products that rely on CFCs, but instead will provide the needed impetus for industry to develop environmentally safe alternatives. An agreement on stratospheric ozone could



A torrent of water rushes through downtown Salt Lake City, the product of a snow melt from Utah's Wasatch Range caused by the phenomenon known as "El Niño." This naturally occurring climatic condition triggers floods and monsoons, drought and fire.

serve as a model for dealing with similar global pollution problems.

Unlike stratospheric ozone depletion, the El Niño phenomenon does not result from human activities but involves a naturally occurring sequence of changes that begins every couple of years in the atmosphere and oceans of the Southern Hemisphere and dramatically affects most of the world's climate. The Spanish term "El Niño" refers to "the child" (Christ) because this climate event typically begins around Christmas time.

Although much remains to be learned about El Niño, it appears to begin with a shift in the relative atmospheric pressures above two oceans in the Southern Hemisphere, which alters the magnitude and sometimes even the direction of the winds. In turn, these changes reverberate throughout the climate system, altering ocean temperatures and currents, wind and storm patterns, the timing and magnitude of monsoons, and the occurrence of floods and droughts.

Some episodes of El Niño involve far more dramatic changes in climate than others. The recent event in 1982 was

one of the most severe on record. During that period, climatic anomalies became commonplace in regions spanning most of the globe. For example, Australia suffered one of its worst droughts in 200 years, with estimated losses of \$2 billion in agriculture and livestock. The coast of California experienced widespread flooding and large property losses from coastal storms, while drought worsened throughout Africa, and rainfall accompanying the monsoons in India was diminished. Although no estimate of the overall human and economic losses exists, the numbers would surely be staggering.

The El Niño phenomenon involves exceedingly difficult scientific issues. The research community has come a long way in understanding its causes, but many questions remain. Its effects clearly go well beyond national boundaries, and its economic impacts strike at the very heart of many nations struggling for improved prosperity.

Because El Niño appears to be a natural phenomenon, not caused by human pollution, scientific efforts have focused first on gaining a better understanding of its origins and development, and second on improving

our ability to forecast future events to enable cost-minimizing responses. Since its inception in 1985, an international "Tropical Oceans and Global Atmosphere" (TOGA) program has been directing a coordinated scientific research effort aimed at answering the questions surrounding El Niño. TOGA is part of the World Climate Research Programme organized by the World Meteorological Organization and the International Council of Scientific Unions. Currently, more than 20 nations are participating in this scientific endeavor.

Efforts to protect the stratospheric ozone layer and to better understand the El Niño phenomenon provide just two examples of the many activities now underway to improve our environment. While the magnitude of tomorrow's challenges should not be underestimated, these programs show how nations can go forward together to deal effectively with global problems in order to safeguard our environment for our own and future generations. □

(Seidel is a senior analyst with EPA's Office of Air and Radiation.)

Saving the Tropical Forests: A Beginning

by James Gustave Speth

The world's wet and dry tropical forests are home to half the living things on Earth, though they occupy only 12 percent of the Earth's land surface.

In one lush, four-mile square of tropical forest, you can find 1,500 species of flowering plants, 750 of trees, 400 of birds, and 150 kinds of butterflies.

The world's wet and dry tropical forests are home to half the living things on Earth, though they occupy only 12 percent of the Earth's land surface. They also sustain the basic needs of millions of people worldwide, provide raw materials for a vast array of industrial products and processes, and help maintain environmental stability.

The products provided by the rich genetic resources of the tropical forests range from coffee and spices to bananas and nuts, from treatments for childhood leukemia and Hodgkin's disease to medicines for arthritis and rheumatic fever. They are depended on for industrial products such as oils, resins, latexes, waxes, tannins, and dyes.

Tragically, these forests are being destroyed at a devastating rate: 27 million acres a year—an area the size of Virginia—or about 3,000 acres an hour. To appreciate the severity of this problem, consider some of the other contributions that tropical forests make to the Earth:

- They protect watersheds and regulate water flow for farmers who grow food for well over one billion people. In many semiarid regions, tree fodder accounts for 20 percent of the feed of herding livestock. Tropical forests also provide fruits, nuts, animal protein, and a variety of other basic necessities for 200 million forest-dwellers.
- Wood accounts for 76 percent of total energy consumption in Africa, 42 percent in Asia, and 30 percent in Latin America. In addition, upland forests protect downstream hydropower facilities by helping to control erosion and sedimentation and regulating water supplies.
- Over the past decade, exports of industrial forest products by developing countries have averaged about \$7 billion (1984 dollars) and rank fifth overall in non-oil exports. In tropical countries themselves, small-scale, forest-based enterprises are often the most significant source of non-farm employment and income.
- There is growing scientific evidence that tropical forests are critical to maintaining the earth's temperature and climate, which make human habitation possible on this planet.

Tropical forests have declined by nearly half in this century and continue to disappear rapidly. Latin America and Southeast Asia have lost two-fifths of

their tropical forests. In Africa, almost six million acres of dry tropical forests were destroyed each year between 1980 and 1985. Most developing countries plant only 5 to 10 percent of what is needed to offset forest losses and meet increasing demands for forest products.

Extinction of plants, birds, and other wildlife is only one of the devastating results of this destruction. Once damaged, forest ecosystems begin to collapse. The soil loses its nutrients and becomes less fertile, irrigation systems are flooded and damaged, fuelwood becomes scarce, crops and livestock are lost, and drought increases. Breeding and feeding areas for fish, birds, plants, and wildlife are disturbed or destroyed.

The causes of deforestation are rooted in a complex web of social, economic, and institutional problems. Among them are the combined effects of poverty, skewed land distribution, unstable land and tree tenure, low agricultural productivity, lack of access to credit and markets, and rising population pressure, all of which force farmers to move into forests for land to grow crops. Destructive logging practices and large-scale development projects such as roads and dams are also important forest-destroying factors. So are the low-priority status of forestry in national development plans, and institutional weaknesses in forest management, research, training, and extension programs within developing countries.

But the grim prognosis notwithstanding, the destruction of tropical forests can be halted. Many economically and socially viable and technically sound solutions to problems of deforestation and land misuse have been demonstrated to have the potential for widespread implementation.

The centerpiece of a major international effort to address these solutions to tropical deforestation is the Tropical Forestry Action Plan, jointly sponsored by the Food and Agriculture Organization of the United Nations (FAO), the World Bank, the United Nations Development Programme (UNDP), and the World Resources Institute (WRI). The plan aims to increase political and public awareness of the severity of tropical forest destruction and to mobilize the human and financial resources needed for a concerted global effort to combat such deforestation. It is based on two major reports released in 1985: the FAO's "Tropical Forestry Action Plan," and "Tropical Forests: A Call for Action," by the World Bank, UNDP, and WRI.

The World Bank recently announced its commitment to more than double its annual level of lending for forestry-related activities, increasing it from \$138 million this year to \$350 million in 1989. Total development assistance in forestry, including loans and grants, is expected to grow from about \$600 million a year in 1984 to over \$1 billion a year in 1988.

FAO has created a Tropical Forestry Action Plan Secretariat to assist national governments and the development agencies in mobilizing technical assistance support for improved planning and project implementation. A development assistance coordination group, comprised of the Forestry Advisors of all multilateral and bilateral development assistance agencies, has been created. It has met four times to review Action Plan progress and to discuss ways to improve aid coordination and effectiveness. The process is now shifting to the national level; new forest development projects are being identified and funded.

An unprecedented step in the worldwide effort to combat the destruction of tropical forests was taken

A worker tends to young tropical trees in Costa Rica as part of a tree farming project. Such efforts are vital, for the world's wet and dry tropical forests are being destroyed at a rate of 3,000 acres an hour.

this summer when a distinguished group of government ministers, scientists, and world political, financial, and nongovernmental leaders met at Bellagio, Italy. This meeting was sponsored by the FAO, World Bank, UNDP, WRI, and the Rockefeller Foundation. Their goal was to identify strategies for implementing the Tropical Forestry Action Plan. These strategies included ways to mobilize greater resources, help national governments incorporate Action Plan proposals into their national development plans, identify major areas for policy reform, and assess the role of local, national, and international institutions for implementing the strategies conceived at the meeting.

The participants produced a "Bellagio Statement" of conclusions and recommendations. "The Bellagio Conference shares the sense of urgency for global action called for in the Tropical Forestry Action Plan," it began. Among its recommendations for addressing the crisis are:

- Generation of political commitment for support of the Action Plan by making country-by-country assessments that specify the impacts on human welfare and the environment of failure to contain deforestation.

- Incorporation into the national development plans of the worst affected countries of a long-range strategy for conservation and sustainable use of their tropical forests. This should happen within five years.

- Assistance to developing countries to implement a major program for involving local communities in forest conservation and tree-planting.

- Action by governments to remove subsidies and other policies that encourage economic inefficiency and over-harvesting of forest resources. Development assistance agencies should ensure that their activities contribute to the protection rather than the destruction of natural ecosystems.

As the Bellagio Conference and Statement show, the Tropical Forestry Action Plan has focused attention on the tropical forest crisis confronting us. What is needed now is world action to halt and ultimately reverse the destruction of the natural resources upon which millions of Earth's inhabitants depend. □

(Speth is the President of the World Resources Institute, a Washington-based policy research center.)



Awakenings at the Grass Roots

by Jay D. Hair and Barbara Bramble



M. A. Chappell, Animals Animals

Monarch butterflies rest in tree branches during their annual migration south. Conditions for their arrival in Mexico have been improved, thanks to the efforts of Monarca, a nongovernmental organization (NGO) that convinced the Mexican Ministry of Human Settlements and Ecology to establish a breeding habitat and 37,000-acre buffer zone for the butterflies.

Environmental grass roots activism, although nowhere as sophisticated or as powerful as it is in the United States, is thriving around the globe. Worldwide, there are more than 5,000 grass roots environmental, consumer, and related organizations called NGOs, for "nongovernmental organizations." While NGOs vary in their organizational structure, degree of activism, and methods of operation, they share several characteristics.

NGOs originate from community initiatives. Established without support from, or dependence on, their government's financial assistance or facilities, they are typically independent of political affiliates and set their own program agendas. They are free to voice the concerns of the people who would be most dramatically affected by proposed development.

As Khor Kok Peng, research director of the Consumers' Association of Penang in Malaysia, observed, "The role of the NGO is that of a catalyst, a facilitator, and a help to the community. Its role is not only vital, but perhaps indispensable if poor communities are to build the capacity to genuinely participate in development."

In many ways, the international NGOs are similar to environmental groups in the United States, which derive their strength from local clubs and organizations. Like their counterparts in the United States, they represent

millions of individuals who have learned that environmental protection and economic survival go hand-in-hand.

Environmental activism is not really a new phenomenon in most parts of the world. Some of the well-recognized and more traditional international environmental organizations have had chapters in Europe and elsewhere for several decades. But several key events in the early 1970s fueled the growth of community-based and community-born NGOs.

Perhaps the most significant impetus was the 1972 United Nations' Conference on Human Environment in Stockholm, Sweden. That first international conference, fully reported in the news media, heightened awareness about environmental consequences among the well-educated and politically influential opinion leaders of developing countries.

Out of that international conference was born the U.N. Environment Programme, a separate department of the United Nations that deals with environmental issues. The Programme provided funds for the establishment in 1974 of the Environment Liaison Centre (ELC), headquartered in Nairobi, Kenya. The ELC began as a coalition of only a handful of developed countries' NGOs, which were prime movers at the Stockholm conference. But today, with a

membership of approximately 220 worldwide organizations, the ELC has evolved into a full-fledged information and networking center. Its journal, *ECOFORUM*, is sent to nearly 6,000 NGOs, governments, intergovernmental organizations, and individuals.

The growth and the programs of the ELC have been key factors in the growth of NGOs around the world, including such coalitions as the Kenya Energy NGOs (KENGO), the Pesticides Action Network, the NGO Task Force on New Approaches to Development, and the Renewable Energy and Environment Conservation Association. In fact, the ELC's 1982 symposium on "The Environment and the Future" was perhaps the first meeting at which the number of NGO leaders from developing countries equalled the number from the industrialized world.

The most important factor in the growth of NGOs in the developing world, however, has been the determination of poor and disenfranchised communities to protect their cultures while improving their livelihoods. In Brazil, for example, a few traditional conservation groups have attracted members for more than 30 years, surviving two decades of military government and working to protect environmental values.

But Brazil's environmental movement has grown far beyond the scope of these traditional conservation organizations. Today, 350-400 NGOs operate in Brazil, giving voice to the villagers and subsistence farmers whose lives are directly affected by the government's environmental actions. While many of these organizations were first conceived by activists from outside the community, all are working today because they have galvanized local concern and commitment.

The Institute for Amazon Studies in Curitiba, Brazil, is one example. Created in 1985 to help protect the Amazonian rain forest, the Institute in just two years has become a sophisticated activist organization using both scientific and legal tools. Under the leadership of Dr. Marie Allegretti, it has filed lawsuits against the illegal clearing of tropical rain forests and the destruction of Brazil's wild nut trees, and its scientific studies and advocacy work in the courts and the state capital have also supported Brazil's native rubber tappers, who have long been concerned about deforestation.

Since 1986, the rubber tappers have been organized into their own group,

the National Council of Rubber Tappers. A coalition of local and rural rubber tappers unions, the National Council is truly a grass roots organization, founded by natives and with its leadership elected from within its membership.

The National Council has begun to have real clout. Only recently, the Council of Environment, a nongovernmental organization representing private industry, state government agencies, and NGOs, voted to support the rubber tappers' most important proposal: federal government action to set aside an "extraction area" to be managed for rubber tapping, thus protecting the tropical rain forest. The Council of Environment, an influential national force, is now expected to propose designation of an extraction area to the Brazilian legislature, which generally heeds the Council's recommendations.

In addition, members of the National Council of Rubber Tappers traveled this year to the United States and Great Britain to confer with international environmental experts on how to change the environmentally destructive policies of international financial institutions.

Worldwide, there are more than 5,000 grass roots environmental, consumer, and related organizations.

Much the same trend is evident around the world. For several decades, Mexico had only two very traditional conservation organizations. Now, 28 formally organized groups have been operating under a coalition called the Conservation Federation of Mexico (FECOMEX).

The coalition has helped persuade the Mexican government to take 21 separate actions to clean up the air in Mexico City, one of the world's most densely populated and polluted cities. Among the 21 actions is the establishment of a clean air council for the city. Moreover, FECOMEX prevailed on government authorities to seat an NGO representative on the council.

Another group, Monarca, last year convinced the Ministry of Human Settlements and Ecology to consider establishing the common monarch butterfly's breeding habitat and a 37,000-acre buffer zone as an international biosphere reserve. Monarca's actions came in time to protect the butterfly's winter haven and mating sites.

In another part of the world, the Indonesian Environmental Forum (locally called the Wahana Lingkungan Hidup Indonesia, or WALHI) was formed in 1980 and now provides communications and support to more than 320 NGOs.

Although environmental awareness is relatively new in Indonesia, the NGOs are already making an impact. In 1982, for example, KRAPPI (Volunteers Against the Misuse of Pesticides) was formed by 12 NGOs. It has grown to encompass 19 organizations, including the Indonesian Consumers Organization. KRAPPI has exposed several cases of DDT poisoning, with the result that construction of a planned DDT manufacturing plant has been cancelled. Additionally, the government has banned the sale of DDT for agricultural use.

Most recently, 22 NGOs have established a network called Volunteers for the Control of Pollution (SKREPP). Although new on the scene, this coalition has already raised awareness about mercury pollution in Jakarta Bay and is protesting pollution from a cement factory in Cibinong producing uncontrolled dust that has caused respiratory problems among villagers.

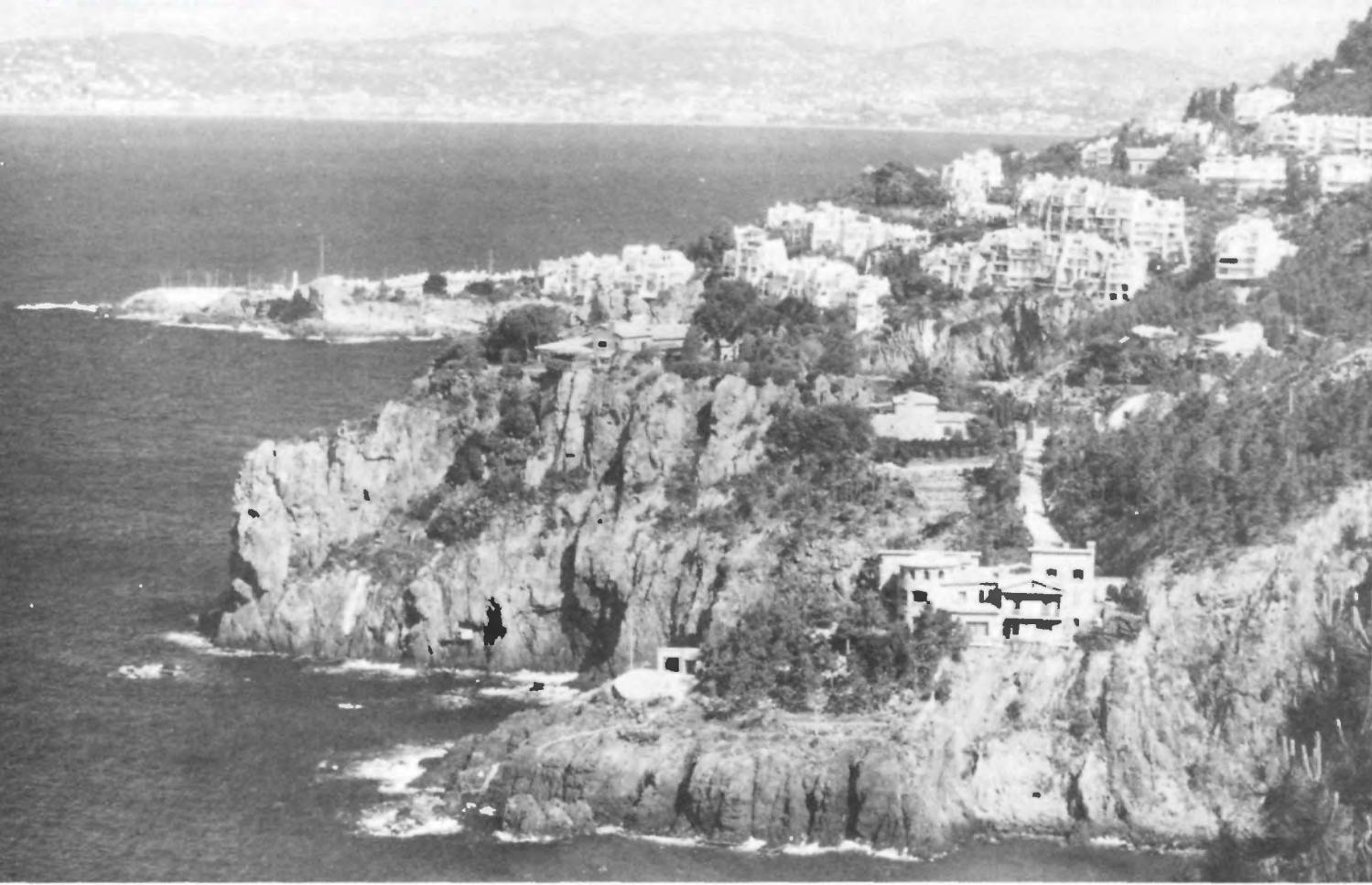
The strength and message of the world's NGOs are beginning to reach the international financial community. Under pressure from environmental activists, the World Bank recently announced the formation of an environmental department and the hiring of new staff. And this year, the Inter-American Development Bank for the first time invited representatives of NGOs to meet and discuss the bank's environmental and loan policies. Representatives from 15 Central and South American countries and the Caribbean attended and later formed an informal network to keep the pressure on and information flowing.

In the 1970s, the World Bank, the Inter-American Development Bank, and other international organizations would have had difficulty identifying viable NGOs with which to discuss these issues. They have no such difficulty today. The NGO movement around the world is still expanding and changing. Each day, the roster of NGOs grows as new groups of grass roots activists band together for a better tomorrow. □

(Hair is President of the National Wildlife Federation, and Bramble is Director of International Programs for the Federation.)

The French Riviera. Along with several other agencies, the World Bank is exploring the possibility of an environmental plan to protect the Mediterranean.

Mike Yamashita, Woodfin Camp & Associates



Giving the Environment Its Due at the World Bank

by Barber B. Conable

Environmental protection and economic development have not always been pursued with equal vigor in the developing world. As one observer phrased the issue, "You can't talk about environmental protection to a country that's on the margin of survival."

But after many years of experience, the World Bank has discovered just the opposite—environmental issues must be discussed with developing countries,

including the poorest, because the goals of poverty alleviation and environmental protection are not only consistent, they are interdependent. A vital lesson now being learned in the developing world is that sustained development depends on managing resources, not exhausting them.

The World Bank has long recognized the close interaction between development and the environment. It was the first international lending institution to establish explicit policies on limiting any harmful environmental consequences of development projects it financed. The World Bank has also supported many projects with strong environmental components, such as over \$1 billion in development loans for forestry projects in the last decade.

But in fields as dynamic as development and the environment, it is to be expected that the World Bank would on occasion misjudge the environmental aspects of its projects. For example, a recent project in Brazil, known as Polonoreste, was a sobering

case of a well-intentioned effort with numerous environmental safeguards that ran into difficulties. The bank misread the human, institutional, and physical realities of the Amazon rain forest as the area came under increasing pressure from migrants seeking their future on this Brazilian frontier. Protective measures to shelter fragile land and tribal peoples were included, but they were not carefully timed nor adequately monitored and enforced. When the mistake became apparent, the World Bank suspended disbursements on the project until corrective measures were put in place.

The Polonoreste project was a pivotal experience for the World Bank. Bank experts learned that ambitious environmental design requires realistic monitoring and enforcement mechanisms. Where institutional safeguards are weak, the bank must act as a positive force to strengthen them. Environmentally sound development

requires the bank to be part of the action, and much more than in the past, it will be. This will require both organizational changes in the institution and philosophical shifts in terms of its policy approach.

As part of the recent reorganization of the World Bank, a top-level Environment Department has been created to help set the direction of bank policy, planning, and research work. At the level of the bank's day-to-day lending operations, an Environment Unit has been established in each of the four regional complexes of the bank where development projects and environmental safeguards are negotiated and monitored. From the handful of environmental specialists formerly in place, these recent organizational changes will eventually more than double the number of environmentalists as well as increase the use of outside consultants to handle specialized problems.

Philosophically, the World Bank is, as its charter specifies, an economic institution. But environmental action adds a new dimension to the bank's fight against global poverty; it recognizes that sound ecology is good economics.

The World Bank will continue to lend to developing countries for projects in energy and infrastructure, industrialization and irrigation, but it will do so with greater sensitivity to their long-term environmental effects. The bank will place a new emphasis on correcting economic policies that promote environmental abuse. As before, the bank will withhold support for those projects where environmental safeguards are inadequate; and in the future, the bank will institutionalize a broader and more comprehensive approach that puts a premium on conservation.

As part of these philosophical and institutional changes, the World Bank will allocate resources to four new environmental initiatives. These are directed to the bank's clients: the governments of developing countries. Here, the bank's purpose will be to integrate better management practices of natural resources into overall development planning and investment.

The first task will be to develop better knowledge of the problems and opportunities we face. To gain that understanding, the bank will use its added staff resources in a collaborative series of efforts to assess environmental problems and management issues in a number of vulnerable developing countries. By looking closely at market

forces and broadly at all key sectors of development activity, these assessments will identify both the effective and destructive factors shaping and distorting the environment, and how these factors affect economic growth and poverty alleviation.

The objective will be to establish in economic terms the value of resources such as topsoil and grass cover, water and drainage, forests, and wilderness that are too often considered insignificant. The detailed surveys will demonstrate in economic and environmental terms, for instance, what subsidies to pesticide producers and timber cutters cost in ruining the land and driving families from it. The real price of wilderness resettlement will be measured against the expense of health and family-planning clinics, of agricultural extension services, of new crops and new farming techniques. These surveys will assemble the knowledge needed to move the bank further towards its goal of environmental rationality in its lending programs.

The second initiative to be launched by the World Bank will be an international environmental rescue and development effort in Sub-Saharan Africa. As per capita incomes have declined in Africa over the last 15 years, deserts have spread, forests have dwindled, and soil has washed away.

The pressure of population growth, urbanization, agriculture, and fuel wood consumption are stripping West Africa alone of 8.9 million acres of forest a year. Desertification in just one country, Mali, has drawn the Sahara 220 miles further south in the last 20 years. The bank will undertake a special program of technical studies to identify and assess urgent, promising environmental protection projects that will be regional in their scope.

Thirdly, tropical forests in Africa, Asia, and Latin America also demand priority attention. Deforestation is leading to widespread degradation of the natural resource base, undermining the capacity of the environment to support the economies and populations of developing countries.

The World Bank intends to more than double its annual level of funding for environmentally sound forestry projects to \$350 million by 1988-89. This, however, is more than a program of expanded lending; it will also focus on the policies of developing country

governments to ensure sustainability of the forests. Much is already known on how best to select wooded areas to preserve and how to train foresters and farmers in new techniques of tree breeding and the conservation of wildlands. With the gravity of the global danger and the know-how to avert it clearly at hand, the resources now must be mobilized to combat deforestation on a global scale.

Lastly, in the Mediterranean region, the bank stands ready to assist in an intensified international effort to protect the heritage of beauty and natural resources that 18 nations and some 400 million people hold in common. The governments of the Mediterranean states have long recognized the danger of pollution to public health and to fishing and tourism industries. Now, the World Bank, the European Investment Bank and Regional Development Fund, the United Nations Environment Programme, along with many other agencies, are exploring together the possibility of designing a broad, international project to improve the Mediterranean environment and strengthen it with a long-term preservation plan.

The World Commission on Environment and Development concluded in its excellent report, *Our Common Future*, that there is a "possibility for a new era of economic growth...based on policies that sustain and expand the environmental resource base." That optimism is tempered with caution. Many of the environmental problems widely recognized as urgent are still beyond man's technical as well as political capacities.

Stopping the advance of deserts, curbing rapid population growth, saving tropical rain forests, and protecting the planet's basic resources of air and water are all environmental necessities demanding more institutional coordination and political resolve than have yet been mustered by the international community. With its newly awakened environmental consciousness, the World Bank will play a much more active role in global efforts to preserve and protect the environment in developing countries. Working with an invigorated coalition of governments, institutions, organizations, and environmental activists the world over, the tempered optimism of today will surely yield to the environmental successes of tomorrow. □

(Conable is President of the World Bank.)

The Global Environment from an Industry Perspective

by Albert Fry



USX Corporation

Although they face the challenge of operating safely from an environmental standpoint wherever they are located, multinational corporations are viewed as important in meeting human needs through the goods and services that industry provides. Pictured above is a USX (Steel) Corporation building.

One of the theme rides at Disneyland is "It's a Small World." When we see photographs of Earth taken from space, the world does look small and beautiful—a wonderful swirl of blues, whites, and greens similar to the colors of EPA's logo. In many ways, we do live in a small world. Modern telecommunication and transportation systems have put all parts of the world in contact with one another. We arise in Geneva at 4:30 a.m. so that we can watch, live from Las Vegas, the Sugar Ray Leonard-Marvin Hagler fight. Jet aircraft—once they get out of the airport—put us within reach of exotic locations around the world in a matter of hours rather than weeks.

But in other ways, it remains a very big world indeed, with enormous distances and vast cultural and economic differences among nations. Visit Jaipur, only 120 kilometers (72 miles) southeast of New Delhi, the capital of India. In most of the developed world, this distance would be covered by car in one or two hours at most. The New Delhi-Jaipur trip takes five hours by bus, if you are lucky, and you can expect to pass many bullock-, camel-, and people-powered vehicles along a narrow though well-paved two-lane highway. Not only does the physical distance of 120 kilometers seem considerable, but you quickly realize how greatly socioeconomic infrastructures vary around the world.

As you globetrot by jet, the big city airports of the world may all look much alike and use similar equipment. But in fact, there are vast differences in the levels of technology in most industrialized countries as compared with developing nations. Where the pace of industrialization is accelerating in these developing countries, threats to the environment are increasing.

Differences in socioeconomic infrastructure, wide variations in technology, and diverse cultural attitudes: these are only some of the problems that complicate the relationship between industry and the environment in developing nations. It is also necessary to recognize that industry is not homogeneous. Industry includes, of course, the multinational corporations, the so-called MNCs. It also includes the large national corporations, sometimes privately owned but more

often government-owned or controlled. In addition, there are joint ventures and special arrangements between MNCs and large national corporations. There are also an enormous number of medium and smaller companies, and finally a plethora of very small businesses often employing 10 or fewer people.

The point is that there is no easy way to classify industry. It includes everything from the huge MNC petrochemical plants and nationalized integrated steel factories to small workshops that fabricate 10 rudimentary washing machines per day. But after all these disclaimers, some very interesting general observations can still be made about the role of industry in the international environment.

A radical change in mainstream environmental thinking has occurred over the past two decades. Just 20 years ago, the philosophy of the "Club of Rome," with its focus on the limits to growth, dominated environmental writing. According to this philosophy, the world was running out of natural resources and just about everything else. Limits to growth and especially industrial expansion were necessary to save the planet. This thinking often tended to identify industry as the villain creating all environmental problems.

Now, 20 years later, mainstream environmental thought regards industry as a partner in solving environmental problems. A recent report prepared by the World Commission on Environment and Development (WCED) is a case in point. The WCED summarizes its philosophy for the future as follows:

Our report, Our Common Future, is not a prediction of ever increasing environmental decay, poverty, and hardship in an ever more polluted world among ever decreasing resources. We see instead the possibility for a new era of economic growth, one that must be based on policies that sustain and expand the environmental resource base. And we believe such growth to be absolutely essential to relieve the great poverty that is deepening in much of the developing world. Many essential human needs can be met only through goods and services provided by industry.

This new environmental philosophy emphasizes "sustainable growth," a new term that is not yet fully defined. However, the term clearly implies growth that is compatible with our biosphere, and this means using resources efficiently by restoring or replacing them whenever possible. It also implies that economic activity—industry—can directly or indirectly relieve some of the stresses placed upon the environment by present practices in developing nations. There is an important message in this new philosophy: namely, that economic growth and environmental protection can be compatible. Such sustainable economic growth can occur only through cooperation between governments and industry.

There is a perception that many industrial corporations from the United States or other developed nations relocate to developing countries because such countries have lower or no pollution control requirements. Empirical studies by the World Wildlife Fund and the Conservation Foundation, World Resources Institute, and other academicians have not found any evidence to support this perception. It is true that developing countries often do have less stringent environmental requirements and less effective enforcement systems than most developed nations. It is also true that some industries in developing nations are still major polluters. However, these are not usually the MNCs, which now give high priority to the environment.

This may be partially explained by the more sophisticated technology and management experience available within MNCs. But it also reflects other, pragmatic forces. Once a large MNC has built its newest facility to meet stringent environmental controls in a developed nation, that plant becomes the model for its next capital investment. The MNC goes overseas to take advantage of lower wages or lower costs for raw materials, but it builds a carbon copy of the latest clean facility built in a developed country with stringent environmental regulations.

From a pragmatic standpoint, it is very expensive to modify the technical plans and systems, but even more important is the "reputation" factor. Most large MNCs have name recognition around the globe, and they sell their brand name products in many different countries. The last thing they want is a bad reputation as a polluter in a newly developing nation. Such a reputation would damage its image everywhere and eventually hurt sales in the

developed world, where consumers often boycott products made by companies with poor environmental reputations.

Ironically, there have been instances where governments have encouraged industry to maximize investment in productive capacity and spend less on "non-productive" environmental controls. When nations are desperate to feed, house, and clothe their citizens, pollution control—especially expensive controls—sometimes gets short-changed. This, of course, does not relieve industry from its responsibilities. It does, however, highlight the need for cooperation between government and industries everywhere, especially in the newly developing nations.

To begin with, MNCs must absolutely obey all the environmental rules and regulations in the countries in which they operate. But beyond this, they should also abide by the more stringent standards that they use in developed countries, modified only as necessary to accommodate unique local conditions. MNCs should set an example for indigenous companies operating within the developing nations. They should also provide technical advice on how to solve industrial pollution problems.

The International Chamber of Commerce has adopted "Environmental Guidelines for World Industry" and is actively encouraging trade associations and individual businesses to voluntarily comply with these guidelines. These guidelines apply to all industry, not just MNCs. A group of progressive MNCs has established and funded a new organization, the International Environmental Bureau (IEB), in Geneva, Switzerland, which is dedicated to information exchange on industrial pollution control technology and management among industries around the world. This technical information is provided without charge in the hope that more and more industries will voluntarily take action to reduce industrial pollution. These are only two small examples of how industry is assuming new responsibility for environmental quality.

In many cases, pollution control can pay for itself by reducing energy or raw material costs or reducing the volume of wastes that must be processed. In cases where the control costs cannot pay for themselves, the IEB stresses cost-effective solutions to pollution problems. The underlying philosophy is that good environmental practice is good business.

At first glance, the concept of uniform environmental standards appears very logical. However, such is not the case. The costs of environmental control vary widely depending on the level and type of economic activity, the geographical distribution of that activity, and the climatic and physical characteristics of countries or regions.

The benefits of any environmental standard also depend on the nature of the environment which is to be protected, and this, too, varies widely from country to country. Charles Pearson of the World Resources Institute, in his book *Multinational Corporations*, summarizes the situation as follows:

First, an attempt to establish internationally uniform standards for the purpose of harmonizing the international competitive position would be neither successful nor desirable on economic efficiency grounds.

Second, the correct general principle in both the industrial and developing countries is to establish ambient standards on the basis of a local calculus of costs and benefits, and to support these with effluent and emission standards on individual sources in a least-cost fashion.

The last sentence aptly describes a basic responsibility of governments, which is to carefully evaluate the special needs of each nation and then adapt a cost-effective pollution control program to meet reasonable environmental goals. Most of the major MNCs are pledged to cooperate and assist in achieving these goals.

Environmental rhetoric and confrontation make headlines in newspapers but seldom clean up pollution. Both industry and government officials in the developed world have learned that cooperation, open communications, and hard work are the ingredients that lead to environmental progress. The environmental problems in some parts of the developing world are still enormous. Industry, especially the MNCs, is striving to be part of the solution rather than part of the problem. □

(Fry, who previously worked for EPA and the Business Roundtable, is Deputy Director of the International Environmental Bureau in Geneva, Switzerland.)

Challenges Facing the Human Race: Excerpts from *Our Common Future*

by Kathryn L. Schmitz

In October 1984, the United Nations General Assembly established the World Commission on Environment and Development as an independent body comprised of 21 members—13 from developing countries and eight

from industrialized nations. Mrs. Gro Harlem Brundtland, Prime Minister of Norway, was appointed Chairman of the Commission. The Commission was chartered to "re-examine environment and development issues and to

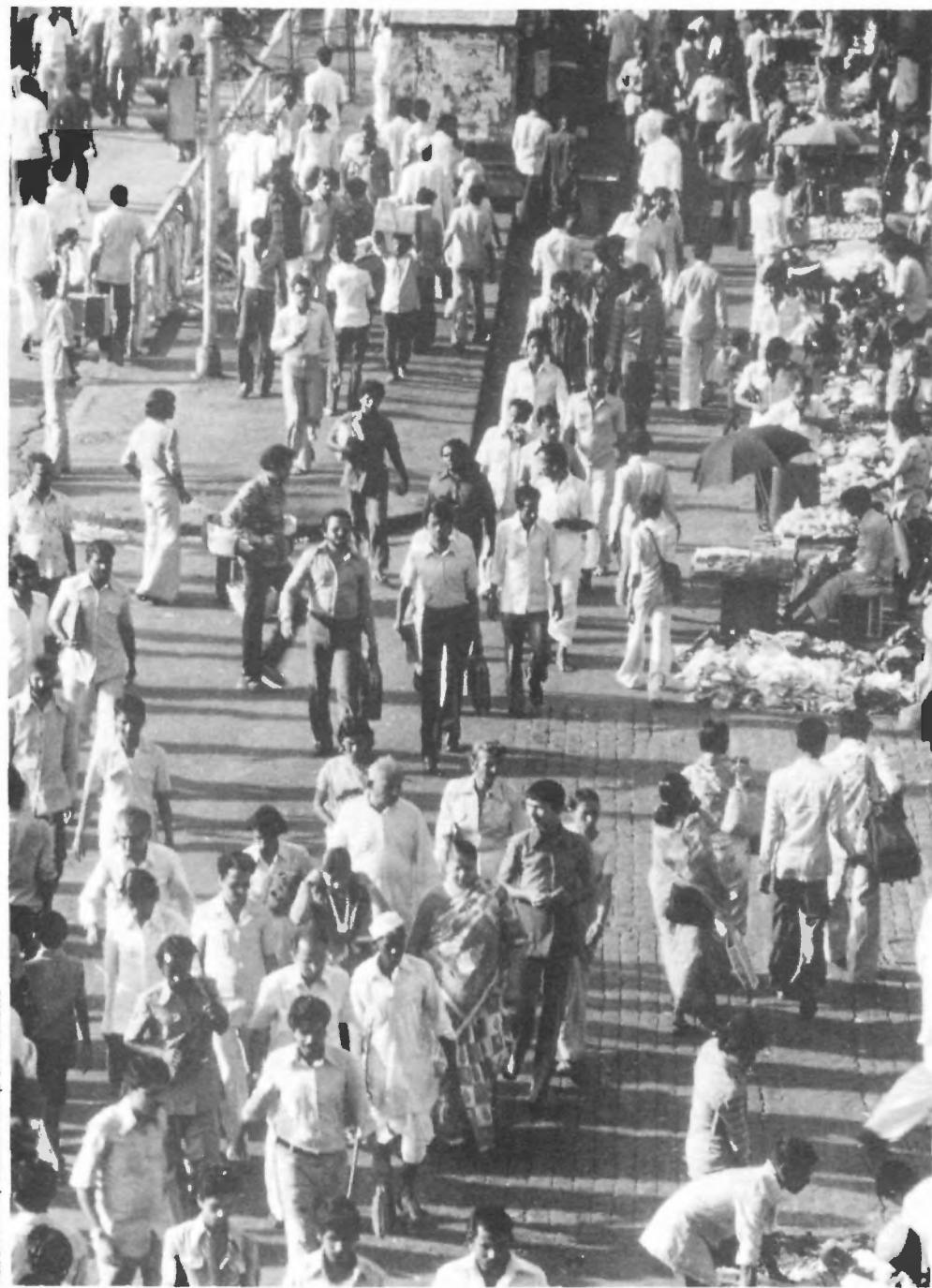
formulate new, concrete proposals to deal with them; to assess and propose new forms of international cooperation that can break out of existing patterns; and to raise the level of understanding and commitment to action everywhere."

To gain perspective on international environment and development issues, the Commission held meetings and public hearings all over the world—including Jakarta, Indonesia; Oslo, Norway; São Paulo, Brazil; and Ottawa, Canada—where thousands of citizens were able to express their concerns. In addition, internationally known scientists, academics, planners, and high government officials were enlisted to prepare a total of 75 detailed reports for the Commission. The findings and recommendations of the Commission are presented in its April 1987 report, *Our Common Future*.

As the following excerpts from the overview of *Our Common Future* indicate, the Commission's findings underscore the mutual interdependence of environmental problems and economic development issues. Based on these findings, the Commission concluded in the report that the world is faced with the challenge to preserve its environment and yet continue to maintain the technological and economic growth necessary to sustain the human population. In actuality, the two concerns, ecological and economic, are not separate but rather are contingent upon each other:

There are environmental trends that threaten to radically alter the planet, that threaten the lives of many species upon it, including the human species. Each year, another six million hectares of productive dryland turns into worthless desert. Over three decades, this would amount to an area roughly as large as Saudi Arabia. More than 11 million hectares of forests are destroyed yearly, and this, over three decades, would equal an area about the size of India. Much of this forest is converted to low-grade farmland unable to support the farmers who settle it. In Europe, acid precipitation kills forests and lakes and damages the artistic and architectural heritage

Robert French, Woodfin Camp & Associates



Rush-hour crowds in Victoria Station in Bombay, India. According to the World Commission on Environment and Development, the world's increasing population is an issue involving not just numbers of people "but how those numbers relate to available resources."

of nations; it may have acidified vast tracts of soil beyond reasonable hope of repair. The burning of fossil fuels puts into the atmosphere carbon dioxide, which is causing gradual global warming. This "greenhouse" effect may, by early next century, have increased average global temperatures enough to shift agricultural production areas, raise sea levels to flood coastal cities, and disrupt national economies. Other industrial gases threaten to deplete the planet's protective ozone shield to such an extent that the number of human and animal cancers would rise sharply and the oceans' food chain would be disrupted. Industry and agriculture put toxic substances into the human food chain and into underground water tables beyond reach of cleansing.

There has been a growing realization in national governments and multilateral institutions that it is impossible to separate economic development issues from environmental issues; many forms of development erode the environmental resources upon which they must be based, and environmental degradation can undermine economic development. Poverty is a major cause and effect of global environmental problems. It is therefore futile to attempt to deal with environmental problems without a broader perspective that encompasses the factors underlying world poverty and international inequality.

Taking its analysis a step further, the Commission points out a circular pattern in which heedless economic development can bring about

devastating environmental effects, and environmental degradation may then further intensify economic pressures.

Impoverishing the local resource base can impoverish wider areas: Deforestation by highland farmers causes flooding on lowland farms; factory pollution robs local fishermen of their catch. Such grim local cycles now operate nationally and regionally. Dryland degradation sends environmental refugees in their millions across national borders. Deforestation in Latin America and Asia is causing more floods, and more destructive floods in downhill, downstream nations. Acid precipitation and nuclear fallout have spread across the borders of Europe. Similar phenomena are emerging on a global scale, such as global warming and loss of ozone. Internationally traded hazardous



Trees chopped in two in order to supply livestock with leaves are a common sight in the Sahel, an area of sub-Saharan countries in Africa. Such practices make recovery of the land difficult. According to the World Commission on Environment and Development, "Each year, another 6 million hectares of productive dryland turns into worthless desert."

Mrs. Gro Harlem Brundtland, Prime Minister of Norway, chairs the World Commission on Environment and Development.

chemicals entering foods are themselves internationally traded. In the next century, the environmental pressure causing population movements may increase sharply, while barriers to that movement may be even firmer than they are now.

The report further elaborates:

The recent crisis in Africa best and most tragically illustrates the ways in which economics and ecology can interact destructively and trip into disaster. Triggered by drought, its real causes lie deeper. They are to be found in part in national policies that gave too little attention, too late, to the needs of smallholder agriculture and to the threats posed by rapidly rising populations. Their roots extend also to a global economic system that takes more out of a poor continent than it puts in. Debts that they cannot pay force African nations relying on commodity sales to overuse their fragile soils, thus turning good land into desert. Trade barriers in the wealthy nations—and in many developing ones—make it hard for Africans to sell their goods for reasonable returns, putting yet more pressure on ecological systems.

To break out of this destructive pattern, the Commission recommends that both developing and industrial nations pursue "a new development path...that sustain[s] human progress not just in a few places for a few years, but for the entire planet into the distant future." This theme of "sustainable development" is central to Our Common Future, and is reflected in the Commission's specific recommendations concerning major environmental and economic problems around the world:

Loss of Species:

The planet's species are under stress. There is a growing scientific consensus that species are disappearing at rates never before witnessed on the planet, although there is also controversy over those rates and the risks that they entail. Yet there is still time to halt this process...The diversity of species is necessary for the normal functioning of ecosystems and the biosphere as a whole. The genetic material in wild species contributes billions of dollars yearly to the world economy in the form of improved crop species,

new drugs and medicines, and raw materials for industry. But utility aside, there are also moral, ethical, cultural, aesthetic, and purely scientific reasons for conserving wild beings.

Population Growth:

In many parts of the world, the population is growing at rates that cannot be sustained by available environmental resources, at rates that are outstripping any reasonable expectations of improvements in housing, health care, food security, or energy supplies... The issue is not just numbers of people, but how those numbers relate to available resources. Thus the "population problem" must be dealt with in part by efforts to eliminate mass poverty, in order to assure more equitable access to resources, and by education to improve human potential to manage those resources.

Food Production:

Growth in world cereal production has steadily outstripped world population growth. Yet each year there are more people in the world who do not get enough food. Global agriculture has the potential to grow enough food for all, but food is often not available where it is needed... Food security requires attention to questions of distribution, since hunger often arises from lack of purchasing power rather than lack of available food. It can be furthered by land reforms and by policies to protect vulnerable subsistence farmers, pastoralists, and the landless...

Urbanization:

By the turn of the century, almost half of humanity will live in cities; the world of the 21st century will be a largely urban world... Between 1985 and the year 2000, Third World cities could grow by another three-quarters of a billion people. This suggests that the developing world must, over the next few years, increase by 65% its capacity to produce and maintain its urban infrastructure, services, and shelter merely to maintain today's often extremely inadequate

conditions. Few city governments in the developing world have the power, resources, and trained personnel to provide their rapidly growing populations with the land, services, and facilities needed for an adequate human life: clean water, sanitation, schools, and transport... Many cities in industrial countries also face problems—deteriorating infrastructure, environmental degradation, inner-city decay, and neighborhood collapse.

Energy:

A safe and sustainable energy pathway is crucial to sustainable development; we have not yet found it. Rates of increase in energy use have been declining. However, the industrialization, agricultural development, and rapidly growing populations of developing nations will need much more energy. Today the average person in an industrial market economy uses 80 times as much energy as someone in sub-Saharan Africa. Thus any realistic global energy scenario must provide for substantially increased primary energy use by developing countries... Energy efficiency can only buy time for the world to develop "low-energy paths" based on renewable resources, which should form the foundation of the global energy structure during the 21st century. Most of these sources are currently problematic, but given innovative development, they could supply the same amount of primary energy the planet now consumes.

Industry:

Experience in the industrialized nations has proved that anti-pollution technology has been cost-effective in terms of health, property, and environmental damage avoided, and that it has made many industries more profitable by making them more resource-efficient. While economic growth has continued, the consumption of raw materials has held steady or even declined, and new technologies offer further efficiencies... Emerging technologies offer the promise of

higher productivity, increased efficiency, and decreased pollution, but many bring risks of new toxic chemicals and wastes and of major accidents of a type and scale beyond present coping mechanisms. There is an urgent need for tighter controls over the export of hazardous industrial and agricultural chemicals. Present controls over the dumping of hazardous wastes should be tightened.

Despite the dire circumstances on which it reports, the Commission does not feel that the time is too late to institute new approaches to solve common problems.

Our Common Future is an urgent call for recognition of the global causes and consequences of these problems and for action involving all nations to begin reversing destructive economic and environmental trends around the world:

Developing countries face the obvious life-threatening challenges of desertification, deforestation, and pollution, and endure most of the poverty associated with environmental degradation. The entire family of nations would suffer from the disappearance of rain forests in the tropics, the loss of plant and animal species, and changes in rainfall patterns. Industrial nations face the life-threatening challenges of toxic chemicals, toxic wastes, and acidification. All nations may suffer from the releases by industrialized countries of carbon dioxide and of gases that react with the ozone layer, and from any future war fought with the nuclear arsenals controlled by those nations. All nations will have a role to play in changing trends, and in righting an international economic system that increases rather than decreases inequality, that increases rather than decreases numbers of poor and hungry. □

(Schmitz is a writer/editor with the Office of Solid Waste who has been on detail to EPA Journal.)

U.S. Reaction

The United States Council on Environmental Quality (CEQ) has issued a generally favorable statement in response to *Our Common Future*, the report of the World Commission on Environment and Development. The CEQ's statement is briefly excerpted below:

There are many elements in the report reflecting principles, positions, and actions which the United States has embraced and to which it adheres. Examples include the central theme of sustainable development, which will preserve and enhance environmental quality in the long term; the emphasis on economic growth, especially in less-developed nations, as a means of enhancing the environment by attacking poverty which is often at the root of environmental degradation; and the need to integrate environmental considerations into economic decisions at the local, national, and international level. □

A Commentary

by William D. Ruckelshaus

Two crucial aspects of *Our Common Future*, the report of the World Commission on Environment and Development (WCED), set it apart from previous studies of global economic and environmental problems. Perhaps the most important is that it is the first such report to reflect a consensus among representatives of widely diverse peoples of the world on a fundamental conclusion: that protection of the environment and the natural resource base of the world is inextricably linked with sustained economic growth.

Secondly, unlike previous studies, the proposals of this Commission must be acted on by the United Nations. The member nations need not agree with the conclusions of the report, but they cannot ignore them.

Over the three-year life of the Commission, I was continually struck by the forcefulness with which those

representing the "development" side of the equation insisted that economic growth is the key to a healthier environment. It became clear to us all that economic growth is essential for the protection of the environment and the maintenance of our natural resource base. In the poor countries, better management and more technical assistance is needed. In the U.S. and other industrialized nations, energy, agriculture, and other policies must be examined for changes that will bring about development with less damage to the environment and less drain on precious resources.

The Commission urges more cooperation between the public and private sectors in the industrialized world as well as within the developing countries. The confrontations of the past

two decades have brought us far in our cleanup efforts but now action is stalled in many areas. Sustaining our resources for now and for future generations requires a new era of cooperation among government, industry, and the private interest groups. The challenge is to work together for "our common future."

We anticipate that the impact of the Commission's findings and recommendations—which the UN is required to act on—should have a significant effect on how countries throughout the world integrate environmental planning and management into sustained economic development. □

(Ruckelshaus, a former Administrator of EPA, is a member of the World Commission on Environment and Development.)

AID's Dollars: Reaching for a Better Environment

by Norman Cohen

There is much at stake for the environment in the developing world. Tropical forests—centered in the Third World—are home to half of Earth's plants and animals. Regions that once were rich forestland have been razed for human settlement. Millions of lives hang in the balance in Africa, depending on the climate and management of natural resources. And, as the Third World's population continues to boom, the pressure of humanity versus the environment becomes even more critical.

Through its worldwide foreign aid programs, the U.S. Agency for International Development (USAID) is helping to ensure that humanity's growth does not upset nature's delicate balance.

The natural tension between growth and the environment gave rise to the U.N. Conference on the Human Environment at Stockholm in 1972. USAID was one of the first donor agencies to adopt procedures that make environmental concerns a key part of designing and carrying out development projects.

In 1977, this concern was made the law of the land when the Foreign Assistance Act was amended to add "environment and natural resources" to USAID's mandate. "The environment is a vital part of the development process," says former USAID Administrator Peter McPherson. "We're proud of the Agency's achievements in integrating environmental concerns into development."

USAID takes its commitment to the environmental integrity of its projects

seriously, with practical results. Just one example: the Agency's experts found that a rural development project in Costa Rica was too close for comfort to an ecologically important wetland. The area is home to many endangered species: the jaguar, ocelot, tapir, paca, and jabiru stork, whose eight-foot wing span makes it the largest stork in the world.

USAID made its support for the development project conditional on the Cano Negro site being made a wildlife reserve. The government of Costa Rica agreed. Today, USAID helps maintain the site as an enclave for exotic creatures.

One of the most pressing environmental problems in the world today is the destruction of tropical moist forests, which cover only about seven percent of the Earth's face but are an important part of its ecology. Deforestation currently claims about 80,000 square kilometers of forest each year, which either are converted to agriculture or fall victim to excessive burning, grazing, fuelwood gathering, or industrial exploitation.

As many as one million species—up to one-fifth of the planet's total—could perish along with the forests by the year 2000. It is tragic to note that many varieties of plants and animals could disappear without ever being discovered by humans.

The value of some of the endangered resources is already known: the camu-camu fruit from the jungles of Peru has 10 times the vitamin C of an orange, the periwinkle plant found in Madagascar is a source of treatment

In Nepal, the U.S. Agency for International Development is developing alternative sources of wood not only to thwart deforestation but also to protect the habitat of the one-horned rhino. Villagers have stripped much of the area's forests, resulting in a decline in the rhino population.



for Hodgkin's disease and lymphocytic leukemia, and drugs for treating malaria and glaucoma originated in the tropical Amazon. USAID has set out to help save these and other valuable resources from the ravages of mismanaged growth. The Agency has worked with experts in and out of government to draw up a strategy for conserving biological diversity.

Recognizing the precious assets that are at risk in the Third World, USAID is helping nations grow with their environment, not against it. For instance, a vine in Peru produces a seed that, when dried, burns with a clear blue flame; it could be an efficient substitute for kerosene and charcoal. Researchers in that country also have discovered a tree species whose bark contains a substance regarded as a promising treatment for some forms of cancer.

Central America was once blanketed with thick forests; today, less than one-half of the area is forested. One response has been USAID's Fuelwood and Alternative Energy Sources project based in Costa Rica that has identified fast-growing trees that can be planted specifically to provide a ready source of fuel. Trials conducted throughout that region have identified 30 promising tree species now being adopted by farmers.

Haiti has been particularly hard hit by deforestation. USAID is working through private groups in an effort to plant millions of trees in that island nation.

The United States is encouraging some farmers to plant and carefully harvest trees as a cash crop on their own land rather than tearing down natural forest areas. One creative program is providing Haitian farmers with plants that bear marketable fruits, such as avocado. "A farmer won't cut down a tree that makes money," says Sean Finnegan, who works on a U.S.-funded effort. "This project helps the farmer, saves the tree, and helps prevent hillside erosion."

USAID's largest forestry effort is underway in Asia. "Projects in Thailand, the Philippines, Indonesia, and Nepal are seeking to establish systems of upland management that reduce environmental damage and incorporate sustainable agricultural practices," says Robert Ichord Jr. of the Agency's Bureau for Asia and Near East.

As in developed countries, many of the environmental risks in the Third World are manmade. For example, the

pressure to increase agricultural yields has made pesticide use a common practice. "It is not surprising that world pesticide sales grew from \$8 billion in 1972 to almost \$13 billion in 1983 with the most rapid growth occurring in

One of the more unusual challenges of preserving the ecological balance and diversity of the Earth is protecting endangered species.

developing countries," notes Pat Koshel, energy and environment policy advisor at USAID.

The Agency is cooperating with the World Bank in an effort to educate people in the safe use of pesticides. Two years ago, these organizations developed pesticide-use guidelines. USAID is also providing \$6 million to fund an Integrated Pest Management Project based in Costa Rica that will provide training and technical assistance to deal safely with pest problems.

The gas leak in Bhopal, India, that claimed thousands of lives in 1984 was shocking evidence of the dangers of industrial accidents. USAID is working with U.S. corporations to work out a safety-conscious response to such threats. "Through a pilot project begun last year with the New York-based World Environment Center, U.S. industrial experts volunteer to work with petrochemical, chemical, paper, and manufacturing facilities in developing nations to create systems to deal with such emergencies," explains USAID's Steve Lintner.

Through a five-year program known as the International Environment and Development Service that began in 1983, industry volunteers are dispatched to countries to identify environmental problems at the plant level and recommend remedial action. More than 25 American companies have taken part in this program.

The United States has helped dozens of developing countries develop profiles of their environment or natural resources. "Our objective is to enable developing countries to become self-reliant in identifying and solving their environmental problems," says Nyle Brady, USAID's senior assistant administrator for Science and Technology.

In Honduras, a U.S.-supported environmental profile was put to good use in drafting a plan to halt soil

erosion in a major Choluteca watershed area. Working with experts in Thailand, USAID helped develop a profile that was used in devising a first-of-a-kind, five-year environmental plan in that country, reports Molly Kux of the Agency's Bureau for Science and Technology.

Conservation strategies have been funded in Nepal, Sri Lanka, the Philippines, and Zimbabwe. The Agency takes care to work with home-grown institutions and conservation groups to nurture concern and expertise in these countries.

In Africa, the Environmental Training and Management (ETMA) project is helping 14 nations recognize the need for careful environmental management. ETMA has supported national conferences in Kenya on water supply and pollution control. The project has also provided advice and leadership in maintaining the water quality of Lake Victoria, the world's second largest lake, bounded by five African countries.

One of the more unusual challenges of preserving the ecological balance and diversity of the Earth is protecting endangered species. USAID is cooperating with the Smithsonian Institution in Nepal in programs to protect the one-horned rhino and the wild Asiatic buffalo.

The habitat of the one-horned rhino—on the foothills of the Himalayas—has been threatened by human settlement. Villagers have stripped much of the gallery forests for firewood, fodder, and thatching. As a result, the rhino population has dwindled. USAID is helping to bolster the rhino population and is developing alternative sources of wood to stave off deforestation.

The wild Asiatic water buffalo exists in Nepal and India. USAID is helping to devise better ways to manage and maintain the endangered herds.

The protection of the environment and the wise and sustainable use of natural resources are fundamental to human survival, says McPherson. "These simple facts have become increasingly apparent in the last decade. In the years ahead, USAID will play a key role in the effort to apply human knowledge to make economic development a process that not only sustains but enriches the Earth's natural heritage." □

(Cohen is environmental coordinator for the U.S. Agency for International Development.)

A Nuclear Power Plant Accident: Would We Be Prepared?

by Miles Kahn



Miles Kahn
Monitoring for radiation during a simulated nuclear "accident" last June near the Commonwealth Edison power plant at Zion, Illinois, are, from left: Shirley Duran, from EPA's Office of Radiation Programs in Las Vegas, and Thomas Horton, who is with the radiation office's Montgomery, Alabama, facility.

What would happen if a significant radiological accident occurred at a nuclear power plant in the United States? Would the federal government, including EPA, be prepared? Would emergency plans fall smoothly into place? Would everyone know what to do?

These are not just idle questions; not only do we have the examples of Three Mile Island and Chernobyl to concern us, but the U.S. Nuclear Regulatory Commission has estimated that there is a 50-50 chance of a major nuclear accident occurring in the United States by the year 2000. Finding the answer to these questions has become a necessity, and an EPA team recently participated in a major exercise to do just that.

Under the general coordination of the Federal Emergency Management Agency (FEMA), the Commonwealth Edison nuclear power plant in Zion, Illinois, last June "hosted" some 800 participants in the federal response to a simulated nuclear accident. Designed to test the implementation of the Federal Radiological Emergency Response Plan, the 3-day exercise involved personnel from most of the major federal agencies, the states of Illinois and Wisconsin, the Zion plant, and about 50 foreign observers. EPA participants included staff from the Office of Radiation Programs (ORP) in Washington, D.C., Las Vegas, and Montgomery, Alabama; from the Agency's laboratory in Las Vegas,

from EPA Regions 5 and 9; and from the public affairs offices in Washington, D.C., and Region 5. The exercise was scripted to presume worst-case scenarios in all technical aspects, with over 120 "controllers" simulating media representatives, Congressmen, irate citizens, and other likely players in such an incident.

Official federal participation began on Day 2 of the exercise, which coincided with Day 2 of the "accident." Most of the EPA contingent was dispatched to the two main installations handling the federal response effort: the Monitoring and Assessment Center and the Response Center. Agency representatives were also assigned to the nerve center of the entire operation, the Emergency Operations Facility, and to the Joint Public Information Center. Because of its unique capabilities, EPA's primary responsibility during a nuclear emergency is to coordinate and support offsite radiological monitoring. Consequently, most of the EPA personnel and equipment were assigned to the Monitoring and Assessment Center, headed by a Department of Energy (DOE) representative. The EPA Field Response Manager, Chick Phillips, served as deputy. These roles would later be reversed as the situation evolved from emergency response to long-term environmental monitoring. In other words, when the situation stabilizes, EPA takes the lead.

The primary function of the Monitoring Center was to coordinate the gathering and analysis of offsite monitoring data from several hundred points. Although these points had been predetermined, monitoring teams were dispatched to them by EPA coordinators in response to requests from state personnel, reacting to constantly changing weather conditions and radiological conditions at the "damaged" reactor. This meant that

Since the Zion "accident" involved the simulated evacuation of approximately 138,000 residents in two states, there was a lot to deal with.

over the two days of monitoring activity, assignments were constantly juggled to meet changing conditions, as the 10 field teams, consisting mainly of EPA personnel using sophisticated equipment, collected soil and water samples, took measurements, and radioed data back to the monitoring center coordinators.

The field measurement data were then forwarded to the Dose Assessment group for analysis, while water and soil samples were brought in to the Monitoring and Assessment Center for analysis in EPA's mobile laboratory, driven up from the ORP facility in Montgomery, Alabama. "If this had been real," Phillips said, "we would have also brought up our mobile communications van from ORP's Montgomery facility and our laboratory/communications van from our Las Vegas facility." In all, EPA personnel coordinated approximately 190 separate field measurements, some of which extended into the neighboring state of Wisconsin. Since the accident was only a simulation, these measurements were taken over a two-day period during hours extended slightly beyond a normal work day. In a real accident, Phillips noted, measurements would be taken 24 hours a day until the emergency phase was over and long-term monitoring began under EPA leadership.

Although most of the EPA resources were assigned to the Monitoring and Assessment Center and were employed in the technical aspects of the federal response, the Agency also played an important part in responding to the more human aspects of the "accident." Throughout the two days of federal participation, which equated to Days two through 10 of the "emergency," three EPA Region 5 staffers were assigned to full-time duty at the Federal Response Center, which was headed by FEMA. Whereas the Monitoring and

Assessment Center was responsible for developing response options based on data analysis, the role of the Response Center was to determine the feasibility of selected options and how to deal with their consequences. Since the Zion "accident" involved the simulated evacuation of approximately 138,000 residents in two states, there was a lot to deal with. In addition to EPA and other major federal agencies (including the Department of Housing and Urban Development, Department of the Interior, FBI, Food and Drug Administration, Federal Aviation Administration, Department of Health and Human Services, and the Corps of Engineers), the Response Center also had representatives from the utility and major volunteer organizations such as the Red Cross.

Some of the problems this group had to deal with were fairly involved, requiring a good deal of coordination among state and other federal agencies. Early in the exercise, for example, the EPA desk received a call from a Wisconsin brewer located in one of the zones designated for sheltering residents, not for evacuation. The brewer wanted to know about possible contamination of the local water supply and when he could safely resume brewing. In addition, he wanted to know about compensation for lost brewing time due to the "accident." To determine the status of the water supply, Region 5 staff member Larry Jensen and his coworkers checked with Wisconsin environmental personnel and with the EPA staff at the Monitoring and Assessment Center. For answers to questions concerning compensation, the brewer was referred to the American Nuclear Insurers, who were also represented at the Response Center and who, as one might imagine, were rather busy. As a follow-up, the brewer's inquiry was reported to the FDA in case of complications from interstate shipment of the brewer's products.

Another call came from the agent who had rented cars to EPA and FEMA personnel involved in responding to the "emergency." The agent wanted to know if the cars would be contaminated with radiation and what would be done if they were. Jensen assured the agent that the vehicles would be routinely monitored for radioactivity; if elevated levels were detected, the cars would be thoroughly decontaminated.

In addition to providing personnel for the events in Illinois, EPA also supported the exercise from headquarters by assisting in developing dose assessments, dealing with Congressional concerns, addressing public and media inquiries, and coordinating the Washington activities of participating federal agencies. The exercise was a large undertaking, not only for EPA, but for the entire federal establishment. It took a year and a half and approximately \$5 million to plan, plus the expense involved in actual participation by each agency. But the result is an emergency response system designed to avoid most of the chaos that followed the reactor accident at Three Mile Island. Even though all participants acknowledge that a real accident would create totally unforeseen situations, the exercise went well. It did, however, highlight some EPA deficiencies, such as the need for training non-radiation staff who might be called upon to participate in a real emergency and for upgrading the Agency's monitoring and data transmissions network. These items have been addressed in a recent ORP Nuclear Accident Initiative. In summary, though, as Phillips put it, "in the exercise, the Feds as a whole showed that we can adapt and put forth a credible response. I just hope there's never a need." □

(Kahn is a public affairs specialist with the EPA Office of Radiation Programs.)

EPA's Policy on the "Bubble"

by Roy Popkin

Travelers passing the DuPont Company's giant Deepwater chemical plant on the New Jersey Turnpike are often impressed by the facility's mighty panoply of stacks, pipes, and valves. They might be more impressed if they could see the invisible emissions-control "bubble" that covers the plant, allowing it to meet state air quality requirements at the least possible cost.

This "bubble," combined with conventional pollution controls, reduces the amount of volatile organic compounds (VOCs) spewed into the air over southern New Jersey, Delaware, and Pennsylvania to more than 2,000 tons per year below the state's EPA-approved clean air requirements. Under the bubble, emissions at the three largest sources were reduced 99 percent by incinerating them as fuel in the plant's furnaces. Previously installed

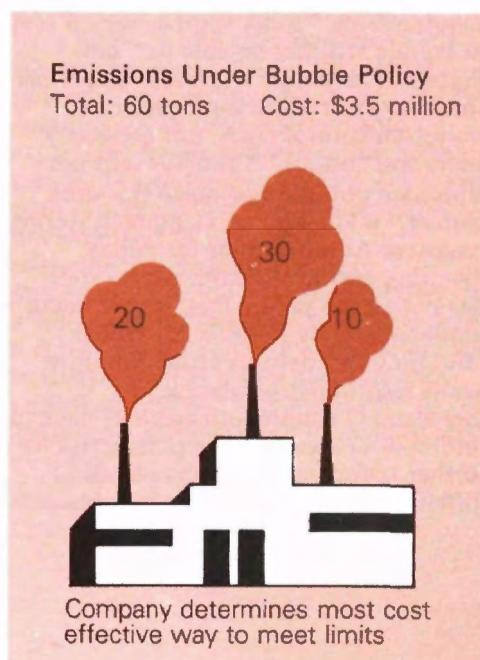
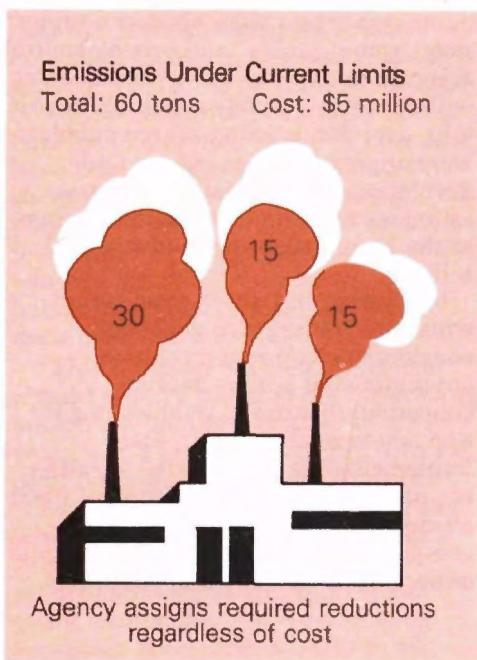
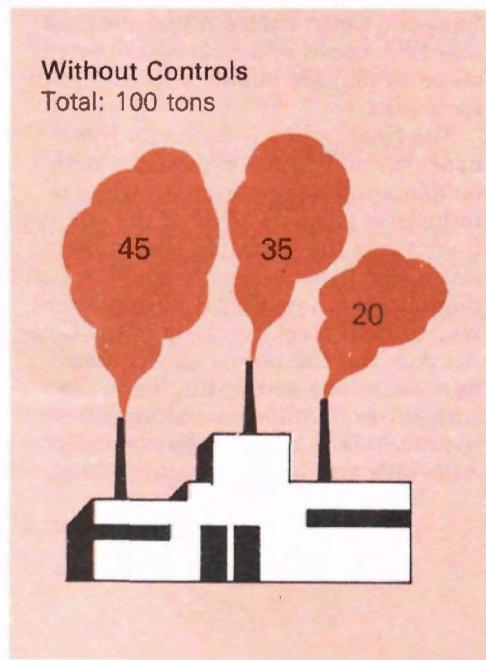
controls on 88 other stacks or vents remained unchanged, while 28 small and difficult-to-control valves were permitted to operate with no controls at all. The combination, however, reduced overall emissions sufficiently to more than meet New Jersey rules calling for an 85 percent overall reduction in the plant's VOC emissions. By using a bubble, DuPont achieved this clean air goal while saving what it estimates as more than \$10 million in capital and annual operating costs.

In nearby Bucks County, PA, a similar "bubble" at USX's Fairless Hills steel plant deals with sulfur dioxide (SO_2) emitted through the plant's smokestacks by the scores of boilers and furnaces used to make steel. The USX bubble is based on use of fuel (oil and natural gas) with a lower sulfur content than would otherwise be required in 94 boilers and furnaces throughout the plant. Credits from these extra SO_2 reductions are used to meet requirements at a number

of combustion units. According to USX, this EPA-approved bubble enabled the company to reduce emissions to or below required levels, while saving about \$15 million over conventional controls obtaining the same results.

And in Bristol, PA, the Minnesota Mining and Manufacturing Company (3M) developed, and EPA approved, a bubble using innovative low-solvent applications to reduce the plant's actual emissions below the level required for conventional controls. Pennsylvania regulations required a 74 percent reduction in VOC emissions from each of 3M's seven tape coaters and three tape treaters at the Bristol facility. Conventional compliance would have required nearly \$9 million worth of control equipment. Instead, 3M replaced a solvent-based coater with one that used no solvents, continued using two existing control devices, and reduced production on the other lines. Actual

EPA's Bubble Policy for Existing Sources



Under the bubble, emissions at the three largest sources were reduced 99 percent by incinerating them as fuel in the plant's furnaces.

emissions levels are now well below those required by the state, with savings estimated by the company in the millions of dollars.

While these bubbles were approved under earlier rules, they indicate the types of benefits EPA hopes to encourage under the emissions trading policy issued last December. Described as "tough but fair" by EPA Assistant Administrator for Air and Radiation J. Craig Potter, the policy sets detailed criteria under which sources may substitute or "trade" inexpensive extra emissions reductions for costly required ones as part of state plans to meet Clean Air Act goals. Developed after seven years of experience with bubbles and other emissions trades, it continues to authorize use of environmentally-sound bubbles as an important component of the nation's effort to achieve and maintain clean air. But it also tightens many past bubble requirements to ensure that bubbles continue to contribute to environmental progress as well as reduced compliance costs.

Under these new, tighter requirements, "some sources which seek to bubble will not be able to," said Potter. "The policy lets states and firms find ways to reduce unnecessary pollution control costs, not necessary pollution control." "Bubbles will not eliminate pollution or make the work perfect," adds John M. Campbell, Acting Assistant Administrator for Policy, Planning and Evaluation, whose staff developed the policy that is now being implemented by Potter's Air Office. "But they can help us climb the three walls traditional regulation is increasingly running up against—lack of information about real opportunities for further reductions from thousands of different industrial sites and processes;

small, difficult-to-regulate sources like body shops and furniture refinishers, which contribute most of the remaining emissions to be controlled in many areas; and increasingly high control costs, which can impede the voluntary cooperation that is necessary to achieve results." EPA has estimated the cost of air pollution control at \$20 billion per year, based only on regulations extant in 1980, Campbell notes. "At that level, even a small percent saving through bubbles can provide powerful extra incentives for sources to reduce emissions, in some cases faster and more effectively than by uniform rules out of Washington or state capitals."

Evolution of the new policy began in 1979 when EPA issued its first bubble guidance to address growing clean air responsibilities and regulatory stalemates. A 1982 Interim Policy enlarged that early effort, integrated the bubble with other incentive-based approaches, and streamlined bubble approval processes. As a result, by January 1, 1986, EPA had approved or proposed approval of 50 bubbles, and numerous others were approved under state "generic rules" authorizing control agencies to approve individual bubbles without review in advance by EPA. All told, over 250 existing-source bubbles were approved, proposed, or under development in 29 states. Industry estimates indicate that lifetime savings to the firms involved could equal \$1 billion.

But during this seven year period, emissions trading also generated considerable controversy. Some environmental groups became concerned that use of bubbles might exacerbate weaknesses in State Implementation Plans (SIPs), creating opportunities for manipulation of plant closings or interpretations of a company's emissions history that could allow hidden increases in emissions.

Others insisted that polluters must meet existing emissions standards for each pollutant at each source, no matter the economic cost. Many sources surpass standard requirements simply by installing conventional emission controls, these groups noted. Without bubbles, any such differences between "allowable" and "actual" emissions were an extra bonus for the environment. But bubbles that would give credit for these differences, thereby allowing other sources to avoid control entirely, could undermine such environmental gains.

Another key issue was use of bubbles in so-called "non-attainment areas" that had not met national ambient standards for healthy air and lacked EPA-approved SIPs for doing so. Without SIPs, it was asserted, no reduction could be deemed "extra" and available for bubble credit, because it was not yet known how many reductions were needed for attainment. Hence bubbles should be severely restricted or disallowed. One key suit touching this issue went to the U.S. Supreme Court before it was decided that EPA could allow non-attainment states to include bubble approaches in their SIPs.

The final policy is based on these concerns and EPA's experience with bubble applications from a variety of industries in many parts of the country. It confirms the principle that allowing states and firms to secure equal or better reductions at less cost is an important way to help meet the goals of the Clean Air Act. But the policy also contains new emissions-accounting and ambient-evaluation procedures which require bubble credit to be consistent with SIPs and health standards in all

Under the new, tighter requirements, "some sources which seek to bubble will not be able to," said Potter.

areas. And in non-attainment areas without plans, the policy requires each bubble trade to produce affirmative environmental progress—substantial overall emission reductions, beyond applicable requirements and without allowing credit for reductions produced by controls installed before an application to bank or trade.

In deciding such threshold issues before release of the new policy, EPA Administrator Lee M. Thomas said these tightenings “will prevent any recurrence of alleged problems with some past bubbles, while strengthening the bubble’s ability to help get us where we need to go.” He also noted that “the bubble is a creative way to supplement and enhance the air management scheme embodied in the statute. While it cannot solve—and should not be asked to solve—all the problems of that scheme, it makes an important contribution in terms of needed flexibility, ability to respond to changing circumstances, and stronger incentives for environmental progress. I am convinced that, taken together, this represents a responsibly balanced package which will strengthen bubbles’ ability to advance environmental progress as well as regulatory flexibility.”

Among other steps the new policy:

- Tightens general requirements for existing-source bubbles, state generic bubble rules, and EPA-approvable state emissions banks (which allow sources to make extra reductions early and store them for future use or sale).
- Requires that bubbles not increase, and in most cases further reduce, any hazardous or potentially hazardous emissions; meet rigorous accounting rules preventing hidden emissions increases; and implement “truth in

trading” by publicly noting all changes in actual and permissible emission levels, so their ambient effects will be clearly known.

- Requires “progress bubbles” in areas which need but lack EPA-approved plans for attaining ambient health standards. These bubbles may not rely on reductions resulting from plant shutdowns, installation of emission controls, or other actions, if these reductions are made before application for trading credit. In addition, they must meet stringent baselines from which to count bubble credit, produce an overall 20 percent reduction in remaining emissions, and be accompanied by written state assurances that they are consistent with the area’s developing cleanup plan.

The new policy also provides that last-minute bubble applications do not impede compliance and enforcement. For example, states may no longer grant compliance extensions for bubbles being processed under generic rules in any non-attainment area. Further, the mere filing of a bubble application does not suspend relevant emission limits or control obligations, although a special provision exists to protect fairness and EPA-state relations in the case of bubbles that appear sound to EPA and have been proposed for approval by states. In addition to this provision, the policy also includes a similar fairness provision for bubble proposals that were pending before EPA under the 1982 bubble policy when the new, final document was issued.

“This policy sets a framework that should remove much of the uncertainty which has impeded trading in recent years,” said Michael H. Levin, director of EPA’s Regulatory Innovations Staff. “Some people may think it’s too tight, while others may think it’s not tight enough. But it’s usable and predictable—states and sources can count on bubbles that meet it being approved. It requires bubbles in all

areas to maintain ambient plans and standards. And in areas that still have health problems, it requires that each bubble make things better than before... The real question was whether constructive new approaches were possible under the Clean Air Act. This policy says the answer is ‘yes.’ We expect to see it widely used as part of upcoming efforts to meet the December 1987 attainment deadlines.”

Says Jack Campbell, “the new policy strengthens and refines EPA’s past efforts to use economics to accelerate environmental progress. Use of bubbles...has been estimated by industry to save the economy hundreds of millions of dollars. Similar approaches are making important contributions to our efforts to phase out lead in gasoline, reduce the use of asbestos, and secure further reductions from various sources under the Clean Water Act. But the air bubble was the first example. The new policy makes it part of routine pollution control—no longer just a grand experiment.”

Adds Craig Potter: “The policy protects the environmental progress we have made, while offering states and sources increased flexibility and the potential for significant cost savings. It contains tough new requirements, especially for areas not meeting health standards and lacking an EPA-approved plan. To the extent that it fosters the development of innovative, cost-effective pollution control strategies, both the environment and the economy will benefit... The policy is not a substitute for necessary regulation. But in dirty-air areas it can make interim contributions, and in all areas it can augment a state’s ability to manage air quality.” □

(Popkin is a writer/editor for the EPA Office of Public Affairs.)

AIR

Radon Problems

EPA released the results of the largest survey of indoor radon done to date that found elevated radon levels in 21 percent of the 11,600 homes tested in 10 states.

The Agency found that the distribution of radon levels varied significantly among the states, and even the states with the lowest distribution or occurrence of radon had some houses with high radon concentrations.

A. James Barnes, EPA Deputy Administrator, said, "These findings indicate that radon may be a problem in virtually every state... It (the survey) reinforces our earlier belief that people who think their homes may have a radon problem should test and take proper actions, if necessary."

The 10 states surveyed were Alabama, Colorado, Connecticut, Kansas, Kentucky, Michigan, Rhode Island, Tennessee, Wisconsin, and Wyoming.

PESTICIDES

Chlordane Agreement

EPA announced that the Velsicol Chemical Corporation has voluntarily agreed to immediately cease the sale of pesticides containing chlordane and heptachlor that are used to control termites while it evaluates several modified application techniques designed to reduce potential chlordane exposure.

The company will not be permitted to sell the termiticides unless it can demonstrate that new application methods can be used without resulting in detectable airborne residue levels inside homes.

If new application techniques permit re-marketing, Velsicol has agreed to the following measures:

- Permanently deleting a number of application techniques.
- Modifying certain termiticide application practices in order to reduce potential human exposure.
- Incorporating a coloring agent into termiticides to help homeowners spot spills or leaks.
- Restricting use of all chlordane and heptachlor products to certified applicators.

WATER

Underground Drinking Water

The Agency is proposing to strengthen its regulations protecting underground sources of drinking water from underground injection of hazardous waste.

EPA estimates that of all hazardous waste disposed, 60 percent goes down injection wells. Over 90 percent of the wells injecting these wastes are operated by the organic chemical, petroleum, and steel industries.

The vast majority of wells being injected are located along the Gulf Coast and Great Lakes, with Texas and Louisiana alone accounting for 70 percent of the injection sites.

This proposal takes the land-disposal regulations already on the books under RCRA and applies them specifically to hazardous-waste injection wells.

Court Ruling on Drinking Water Goals

The U.S. Court of Appeals for the D.C. Circuit has validated EPA's process for establishing Health Goals under the Safe Drinking Water Act. Three lawsuits had been filed against the Agency contesting Recommended Maximum Contaminant Levels (RMCLs, now called Maximum Contaminant Level Goals, MCLGs) for volatile synthetic organic chemicals.

Suits by the American Petroleum Institute and the Chemical Manufacturers' Association challenged the inclusion of certain substances among the regulated chemicals and also challenged EPA's decision to establish RMCLs/MCLGs at zero as an aspirational goal for probable human carcinogens. A Natural Resources Defense Council suit argued that EPA should have set an RMCL/MCLG at zero for vinylidene chloride, a substance that is not considered a probable carcinogen.

The court ruled unanimously that EPA's determinations were well within the bounds of its authorities under the Safe Drinking Water Act. This ruling is particularly significant in that the EPA policy for goals (MCLGs) that was articulated for the eight substances involved has been legally resolved. That approach will be the basis for goals for the remainder of the 83 substances required to be regulated by 1989 under the revised Safe Drinking Water Act requirements.



Dolores Weiss, Agency for International Development

Fishermen in Oman are being educated to avoid overfishing of striped bass as one way to save natural resources from depletion while generating greater profits and a steady income.

Back Cover: Clearing land in Brazil. Although tropical forests are being rapidly lost, efforts are underway to protect this vital resource. See article on page 13. Photo by Stephanie Maze, Woodfin Camp & Associates.

