United States
Environmental Protection
Agency

Office of
Public Awareness (A-107)
Washington, D.C., 20460

Volume 4
Number 6
June 1978

EPA JOURNAL

World Environment

Global Pollution Control

The status of the international environment is the main theme of this issue of EPA Journal. In a report on the state of the world environment Dr. Mostafa K. Tolba, executive director of the United Nations Environment Program, singled out four areas for special attention: chemicals and the environment, malaria, using farm by-products for food, and the conservation of energy. Some of these are subjects of concern to EPA as it deals with environmental problems in this country. In addition to domestic problems, EPA also recognizes that it has a vital stake in international environmental problems. Administrator Douglas M. Costle explains why EPA must be concerned with international activities.

This issue also carries a report on the special effort launched by President Carter to help curb air pollution in Denver. Administrator Costle outlines why the benefits from environmental regulation exceed the costs. Deputy Administrator Barbara Blum calls for a new effort to rescue America's cities from environmental blight. The magazine also carries a review of the Agency's top priorities for fiscal 1979 and 1980. Adlene Harrison, Regional Administrator for EPA's Region 6 with headquarters in Dallas, has provided the latest in a continuing series of articles from EPA's Regional Office around the Nation.

Ruth Brown, Public Interest Constituency Specialist and Coordinator for World Environment Day, assisted in the preparation of this issue.

United States
Environmental Protection
Agency

Office of
Public Awareness (A-107)
Washington, D.C., 20460

Volume 4
Number 6
June 1978

EPA JOURNAL

EPA's Purpose: 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

Articles

Departments

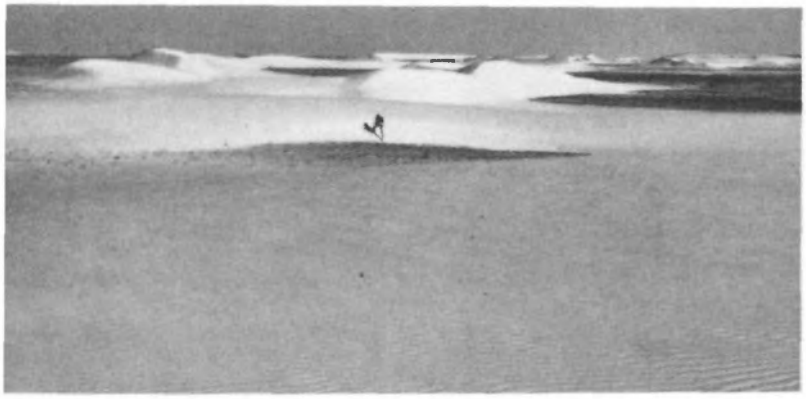
Front cover: Flags of Nations around the world flutter in a breeze at a world exposition ceremony.

Opposite: A Nepalese fisherman casting his net.

Photo credits: Alan Wilson, Ernest Bucci, 4x5 Inc., Charles Freestone/Sentinel Newspapers, World Health Organization, ACTION, the United Nations, World Bank photo by Peter Muncie, Farouk El-Baz/Smithsonian, Elaine Fitzback, Bob W. Smith*, G.Burns*, NOAA * Documerica

Text printed on recycled paper.

The EPA Journal is published monthly, with combined issues July-August and November-December, by the U.S. Environmental Protection Agency. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget. Views expressed by authors do not necessarily reflect EPA policy. Contributions and inquiries should be addressed to the Editor (A-107). Waterside Mall, 401 M St., S.W., Washington, D.C. 20460. No permission necessary to reproduce contents except copyrighted photos and other materials. Subscription: $10.00 a year, $1.00 for single copy, domestic; $12.50 if mailed to a foreign address. No charge to employees. Send check or money order to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.



EPA's International Commitment

By Douglas Costle
Administrator
United States Environmental Protection Agency

As a domestic regulatory agency EPA's primary mission is to protect the environment of the United States. Why, then, should it maintain a vigorous involvement in international activities?

EPA's role in international activities is as old as the Agency itself—older, in one sense. The Presidential Order that created EPA in 1970 detached elements from the Department of Agriculture, Interior, HEW, and the Atomic Energy Commission, detached along with them and gave to the new agency an existing set of international contacts and obligations. We began our institutional life with an array of international commitments. Among them are participation in activities of the International Atomic Energy Agency, the World Health Organization and Pan American Health Organization, its Latin American dependency; and the Food and Agricultural Organization. The responsibilities EPA inherited for joint environmental work with Canada date from the foundation of the International Joint Commission in 1909. The collaboration with Mexico in the International Boundary Waters Commission began in 1944.

One of our most intensive current involvements with other countries lies in the area of toxic chemicals. The international dimensions of the problems in this field are economic, social, and political. Although most of these products are created to serve the world's needs, there are dangers which grow out of the way in which society is organized to develop, produce, market, transport, use, and dispose of them. Decisions affecting any of these aspects are instantly international in scope, with consequences for investment in the chemical industry, for employment, for trade, for agricultural production and for the control of endemic diseases. The U.S. must deal with these problems at every step along the way toward effective management of toxics. The effort necessarily involves all agencies of the U.S. Government that have responsibilities for these interests. It requires the closest cooperation and the most careful coordination. Along with other industrial countries, the United States is determined to master the problems, and we in EPA understand the commitment we are making as we share in this task.

A basic reason for our involvement with other countries, of course, is that pollution problems do not respect frontiers. Our own environment is affected by the actions of our immediate neighbors and by those of countries half a globe away. Shared environmental problems with Mexico and Canada must be attacked jointly, and the pressing need to address the problems of ocean pollution, atmospheric and stratospheric threats and radiation hazards, for example, moves EPA inevitably onto the international scene. I have often remarked that the astronauts' view of the Earth from outer space brings home better than any other means the need for international environmental cooperation. If it is a truism that environmental problems must be viewed on a worldwide and long-range basis, it is also a challenge to our willingness and ability to develop fruitful cooperative relations with those in other countries who are working to protect the environment.

Another reason for our interest in international exchanges is the need to stretch our research dollars. Several countries are producing valuable data of interest to EPA. Some of it is superior to our own because of significant technological advances in particular fields and some of it reflects conditions not easily duplicated in the United States. For example, in the case of serious accidents and the emergency measures taken to cope with threatened or real environmental damage, the circumstances in foreign countries have been unique. By maintaining an active program of cooperation with our counterparts in other countries, directly or in regional and global organizations, EPA benefits from their experiences and obtains research results and technology at a much lower cost than if we were to produce them ourselves.

There are additional reasons for EPA to be concerned with international activities. One source of such responsibilities is that EPA's decisions often have implications for the international relations of the United States. As a regulatory agency, we set standards, guidelines, and procedures that impinge upon the economic and political lives of our neighbors on this planet. Our actions affect international trade and investment, foreign government planning, international lending conditions, foreign agriculture, and indirectly, even such things as employment levels and social and living conditions. EPA is inevitably drawn into discussion with representatives of the countries actually and potentially affected by its actions. Failure to comprehend and anticipate the international consequences of our actions in execution of our largely domestic mandate and to discuss them with the affected countries can produce foreign reactions which create impediments to fulfillment of that mandate.

Finally, EPA must share with other government agencies the task of implementing environmental aspects of science and technology agreements entered into by the United States. Because no specific funding is provided, the Agency must accept the costs of participation within its budget. Most of these agreements are drawn up to serve the broadest foreign policy interests of the Nation—lessening of international tensions by widening and deepening contacts and dialogues, making good on U.S. commitments to north-south technology transfer and providing inducements to other countries to make decisions and take postures favorable to our economic, political, or strategic interests. Oil prices, arms limitations moderation of extremism—all are influenced by these kinds of agreements.

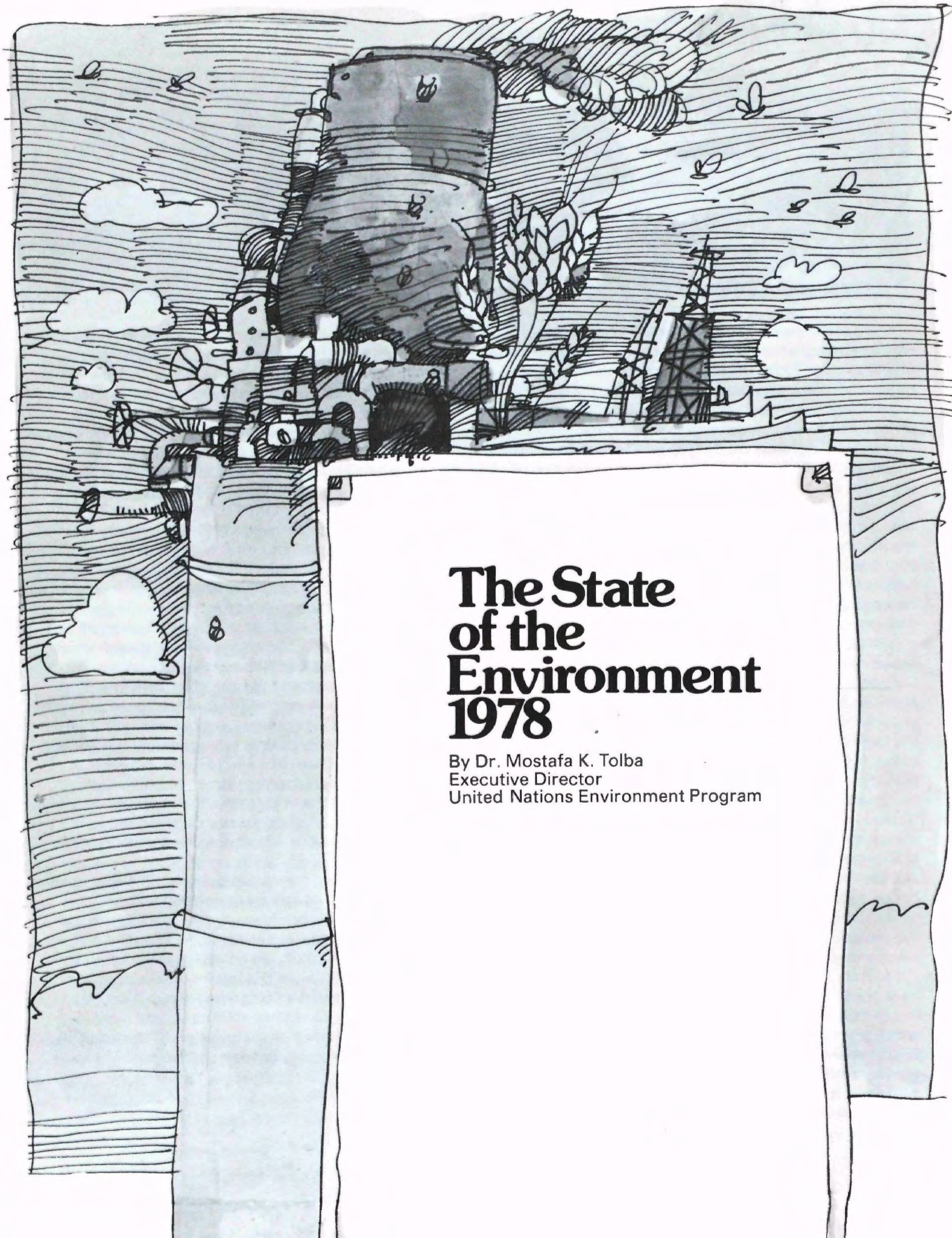
Several of EPA's greatest international obligations have arisen from these science and technology agreements or from the separate environmental agreements which are a part of the overall U.S. cooperative effort. Environmental cooperation is an especially attractive area for furthering the purposes of these foreign policy initiatives. It brings into the international exchanges scientific and technical people, and their institutions, in an area of endeavor that is of unquestioned interest and importance. It opens up channels of international communication in a new sector of society and brings together professional people, American and foreign, who would not otherwise have occasion to meet and share knowledge, plans, and efforts.

If these are the general measures of EPA's international commitments and the main reasons for our involvements, what should the goals of our participation be?

First we must keep our eyes on the Agency's basic mandate—protection of the Nation's environment. We are primarily a regulatory and enforcement agency concerned with pollution control. The international projection of that essential mission means that we must give first attention to the environmental problems within our borders. We must work, plan, and discuss jointly with these neighbors our attack on transboundary pollution. We are concerned not only with Mexican and Canadian sources of pollution of the U.S. environment, but with the effects our own industrial and agricultural activities have on those countries. As the most populous and industrialized of the three, we have an important impact on the quality of their environment. The government, under the Clean Water and Clean Air Acts, as amended, is expected to take action to prevent pollution generated in the U.S. from affecting other countries. The legislation thus adds a formal requirement to our determination to work with them to solve our common problems.

Second, and also in direct support of EPA's mandate, are our international actions to control or reduce pollution of the global commons. Actions on oil spills and vessel discharges, as well as consultations on the standards for transport of oil, are central to our basic responsibilities and to those we share with other agencies of government. The same holds true for our dialogues and joint actions with foreign governments and with international organizations on other facets of marine pollution, on air and water improvement and on radioactive

continued on page 32



The State of the Environment 1978

By Dr. Mostafa K. Tolba
Executive Director
United Nations Environment Program

This year's Annual State of the Environment report for the United Nations Environment Program focuses on four topics of international significance: chemicals and the environment; malaria; the use of agricultural and agro-industrial residues for increasing the base of food production; and the conservation of energy.

The report, which attracts a great deal of public attention each year, is prepared to assist the Governing Council to respond to the General Assembly's 1972 directive that it should "keep under review the world environmental situation in order to ensure that emerging environmental problems of wide international significance receive appropriate and adequate consideration by Governments."

This mandate of the General Assembly covers a broad spectrum of environmental issues, which were reflected in the first three State of the Environment reports issued in 1974, 1975, and 1976. However, at its fourth session in April, 1976, the Governing Council of UNEP decided that in the future the annual report should be selective in its treatment of subjects and that an analytical, comprehensive assessment of the state of the global environment should be prepared every fifth year. In 1977, therefore, the annual report concentrated only on four topics: the ozone layer, environmental cancer, land loss and soil degradation, and firewood.

The first quinquennial State of the Environment Report will appear in 1982 on the tenth anniversary of the Stockholm Conference, with the theme "Ten Years after Stockholm".

A summary of the subjects treated in the 1978 State of the Environment Report follows:

Chemicals and the Environment

There can be no question that many chemical products have brought great benefits to man and his environment. Others, however, have had extremely harmful effects. The magnitude of the problem can be gauged by recent estimates that about four million chemical substances have been identified so far. Of these, only 30,000 are commercially produced. The remainder are intermediate waste products or laboratory chemicals that do not directly reach the public.

A vast amount of scientific information is available on the short-term effects of the well-known chemicals hazardous to human health, domestic animals, or wild animal species. Chemical substances enter the environment, and man himself, through complex and interrelated paths. Some such as fertilizers, pesticides, and herbicides, are directly applied; others enter the environment from combustion processes; still others are unwanted by-products of industrial processes which are carried into the environment in the air or waste waters, and are sometimes more toxic than the original raw materials. Through chemical transformation a relatively harmless chemical may become a toxic by-product in the environment, and may enter the food chain and accumulate in living organisms.

It is still not known what happens if human beings are exposed to chemicals of very low concentrations over long periods. Research is needed on effects of pharmaceutical products when combined with other chemicals. Some drugs are known to cause cancer. There continues to be much uncertainty over the degree to which antibiotics and hormones used in feeding farm animals represent a health hazard to man. More needs to be known about the possible causal relationships between pesticides and cancer, tumors, and biological mutations. Knowledge about the long-term health effects of food additives is still insufficient. The mechanism and cause of the bioaccumulation of metals in marine organisms are still not understood, as testified by the outbreak of the Minamata disease in Japan as a result of consumption of fish contaminated by mercury. Air, land, and water have become receptors of many metal wastes and gaseous chemicals. A number of the latter can become catalytic agents that penetrate the Earth's atmosphere with harmful effects on the ozone layer that shields living things on Earth from harmful ultraviolet radiation.

The accidental release of some of the products used in manufacturing processes is potentially hazardous. Thus, dioxin released into the atmosphere after the explosion of a chemical plant in Seveso, Italy, in 1976 caused considerable ecological damage and detrimental health effects in the area. About 340 cases of chloracne have been reported among school children exposed to the dioxin.

The control of the release of hazardous wastes into the environment is becoming a major concern to governments. Control requires assessment of toxic wastes and choices among various waste management options, such as waste reduction at the source, treatment procedures, or storage under safe conditions.

Several countries have established mechanisms to control the use of chemicals. Through its global assessment program known as "Earthwatch," and its International Register of Potentially Toxic Chemicals (IRPTC), the United Nations Environment Program encourages and coordinates many activities designed to improve the evaluation of trends and environmental impacts of chemical compounds, particularly long-term effects.

"Malaria, a major threat to health and development, is once more resurgent. Being primarily an environmental and socio-economic problem, it therefore demands environmental and socio-economic solutions."

Malaria—An Environmental Disease

Malaria, a major threat to health and development, is once more resurgent. Being primarily an environmental and socio-economic problem, it therefore demands environmental and socio-economic solutions. Past reliance on narrower strategies is increasingly seen as the reason for the resurgence of this debilitating disease. In 1955, out of a world population of 2.65 billion, 1.07 billion were living in malarious areas. The number of malaria cases at that time was estimated at 200-225 million, and annual deaths from malaria at two million. DDT came into use for combating malaria in 1943 and hopes for complete eradication of malaria were voiced. Chloroquin and related drugs also came into use to kill the malaria parasites in people. But the same properties which made DDT and Chloroquin so successful are at the root of the present resurgence of the disease. Mosquitoes are becoming more and more resistant to DDT and other insecticides, and these same insecticides have contaminated the human environment.

The resurgence of malaria has been most dramatic in India, where the number of reported cases has increased from an all-time low of 40,000 in 1966 to 1,430,000 in 1972 and about 6,000,000 in 1976. Sri Lanka, Pakistan, and African countries south of the Sahara have also reported considerable rises in the disease. Resistance to DDT has often occurred not as a result of its direct use against mosquitoes, but because of its use in spraying agricultural crops. Resistance has often been most apparent in cotton-growing areas, where massive aerial spraying of DDT has been a common practice. Another factor hindering the malaria eradication strategy is the development by the malaria parasite of resistance to Chloroquin and related drugs. The extensive use of insecticides has also resulted in a number of undesirable effects in the human environment. The progressive contamination of virtually all global ecosystems with DDT and other chlorinated hydrocarbons is now well-known, with traces present in rainfall and soil, and in organisms.

These difficulties facing malaria control programs have accelerated efforts to find alternative approaches. More attention is being given to integrated, environmentally sound methods of control, with less dependence on insecticides. In 1975, UNEP and the World Health Organization jointly held a meeting at Lima, Peru, and discussed a variety of these approaches. One such approach known as "habitat management" involves the modification of the aquatic habitats where mosquitoes breed. Another approach is biological, using other organisms to limit mosquito numbers. At least 265 species of fish that feed on mosquito larvae have been tried in more than 40 countries. Another variety of biological control involves the use of microbes and other parasitic disease agents to attack malaria-carrying mosquitoes.

The most frequently discussed requirement for a solution to the malaria problem is a vaccine against the *Plasmodium* species that causes malaria. The development of such a vaccine has been hindered principally by the lack of a suitable source of parasites from which it could be prepared, but progress recently has been made in this respect.

The rational approach to malaria control appears to be effective and ecologically sound measures against larval forms and their breeding habitats, controlled application of insecticides against adult vectors, and safe chemotherapy. The success of such a program depends heavily on the support of the people affected, and community motivation is therefore essential. Correct land and water management for fish farming, forestry, agriculture, and other practices in relation to changing human behavior and life-styles is also a relevant factor deserving long-term attention in malaria control.

Using Farm By-Products for Food

Despite unprecedented increases in food production during the past two decades, famines of enormous scale threaten in the years ahead as populations continue to grow and the gap widens between rich and poor countries, and between rich and poor people.

Current world food yield could nourish everyone alive today. The total calorie and protein content of today's food production is more than twice the minimum requirement of the world population. Hunger and malnutrition today stem chiefly from inadequate distribution of resources and know-how. Accurate figures of the distribution of hunger and malnutrition are, however, difficult to provide. In one study, approximately 500 million people, one eighth of the world's population, are said to live at nutritional levels below minimum acceptable standards. In another study 40 percent of the world population is said to be suffering from some form of undernourishment.

The residues of harvesting processes are enormous. Wheat, with a yearly crop production of 355 million tons, rice with 344 million tons, corn (maize) with 332 million tons, sorghum with 55 million tons, millet with 36 million tons, and several other less widely grown grain crops all contribute to a grand annual total of 1,700 million tons of cereal straw, much of which is at present regarded as waste.

Agro-industries also produce vast quantities of residue. The sugar cane industry, for example, creates each year 50 million tons of residue (bagasse), as well as molasses and press mud. There are many other examples of underutilized agricultural and agro-industrial residues. Discharged in excess into the environment, these residues can poison the soil, kill fish, cause artificial enrichment (eutrophication) of lakes, pollute rivers and streams, create unpleasant odors, and cause air pollution harmful to human health.

If, instead of being regarded as wastes, such residues were treated as valuable unused raw materials, it would be possible to reduce pollution and other undesirable environmental impacts and to increase the base for food production itself. In solid, liquid or slurry form, agricultural and agro-industrial residues are usually organic and biodegradable, and hence can be transformed by biological, chemical, and physical processes into energy, animal feed, food, organic fertilizers and other beneficial uses.

In India, China, the Philippines, and other countries, thousands of small biogas generation plants have been built in rural areas. The gas produced in the course of anaerobic digestion of animal and agricultural residues is burned as a domestic fuel, thus reducing the demand on other energy sources. At the same time, the gas plants produce a slurry extremely rich in nutrients and largely free of disease-carrying organisms. It can be applied directly to the land, tipped into fishponds as fertilizer, or mixed with domestic refuse or other organic debris to form a compost.

Opportunities to recycle and use the agricultural and agro-industrial residues are enormous, and limited only by lack of incentives and of appropriate research and development. Meat production residue, both edible and non-edible, can often be converted into useful products. Rice bran contains about 15-20 percent oil, vitamin B, amino acids, and other nutrients. The oil in the rice bran can be used as animal feed. Rice straw can be converted into paper products and animal feeds.

More research is needed to develop appropriate and environmentally sound technologies for residue-utilization, and to establish social costs and benefits of residue-utilization. It may even be technologically feasible within a decade or more to supply food by means of a single-cell protein.

The discharge of residues into the environment has proved to be a costly process, and recycling and utilization of residues has recently been seen as a matter of public interest. The use of agricultural and agro-industrial residues offers considerable promise. But the result must be a usable product at an economical cost, and the procedures used must not result in greater environmental or social problems than the methods of residue disposal they replace.

Physician examining children in Thailand for enlarged spleen, a symptom of malaria

Energy Conservation

Energy is an essential ingredient in meeting basic human needs, in stimulating and supporting economic growth, and in raising standards of living throughout the world. There has been an increasing global reliance on fossil fuels as a major source of energy since the industrial revolution, and particularly in this century. It has become abundantly obvious that fossil fuel resources are finite and should be regarded as vanishing assets. This has spurred a re-examination of energy policies in many countries, with special emphasis on the conservation of energy. It is estimated that more than half of the energy put into daily use, in transport, industry, agriculture, in households and other consumer sectors, is wasted by inefficient technology and by wasteful lifestyles.

Energy conservation is mainly directed at obtaining more work per unit of fuel consumed. There are many possibilities for substantial conservation of energy. Most goods could be manufactured and made to work more efficiently. Many energy-saving measures have been adopted recently by various countries, including fiscal measures, regulations and standards, encouragement of public transportation, total energy systems, public education and research and development. Apart from the question of what sources of energy to develop tomorrow, energy conservation must be confronted today.

Proper management of energy resources everywhere requires major policy decisions at the highest political levels for the simple reason that energy consumption is the product of innumerable decisions made by countless energy users, large and small. Entering into such decisions are a host of economic factors such as incomes, costs, investments, and taxes. Energy consumption also depends on technologies and on efficiencies of energy use, on climate and geography, on social patterns and norms, on government regulations, on environmental priorities and requirements, and on perceptions of the role that energy plays in human affairs.

Much usable energy is currently thrown away. Enormous energy savings can be achieved if the optimum level of potential energy is extracted from urban refuse, animal wastes, agricultural residues, and forest-product wastes; if the millions of tons of scrap metal are recycled, standardized returnable bottles substituted for most cans and unnecessary packaging eliminated.

In many developing countries much of the energy consumed is from resources that have not so far been accounted for in most international statistics, such as firewood, cow dung, and agricultural wastes. The commonly held axiom that "only the affluent can afford conservation" is thoroughly discredited by an examination of what has recently been called "the other energy crisis: firewood."

Proper management of energy resources is essential in the poor countries because of energy's importance in domestic life, agriculture, the creation of productive jobs, and the balancing of trade with other nations. Just as in the industrialized countries, there are significant environmental benefits associated with energy conservation, as well as economic benefits. The additional benefits of preserving social options by reducing dependence on certain sources of energy cannot be minimized. Through the application of appropriate technologies. firewood, animal and agricultural wastes can be used more efficiently to meet energy needs in rural areas. Modifications of stoves can, for example, significantly increase the efficiency of firewood use.

Energy conservation will permit the avoidance of, or minimal reliance on, doubtful energy sources while the search for safe, sustainable sources continues. It also decreases the likelihood that the climatological threshold (for example, with carbon dioxide production, or with regional heat generation) will be crossed, triggering consequences that may be devastating. Energy conservation will help reduce environmental degradation and stretch further the Earth's limited resources. □

The above article is an excerpt from Dr. Tolba's State of the Environment Report for UNEP. Copies of the report may be obtained by writing to UNEP Information Office, Rm. 3610, United Nations, 866 UN Plaza, New York, New York 10017.

Global Environmental Monitoring

By Noel Brown

GEMS, the Global Environmental Monitoring System coordinated through the Program Activity Centre (PAC) of the United Nations Environmental Program, was set up to respond to the need for sound information on harmful substances and trends in the environment.

"Earthwatch" was the overall term used at the U.N. Conference on the Human Environment at Stockholm in 1972 for global environmental assessment, which has since been a basic responsibility of UNEP. In addition to the systematic process of obtaining data, Earthwatch is concerned with research, which focuses on additional data as needed; information exchange, which facilitates wide use of data; an analytic review process, which identifies problems and gaps in knowledge; and evaluation, which interprets data for the guidance of decisionmakers.

GEMS is a global network of monitoring systems, executed by governments, United Nations agencies, and other bodies. Its purpose is to establish the means of identifying trends and changes brought about in global and regional environments by human action. In land use, for example, GEMS is active in monitoring soils and vegetation cover. UNEP is collaborating with the Food and Agriculture Organization and the United Nations Educational, Scientific, and Cultural Organization on work leading to a global assessment of soil degradation. Another area where monitoring is extremely important is natural tropical forests. These forests are being cut down at an alarming rate, and many countries are extremely concerned about it.

There is one major problem that applies to all monitoring systems, within countries as well as among them globally, and that is the problem of comparability. If monitoring efforts in various localities or countries do not provide comparable data, the end result is numbers that do not mean anything. One of the main concerns of GEMS in relation to pollutant monitoring is to make sure that countries are collaborating in the intercalibration of instruments so that the results can be compared with one another. Even developed countries like the United States are faced with this problem within their own land—that of getting internal jurisdictions to measure variables in the same way.

Another problem, which applies particularly to the Landsat technology, is that of equipment, particularly in the developing countries. At present there are two Landsat satellites in orbit, and only one of the four tape recorders in these satellites is working. This means that only a limited amount of data can be recorded, and the data itself has to be beamed down to receiving stations. In addition, at present, there is only one operational receiving station in a developing country, that is in Brazil, although more are being planned in Africa and Asia. However, Landsat C was launched March 5 with an improved system and the Landsat D system will be launched in 12 to 18 months' time.

Another major problem is the enormous lead time required to assess regional and global problems. Global problems have been systematically looked at for only four to five years. At the same time, some very significant results have been obtained through the World Meteorological Organization's system of baseline stations that have been looking at carbon dioxide trends in the atmosphere. The Mauna Loa station in Hawaii, for example, has produced definitive data on such levels in the atmosphere and has shown that such levels are rising—a matter of major concern for world climate.

The Program Activity Centre basically has two roles: (1) coordinating between national and international projects: and (2) serving as a catalyst. For example, by providing a small amount of financial support ("seed money"), UNEP encourages the development of new monitoring activities through United Nations specialized agencies. Both the above roles are being fulfilled by groups of government experts who examine closely related monitoring activities and advise on ways to integrate, and if necessary expand these activities.

At a meeting of governments in Nairobi in 1974, GEMS was given a number of institutional recommendations. These were:

- Inter-governmental cooperation in monitoring should build on existing national and international systems to the maximum extent possible;
- United Nations specialized agencies should be used to the maximum possible extent for coordinating and implementing monitoring programs;
- Priority should be given to development of global and regional (multi-national) monitoring;
- Monitoring systems should be designed to meet clearly-defined objectives, and arrangements for the evaluation of the data should be an integral part of the design of the systems.

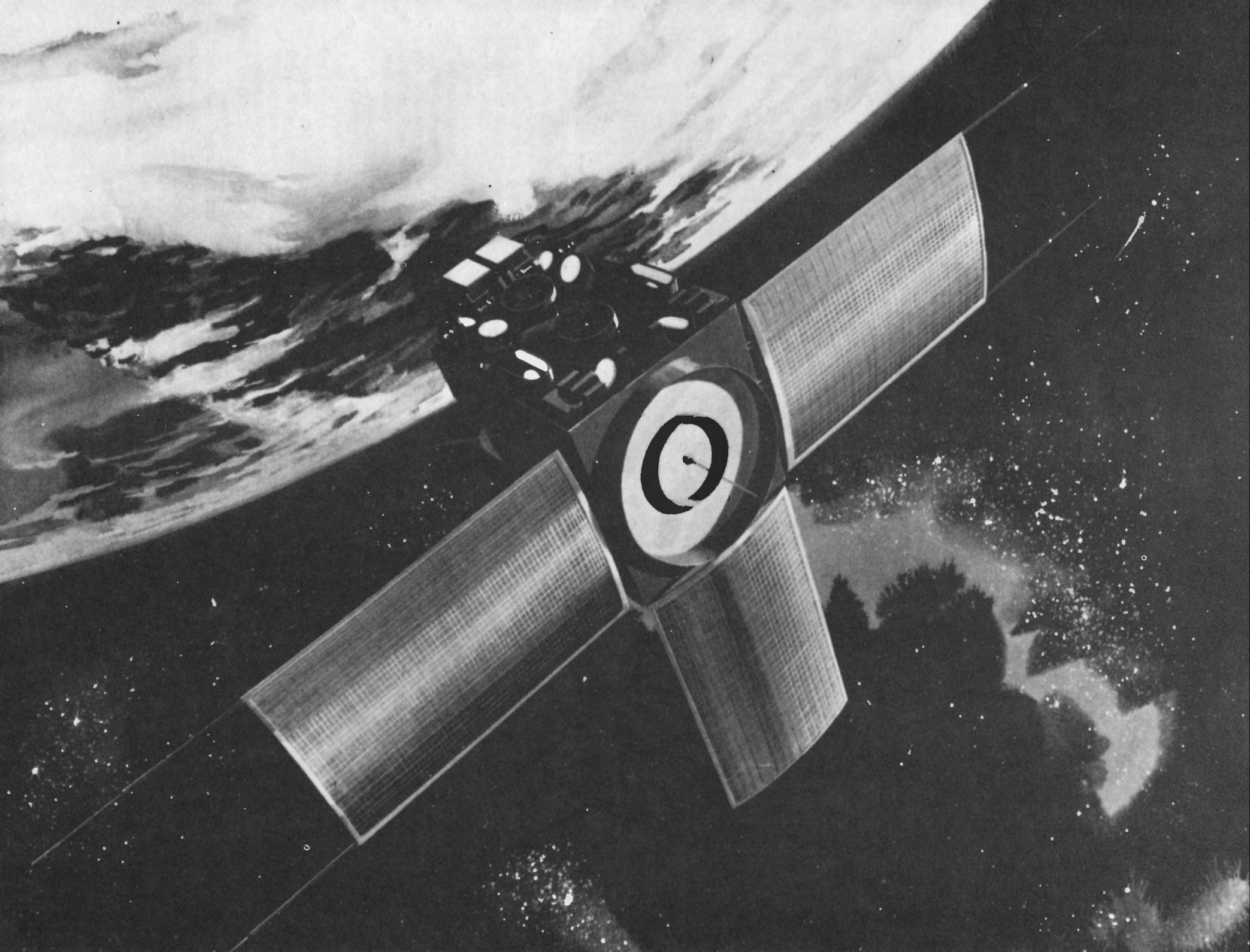
At the same meeting GEMS was also given a set of program goals, a tentative list of priority pollutants, and a number of suggestions regarding natural resource or ecological monitoring, the monitoring of factors leading to climatic change, and of indicators of health status with particular emphasis on high risk groups.

There has been an important change of emphasis in the GEMS concept since it first took shape. At the time of Stockholm, governments were mainly concerned with pollution and considerably less attention was given to natural resources. Most people have an intuitive understanding of the word "pollution" even though it is not easy to define. However, the ecology of man's natural resources—his main food crops and resources such as forests and grasslands—is less understood. After all, sewage discharge is obvious, and so are its main effects, although there may be additional numerous and less obvious side effects. At the same time causes of degradation of soil or plant life

continued on page 40

This NOAA 5 satellite is collecting data that will be beamed to Earth for use in UNEP programs.

Noel Brown is Director of the New York Liaison Office for the United Nations Environmental Program.



International Cooperation Begins at Home

By Alice Brandeis Popkin

Looking at the broad spectrum of international activities EPA engages in to achieve our global objectives, we need to remind ourselves constantly that environmental protection begins at home. In this case, "home" means working with our closest neighbors, Canada and Mexico, to solve pollution problems along our borders.

Americans deal with Canada and Mexico on practical environmental issues on many levels. No problem is too small. The citizens of tiny Derby Line, Vermont (pop. 800) have a serious sanitation problem. Through EPA and State Department they seek approval for U.S. funding to expand a sewage treatment facility in Rock Island, Quebec, for the use of both municipalities. The prognosis for a solution is good.

Larger border cities like San Diego-Tijuana, Detroit-Windsor, and El Paso-Juarez share numerous air and water pollution problems. For example, El Paso and Texas State officials are working with EPA to find better ways to deal with the problems of air pollution emanating from Mexico. The citizens of Windsor, Ontario, similarly have sought—and obtained—relief from air pollution in the Detroit area.

On the national level, the U.S.-Canadian International Joint Commission works continuously to monitor or develop solutions to pollution problems. The Commission, or "IJC" as it is called, is a mixed Canadian-American body empowered by the two governments to look into specific environmental or other boundary waters problems (the Garrison diversion project in North Dakota is a recent example). The IJC's recommendations to governments, while not legally binding, are seldom thwarted or ignored. On the Mexican side, we have the International Boundary Waters Commission (IBWC). While its functions differ somewhat from those of the IJC, we are seeking to give it a broader environmental focus.

All of these activities, at the local, State, and national levels, illustrate the practical, problem-solving activities which go on daily along our borders—and which I believe are as important as any of the work our Agency does internationally. They are important not only because they set a good example for other nations. More to the point, when we successfully resolve an air or water pollution problem with Ottawa or Mexico City, we also help achieve U.S. environmental objectives of direct, practical benefit to Americans. That is why we in the Office of International Activities assign a high priority to relations with our closest neighbors.

It is not always an easy process. Even though the issues involve many of the same difficulties we experience domestically, they are frequently complicated by questions of national sovereignty. I want to turn now, first, to spell out briefly some of these difficulties and, second, to outline how we in EPA headquarters, working with other agencies and our Regional Offices, deal with Canadian and Mexican problems.

Major Problem Areas

In the past, most U.S. transboundary pollution problems were concerned with shared water resources—at first with use and quantity, and more recently with quality. Our first major water agreement with Canada, the Boundary Waters Treaty, was signed in 1909. Its emphasis is on joint use, but Article IV, probably the first environmental clause in any international treaty, also commits each party not to pollute the other.

In 1972, the U.S. and Canada adopted the Great Lakes Water Quality Agreement, to define more precisely objectives and national commitments on each side for the massive task of cleaning up the five Lakes, constituting 97 per cent of the Nation's fresh water storage. This agreement, now being revised and strengthened, was recently described by an enthusiastic Canadian official as "the greatest attempt ever made by mankind to reverse a major case of environmental abuse." It is true, of course, that much has to be accomplished. Since 1972, the U.S. has funded more than $5 billion to expand municipal sewage treatment in the Great Lakes Basin. Canada has spent nearly one-third of that amount. The IJC reports that the earlier degradation of Lake Erie has been halted, but much more, including control of industrial pollution, toxic substances, and phosphorus, remains to be done.

On our southern flank, the U.S.-Mexican Water Treaty of 1944 originally was aimed at resolving water quantity problems along the two major transboundary rivers, the Colorado and Rio Grande. Over time, preoccupation with equitable use of these waters has given way to concerns over water quality.

By and large, then, we have institutions and procedures for dealing with both countries on problems of water pollution, however imperfectly. Unfortunately, we do not yet have such "handles" for solving air pollution problems. Over the years, as industrial development has spread into transfrontier areas, each of the three countries has experienced air pollution problems with its neighbor.

Canada, and to a lesser degree Mexico, have tended to view themselves less as perpetrator than victim of air pollution. Certainly the greater degree of industrialization in the U.S. would suggest this. In this vein, the Canadian government has expressed concern over pollution generally from the U.S., and more specifically about the potential air quality impacts of the U.S. conversion to coal for power generation. This position, however, glosses over two factors which make our neighbors equally if not more potent sources of transboundary pollution. First, in Canada, much of its industrial, power and resource development is concentrated along the U.S. border (the Canadian "sun belt"). Along the Mexican border, a similar situation obtains: Northern Mexico's population centers, often for economic reasons, are concentrated nearly opposite large U.S. cities, such as El Paso and San Diego, leading to several

Alice Brandeis Popkin is Associate Administrator for International Activities.

severe air quality problems. To illustrate the difficulties we have in grappling with these problems, I want to turn now to the second major set of differences of environmental practices in the three countries.

Philosophical and Political Differences

Pollution control problems among the U.S., Canada, and Mexico are directly traceable to differences in governmental philosophy and the legal/political systems found in the three countries. U.S. laws require the use of best available control or treatment technologies, as well as control of source location, to achieve air and water quality objectives. The philosophy of minimum treatment and emission control at the source is becoming well-established in our regulatory practice.

Canadian Federal authorities, while sharing many U.S. environmental objectives, have little control over pollution, which Canada's constitutional system entrusts largely to its Provinces. This means that the U.S. must cope with two separate political jurisdictions when seeking redress on specific problems. For example, in recent negotiations over pollution controls on the Atikokan generating station just north of Minnesota's Boundary Waters Canoe Area, the U.S. confronts not Canadian Federal but Ontario Provincial regulations and practices. A similar situation exists with the Poplar River generating plant north of Montana which comes under Saskatchewan's jurisdiction. It takes little imagination to picture the complexity and unpredictability of bargaining in these circumstances.

Under the Mexican political system, the Federal Government has greater control—in theory—over air and water pollution in the States on its side of the U.S. border. Here the problem is not so much systemic as economic and social. The grinding poverty of northern Mexico, with population growth outrunning job opportunities and social services, forces both State and Federal authorities to concentrate scarce revenues on creating jobs, providing minimal housing and so on. While Mexican authorities at both the local and national level avidly seek to cooperate with the U.S. on environmental matters, the necessary organization, trained manpower and resources are not yet available for the rapid strides that need to be made to improve the environment in northern Mexico.

Because we live in such intimate contact along our borders, we are obliged to seek ways to bridge these differences with Canada and Mexico. We hope over time that cooperative practices will multiply, erasing our disparities of system or practice, to the mutual benefit of peoples in all three countries.

What We Are Doing to Combat Pollution

As one might suspect, our environmental relations with Canada are highly developed. One reason for this is, simply, money. Canada and the U.S. share some $60 billion annually in trade, of which nearly $20 billion is in automobiles and automotive parts, bought and sold under an integrated automobile marketing agreement. There is a powerful economic incentive, therefore, to adopt similar emission standards for cars and trucks produced in the two countries.

Vast shared water resources, including the Great Lakes, St. Lawrence Seaway system, and numerous transboundary rivers along the 5,100 mile border also furnish a strong rationale for cooperation between Canada and the U.S. in controlling water pollution. Each country has a nearly equal opportunity to pollute the other, as some rivers and streams flow north and others south. Lake Michigan, which lies wholly in U.S. territory, empties into the shared waters of Lake Huron.

As mentioned earlier, the International Joint Commission (IJC) is the major institutional mechanism for bridging bilateral environmental disputes with Canada. To date, the IJC has focused mainly on water quality problems, notably in the Great Lakes, but also in other lakes (e.g. Champlain) and in the Red, Rainy, Souris, Richelieu, St. John, and Niagara rivers, to name a few. The procedure for referring a problem to the IJC is relatively simple in concept, if not in practice. When the governments cannot solve a problem, they negotiate a formal "Reference" to the Commission. The six Commission members (three from each country) then appoint a Board, composed equally of members from each country to study the problem and recommend a solution to the Commission, which in turn reviews the findings, modifies them if it sees fit, and reports its recommendations to the governments.

It is at the board study stage that EPA is most involved. IJC board members often include EPA officials from headquarters, laboratories, or Regional Offices, including Regions 1, 2, 5, 8 and sometimes 10, depending on the location of the problem area. Region 5, in addition, has the Great Lakes National Program Office, set up by EPA to oversee U.S. implementation of the Great Lakes Water Quality Agreement. Other Federal agencies, like Interior and the Corps of Engineers, and U.S. State officials sit on IJC boards. Of particular interest is the requirement that board members, whose duties are in addition to their regular work, serve as *individuals* and are asked not to be bound by agency positions on the issue under study. This procedure helps to make IJC findings more objective, authoritative, and in the end, more acceptable to governments.

Although cumbersome at times, the slow but sure IJC procedures for resolving water pollution problems have not yet proved effective for air issues. While we and Canada have informally agreed to extend the "thou shalt not pollute thy neighbor" provision of Article IV in the 1909 Treaty to include transboundary air pollution, the Canadian government has not yet been able to agree to requests for specific air pollution References to the IJC. The two existing air pollution References, covering Michigan-Ontario air issues and a general transboundary air pollution monitoring mandate, cannot be used to resolve particular point-source problems. These still are being handled directly by the two governments with as yet few positive results. The two current air issues on the Canadian side, Atikokan and Poplar River, are at an impasse over Canadian unwillingness to install sulfur dioxide scrubbers on either of these coal-fired installations. The Poplar River issue also includes water quantity and quality problems. These the Canadians have consented to refer to the IJC. The people of Minnesota and Montana fear that unscrubbed emissions from the two plants will produce long-term, cumulative harmful effects on the U.S. side of the border. We are continuing to press vigorously for better sulfur controls, but as yet without success.

While there are few specific air pollution complaints from Canada regarding U.S. sources, the Canadian government has recently begun to make inquiries into a problem believed to emanate from the fluoride emissions of the Reynolds Metals aluminum smelter along the St. Lawrence River in Massena, New York. A number of cattle on Cornwall Island belonging to the St. Regis Indians are continuing to contract fluorosis, leading to as yet unproven charges that Reynolds is at fault, despite the company's efforts to control plant emissions in recent years. We are planning to discuss this problem with the Canadians when they complete their inquiry and we have an opportunity to verify the facts of the case.

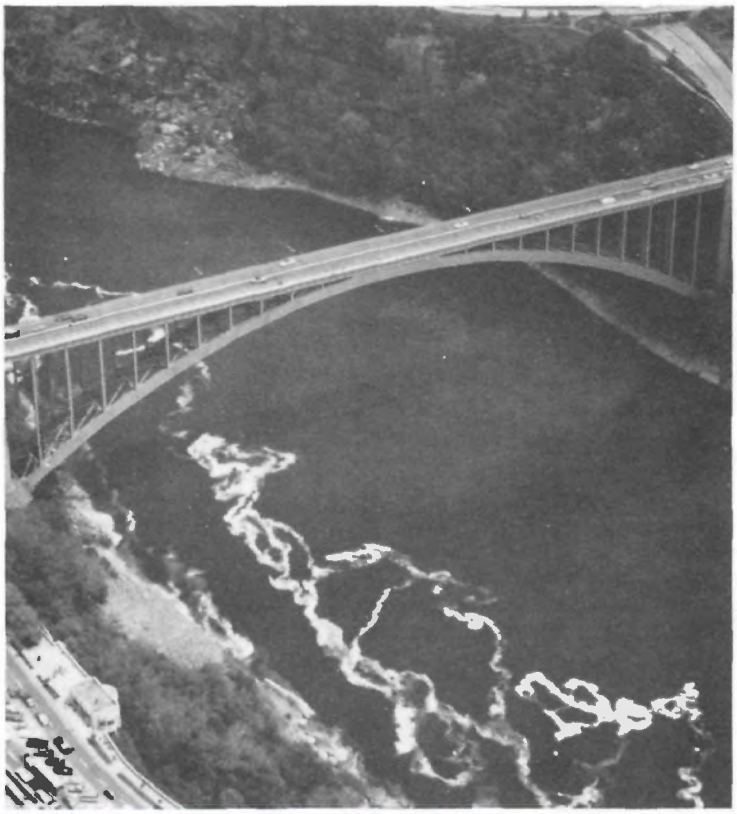
With Mexico, the International Boundary Water Commission (IBWC), a joint U.S.-Mexico Commission, composed of one citizen of each country, set up under the 1944 Waters Treaty, is principally concerned with water quantity. However, increasing water quality problems have spurred the IBWC to become involved with EPA and state water quality experts to solve contentious border issues. The U.S. Commissioner, Joseph Freidkin, has the authority—with his Mexican

counterpart—to supervise deliveries and conservation of water between U.S. and Mexico. Commissioner Freidkin utilizes a Board of Consultants made up of experts in a particular field as dictated by the issue. Types of programs are preservation of fluvial boundaries, flood control, dam construction, sewage treatment plant construction, and water quantity and quality monitoring. A specific problem in the San Diego-Tijuana area has been the channelization of the Tijuana River for flood control. Mexico has completed its portion of the project up to the border and because of environmental concerns the project has been delayed in the U.S. In Mexico channelization was completed using concrete, while in the U.S. the natural river channel is being used with a dissipator to reduce the velocity to normal flows. The U.S. portion will be completed this year. Monitoring of the project will continue.

On February 17, 1977, President Jimmy Carter and President Jose Lopez Portillo met and re-confirmed the special importance of neighborly relationships between the two countries. As a result of these discussions a consultative mechanism, the Social Working Group, was established. Later a Border Environment and Health Subgroup was formed to deal with problems such as water pollution, air pollution, monitoring, solid waste, and various health-related border issues.

Various mechanisms have been utilized to address environmental issues identified by the Subgroup. For instance, in San Diego and Tijuana, local officials, together with EPA, and Federal environmental officials in Mexico, are installing a monitoring system to collect air quality data for the San Diego-Tijuana basin. The results of the monitoring program will be used to establish an international plan for controlling air pollution.

Raw sewage flowing into the U.S. in the San Diego-Tijuana area has been a continuing problem for more than 25 years. The IBWC, together with EPA and other Federal and local agencies, has responded to the problem by arranging for raw sewage from Mexico to be treated in San Diego on an emergency basis. Because of the rapid increase in population in Tijuana, the emergency mechanism has become almost routine and San Diego has indicated that its present system is becoming overloaded. Efforts are now being made to determine what can be done to alleviate the problem.



Rainbow Bridge connects the U.S. and Canada over the shared waters of the Niagara River.

In the El Paso-Juarez area, air pollution has been a considerable problem for both cities. Medical studies of the effects of the American Smelting and Refining Company (ASARCO) operations in El Paso in 1972 confirmed a high concentration of lead in the blood of children living close to the smelters on the U.S. side. In 1974, tests on the Mexican side also indicated elevated blood lead levels in children living near the smelter. Without establishing a causal connection, a judgment from a Texas court in 1972 required ASARCO to provide medical assistance, install control equipment, and pay penalties for violations on the U S. side. Installation of the control equipment is expected to be completed by December 1978. A cooperative study among EPA, the Center for Disease Control, and Mexican officials in El Paso-Juarez is being considered to further evaluate the problem.

In order to deal with these and other environmental problems along the border and to better understand the environmental program of each country, EPA and Mexico's Subsecretary for Environmental Improvement (SMA) in the Ministry of Health are considering a Memorandum of Understanding for cooperation on environmental programs and transboundary problems. It is hoped that through such a practical mechanism, we will be able to expand providing for periodic review by officials at the policy level.

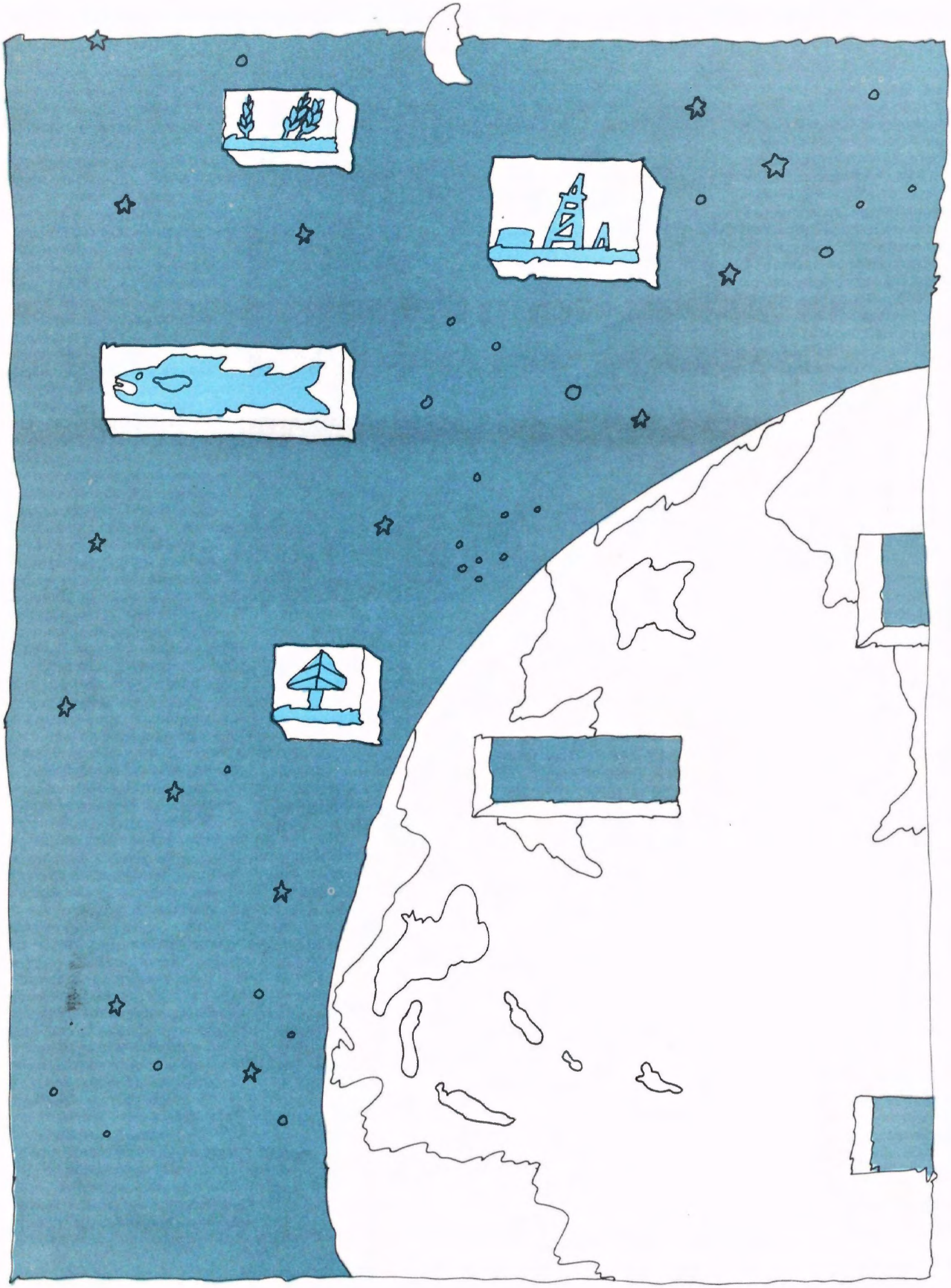
Future Problems

Looking ahead, our transboundary environmental problems can only grow. Not only will water quality and the demand for air pollution controls be of continuing concern, but new issues like toxic substances control, nuclear power development, and hazardous waste disposal will be among the major challenges of the future. The solutions to these problems lie not so much in institutional innovation as in expanding our dialogue at all levels with the governmental entities and people in both countries.

With Canada, our already wide-ranging working relationships and information exchanges among environmental and foreign affairs officials in each country must be continued (and perhaps expanded at the State-Provincial level). The IJC's role may also usefully be expanded in monitoring new functional or regional problems, such as strip mining and logging operations along the boundary.

With Mexico, we should continue our dialogue in the Social Working Group on environmental issues. We need to search for creative new ways to assist and cooperate with the Mexicans (both bilaterally and through such multilateral mechanisms as the Pan American Health Organization) to begin pollution cleanup in the populated areas along the border. And eventually, we might also want to consider some new institutional mechanism—such as revision of the 1944 Boundary Waters Treaty to include environmental concerns—as a way of building on and consolidating our growing cooperation with the Mexicans in this field.

Nowhere else are the environmental problems of such concern or the potential solutions so important to the U.S. as with our neighbors to the north and south. Our cooperation with each can be models for potential environmental relations with two key groups of countries—industrialized (Canada) and Third World (Mexico). If EPA can successfully work with such differing countries, we will learn a great deal in the process, and this will strengthen our efforts to work with other nations on difficult international environmental issues. □



Redefining National Security

By Lester R. Brown

The concern for the security of a nation is undoubtedly as old as the nation-state itself, but only since the Second World War has the concept of "national security" acquired an overwhelmingly military character. Commonly veiled in secrecy, considerations of military threats have become so dominant that other threats to the security of nations have often been ignored. However, as a number of researchers have recently pointed out, present-day threats to national security may arise less from the relationship of nation to nation and more from the relationship of man to nature.

These numerous new threats derive directly or indirectly from the rapidly changing relationship between humanity and the Earth's natural systems and resources. The unfolding stresses in this relationship initially manifest themselves as ecological stresses—food and resource scarcities, and climatic changes. Later they translate into economic stresses—inflation, unemployment, capital scarcity, and monetary instability. Ultimately, they erupt as social unrest and political instability.

National defense establishments are useless against these new threats. Neither bloated military budgets nor highly sophisticated weapons systems can halt the deforestation or solve the firewood crisis now affecting so many Third World countries. Nor can they ameliorate the worsening food shortages or arrest the rise in unemployment levels in some of the same countries.

One of these emerging threats to national security is the progressive depletion of oil reserves. Recently there has been much attention given to the occurrence of short-term supply disruptions in petroleum, but unfortunately strategic planners have lost sight of a far more central fact; namely, that oil reserves are being rapidly depleted and that the downturn in world oil production may be only a decade and a half away. It is the failure to prepare for this eventuality that poses the real threat to the future security of oil-dependent nations.

Efforts to ameliorate the projected downturn in world oil production by turning to other energy sources have produced their own threats to national security. In the case of nuclear power, it has proven impossible to separate the international spread of nuclear power for peaceful purposes from the spread of bomb-grade nuclear materials. The modest contribution of nuclear power to the world's energy supplies cannot compensate for the volatility of a world of present and potential nuclear powers. Coal has also been proclaimed as a potential means of circumventing the impending shortage of energy supplies, but there too is an unfortunate and possibly fatal flaw. A U.S. National Academy of Sciences study recently pointed out that the burning of coal in the quantity necessary would eventually lead to a several-fold increase in atmospheric carbon dioxide and an associated and possibly catastrophic rise in the average global temperature.

With oil wells going dry, nuclear power in limbo, and the heavy use of coal threatening to alter the global climate, the urgency of developing renewable energy sources has become obvious. Circumstances suggest the need for immediate and broadly based efforts to develop the entire range of renewable energy sources, as well as a crash energy conservation program. The rate of transition from petroleum to solar energy sources, the number of solar collectors to be installed each year by a country, the number of windmills to be erected where wind power is economically feasible, and the area of farmland to be devoted to the various energy crops need to be calculated. An all-out conservation program is needed to stretch remaining oil reserves as far as possible and so buy time to shift to renewable energy sources while designing a sustainable and petroleum-free economic system.

The need for all countries of the world to act in concert to formulate and launch a transition program, including devising a timetable, is paramount. Without a concerted global effort, it is inevitable that the economic and political stresses resulting from the coming energy transition will imperil the security of all nations.

A second major threat to the security of modern nations involves the deterioration of biological systems as population continues to expand. Stress is evident in each of the four major biological systems—oceanic fisheries, grasslands, forests, and croplands—on which humanity depends for food and industrial raw materials. In the past it has been assumed that because biological resources are renewable, they are of little concern. In fact, both the nonrenewable and renewable resource bases have been shrinking.

More and more the carrying capacities of biological systems are being ignored and exceeded. The world's fisheries have in the early seventies failed to show the steadily increasing yields that were typical of the fifties and sixties. Forests are shrinking on almost every continent as the cutting of trees exceeds their regenerative capacity. In many Third World countries population growth is now acting as a double-edged sword, simultaneously expanding demands on the biological systems while destroying the resource bases. Encroaching deserts may pose a greater threat to the long-term viability of some countries than invading armies.

The oceanic food chain, yielding some 70 million tons of fish per year, is humanity's principal source of high-quality protein. However, disturbing evidence indicates that the catch in a majority of oceanic fisheries may now exceed the sustainable level. Between 1950 and 1970, fish supplied a steadily expanding share of human protein needs, but in 1970 the trend was abruptly and unexpectedly interrupted. Since then, the catch has fluctuated between 65 and 70 million tons, clouding the prospects for an even bigger catch. Meanwhile,

continued on page 38

Lester Brown is President of Worldwatch Institute, Washington, D.C., and author of the book, The Twenty-Ninth Day: Accommodating Human Needs and Numbers to the Earth's Resources *(New York: W.W. Norton, 1978).*

World Environment Trends

By Albert Wall

Six years ago, the representatives of 113 nations met in Stockholm to establish a plan to deal with the world's burgeoning environmental problems. They also agreed that the international community should mark June 5th—the day the Conference opened—as World Environment Day. On this day every year, the people of the world take stock of what has been accomplished and what still remains to be achieved to save the planet from self-destruction. And in marking World Environment Day in 1978, it is clear that there have been some significant trends and developments that for the most part are encouraging.

Based on the dispatches to *World Environment Report* from correspondents who regularly cover environmental affairs in more than 50 countries, significant trends worldwide have emerged in the last year.

Perhaps the most significant trend has been the formation in many countries, for the first time, of centralized and powerful environment ministries, at the cabinet level, which have consolidated previously fragmented units.

One of the notable examples of this development can be found in the developing Republic of Venezuela, which only a little more than a year ago consolidated all its separate environmental divisions under the aegis of the Ministry of the Environment and Renewable Natural Resources. It is worth noting that its Minister, Sr. Arnoldo Jose Gabaldon, reports directly to the President, and that Sr. Gabaldon commands both military and civil agencies with power to monitor and enforce his ministry's environmental regulations.

Albert Wall is Editor in Chief of World Environment Report.

But such wide-ranging authority, even when bolstered by strict legislation, or the requiring of environmental impact statements (EIS) or assessments, does not necessarily add up to a sinecure. For perhaps the chief problem in attempting to protect and improve the environment as weighed against high cost factors—and this is a special problem in the developing countries (most of which are not as iron-and-oil affluent as Venezuela)—is how to achieve the correct, the balanced, compromise.

But Minister Gabaldon thinks he has found a Solomon-like answer, what he terms the "permissible damage principle." For example, he has said, "We can let some industries pollute certain of our rivers for a given time span if during that period the over-all water plan does not demand a higher quality of water."

On a national, internal level, the virtue of centralization as it obtains in Venezuela (and in Mexico, Sweden, Denmark, West Germany, the Netherlands, U.K., Israel, and, most recently, in Turkey, among others) is self-evident. But there is a secondary, external virtue as well, which is that such a ministry can deal more easily and productively with such international organizations as the UN Environment Program (UNEP).

In sharp contrast to Venezuela and the other cited countries is Argentina, where the lack of a centralized environment ministry was severely criticized last September by Guillermo Cano, former Argentine Secretary of Water Resources, who said: "Now we have the under-secretariat of environmental planning under the secretariat of transportation and public works, the under-secretariat of natural resources and ecology in the secretariat of agriculture, and the national office of public safety under the secretariat of public health."

Similarly, in Greece, the Greek Society for Research and Control of Water, Land, and Air Pollution (ERYEA) last December deplored the lack of a central environment agency.

Fortunately, however, the lack of a centralized environment ministry has not prevented many of the developing countries from making reasonable strides in husbanding their renewable natural resources through the use of alternative forms of energy such as solar, geothermal, bio-gas, wind, and wave. This can be considered as a second emerging trend.

Although technology in solar energy is, as expected, fairly well advanced in the U.S., Western Europe, Australia, and Japan, it is interesting to note that India, a developing country, ranks among the leaders in this field.

Not a technical trend, but nonetheless a third one of broad significance, is the ever-growing international cooperation on regional environmental problems such as shared resources in the Mediterranean, the Caribbean, the Rhine, and the Amazon Basin.

Recently, representatives from 26 countries plus observers from three more states and from a range of UN organizations attended a meeting in Nairobi—their fifth in just over two years—and finally agreed on the remaining five of 15 environmental draft principles of conduct with regard to the conserving and protection of shared natural resources.

The meeting was organized by the UN Environment Program (UNEP), whose Executive Director, Dr. Mostafa K. Tolba, described its outcome as a "major breakthrough in the field of international environmental law."

The fourth in this series of new trends is rather startling. In modern memory, there have, of course, been many private environmental pressure groups ranging from the non-governmental organizations to Nader's Raiders to citizens' protests against the siting of atomic reactors or the felling of giant redwood trees. But more recently we have witnessed the birth of ecological political parties which, rather than merely supporting one or another of the standard political entities, are fielding political candidates under their own banners.

At the forefront of this movement in Europe are the four French eco-political groups. Perhaps foremost among them is Le Mouvement Ecologique (the first such national movement) which abjures alliances with the established French parties. Another eco-political group, Ecologie et Survie, also takes this non-collaborative stance.

But a third French group, Les Amis de la Terre, has, in a sense, cast off from the other two, maintaining that alliances with "regular" political parties are sometimes necessary, even more effective. In turn, the newest ecological party in France, SOS Environment, is also a moderate, flexible group, more devoted to purely conservationist issues than the other three, although it, too, is dead set against the construction of nuclear reactors of any kind.

Known as the "green ones," these ecologic candidates received roughly 10 percent of the French Parliamentary "first" balloting in March of 1977. In the last election, however, they could only muster slightly over two percent, perhaps because the combined vote for all leftist parties was significantly short of pre-election forecasts.

But eco-politics are not confined solely to individual nations like France and Great Britain. Late last year, representatives of such movements from seven EEC countries met in Paris and agreed to subscribe to a manifesto issued earlier in Brussels by the European Environment Bureau, calling for "One Europe, One Environment." They also agreed to wage a vigorous campaign in the next elections for the European Parliament, under the slogan "Europe Ecology."

If these new trends spread and gather momentum elsewhere in the world, substantial environmental progress can be expected. □

US-USSR Environmental Agreement

By Pierre Shostal

On a chilly November day, two Soviet scientists stood on the banks of the Connecticut River and took notes. They were starting work on a study of planning methods used on the Connecticut Valley Basin. Two months later, on an even colder day, three American specialists began similar work on the Severskiy-Donets River Basin in the Soviet Union. When completed, their activities will increase knowledge of this complex subject for scientists in both countries and could lead to improvements in the way such work is conducted.

A mountaintop in Soviet Georgia will be the scene this summer of a joint experiment involving U.S. and Soviet scientists. Their task will be to study the formation and transformation of natural aerosols. Because high altitude pine forests emit natural aerosols which are exposed to direct solar radiation, this site offers favorable conditions for increasing our understanding of the role of aerosol formation in air pollution.

These activities form part of the work being done under the U.S.-U.S.S.R. Environmental Agreement. At the Sixth Joint Committee Meeting, held in November, 1977, in Washington, D.C., the Chairman of the U.S. delegation, EPA Administrator Douglas M. Costle, his Soviet counterpart, Academician Yuriy Izrael, and 45 other delegates met to discuss progress of projects carried out during the past year under the Agreement. In addition, they planned new activities under these projects for the following year. During the November, 1976-November, 1977 period, approximately 100 working group meetings, symposia, visits of specialists on a whole range of problems, joint research cruises, experiments, and exchanges of individual specialists took place regarding the 11 major areas of the Agreement.

Pierre Shostal is Executive Secretary of the U.S.-U.S.S.R. Environmental Agreement.

Visiting Soviet scientists observe phytoplankton sampling techniques used by Ohio State University students on a boat in the Great Lakes.

These major areas are:

- air pollution
- water pollution
- environmental protection associated with agricultural production
- enhancement of the urban environment
- preservation of nature and the organization of preserves;
- marine pollution
- biological and genetic consequences of environmental pollution
- influence of environmental changes on climate
- earthquake prediction
- arctic and subarctic ecological systems
- Legal and administrative measures for protecting environmental quality.

The Agreement now encompasses 41 projects and involves other Federal agencies besides EPA. Included are Agriculture, Interior, Coast Guard, Commerce, Housing and Urban Development, Transportation, Health, Education and Welfare, National Oceanic and Atmospheric Administration, U.S. Geological Survey, and the Council on Environmental Quality. Universities, private business firms, and various citizens' interest groups also participate.

In his opening remarks to the Joint Committee Meeting, U.S. Chairman Costle said: "In looking at the U.S.-U.S.S.R. Environmental Agreement shortly after its fifth birthday, I believe it is basically a healthy organism. The renewal of the Agreement by the two sides was, in my view, a recognition that we agree on this point. There have been substantial achievements over the past five years, and this progress encourages me to think that we will be able in many areas to move from the stage of exploration of each other's capabilities and resources to more concrete work programs from which practical results will emerge."

What are the benefits to our country of cooperating with the Soviet Union on the environment? Our specialists have learned a great deal in certain areas where the Soviets have considerable resources and experience. For example, we have studied Soviet ozone treatment technology for municipal and industrial waste water; we have for the first time had access to historical climatic data from Siberia; we have transferred from the U.S.S.R. breeding populations of Siberian cranes and Siberian steppe polecats; we have done much joint work in earthquake and tsunami prediction; we have performed mutually beneficial work on stationary source air pollution.

In some areas, the Soviets are less advanced than the United States. Nevertheless, Soviet investment in environmental protection is growing at an impressive rate and environmental concerns are playing an increasing role in economic policies. For example, Soviet officials recently told American visitors that decisions on the long talked about plans for diversion of major rivers were being delayed to permit time for full study of the environmental consequences of such actions.

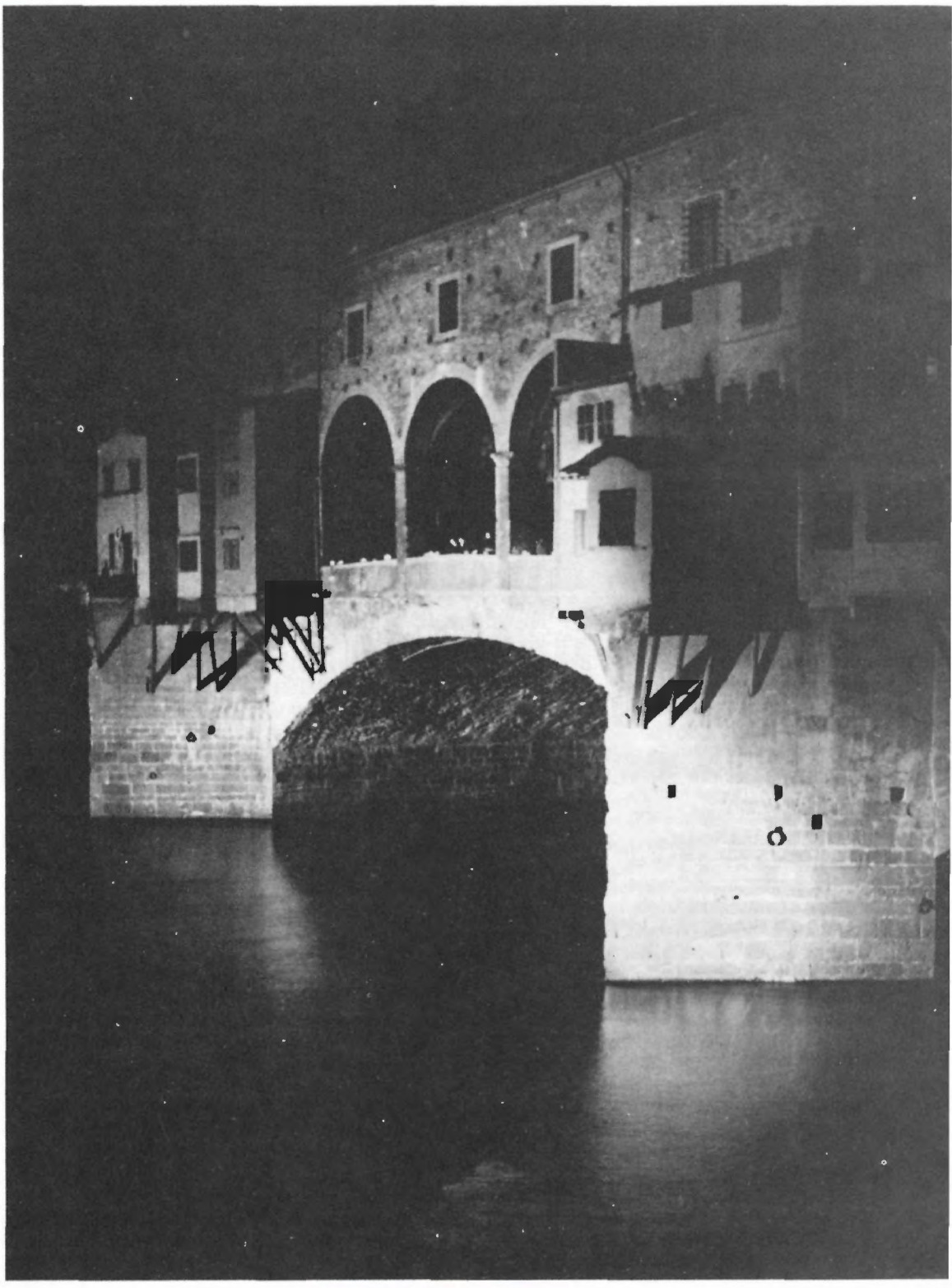
This observation suggests that encouraging a growing sophistication of Soviet decision-makers and scientists about environmental problems and solutions should be an important U.S. aim. What the Soviet Union—as the world's second industrial power—does within its territory (which covers 1/6 of the Earth's land area) will have an impact around the globe, including our own country.

Just a few weeks ago, the U.S.S.R. created the State Committee for Hydrometeorology and Control of the National Environment. This body will reportedly be responsible for coordinating environmental protection measures in the Soviet Union and is thus potentially a very significant actor on the environmental scene. The creation of this State Committee is evidence of the growing Soviet commitment to environmental protection.

continued on page 40

Devilish Heritage

By Mary Witherspoon



The Arno River in quieter moments flows under the Ponte Vecchio in Florence, Italy

In November 3 and 4, 1333, the Arno river collapsed the arches of three bridges, leaving their pilings standing naked, supporting nothing. It battered two medieval gates to shreds and poured itself full force into the piazzas of Florence. On November 3 and 4 of 1844, the Arno again went rampaging, pouring cataracts of muddy water through two gates (this time left open), forcing sewers to regurgitate, creating havoc in the historic center of the city.

Contemporary Florentines paid little mind to these old stories until after the flood of 1966. The deluge that came on November 3 and 4 of that year was so disastrous and so uncannily like its ancient predecessors that the old chronicles have been unearthed, reprinted and called as witnesses. Some superstitious people are now saying that these days, November 3 and 4, belong to the devil.

The damage caused by the 1966 flood was certainly of devilish proportions. Twelve square miles (700 streets) were flooded, giving the city 66 million cubic yards of water mixed with fuel oil and half a million tons of mud. Human casualties were relatively light, but aesthetic and historic losses were astounding. Arno water invaded museums, churches, archives and libraries, palaces, convents, and cloisters; it damaged ancient musical instruments, Etruscan artifacts, scientific devices used by Torricelli, models of flying machines by Leonardo; it smeared an oily film on more than 700 paintings and two million books.

The calamity struck at a particularly bad time. The Uffizi had been vandalized, vines and roots were repossessing ruins at Pompeii, the frenzied traffic of Rome was jarring frescoes from the walls. In Milan the Last Supper was fading, in Venice artistic treasures were under attack from salt air, acid pigeon dung, and termites. Earlier that year Italian officials, concerned but short of funds, had smiled engagingly at foreign journalists and said: the legacy of Rome, the culture of the Renaissance are not merely Italian; they are the heritage of western man.

Mary Witherspoon has lived and travelled extensively in Italy and is now completing a book on the 1966 flood in Florence, to be published by Macmillan. She is the author of Seekers *(1971) published by Macmillan.*

The journalists took the hint and published it, but their efforts went largely unrewarded until the coming of that fierce November flood. After that for weeks the worldwide press indulged in sentimental epitaphs for things —bits of plaster, pigment, carved wood, cast bronze—as though their loss would mean the snuffing out of an eternal flame. Public response was staggeringly generous, giving new meaning to the old word "renaissance," casting fresh light on that gloomy decade known as the Sixties. But as soon as the water went down and the salvaging started, the questioning started, too. How did it happen? Why? Especially why, when it has happened just that way so many times before?

First of all, of course, it was the weather. The ground was already saturated from days of heavy rain when on November 2 a wild southwesterly wind (known locally as the *libeccio*) blew up from Africa. In the Tyrrhenian Sea it collided with a cold north wind, and the result was a cyclonic storm that moved inland, pulling a mass of warm and humid air behind it. This warm air mass hit the Apennines and gave the valleys below prodigious cloudbursts. Florence got, in less than twenty-four hours, seven and a half inches of rain, one-fourth of its normal rainfall for a whole year. Yet even this might not have provoked catastrophe had not the whole of the Arno watershed got the same intensive rain.

The Arno begins on the southern slopes of Monte Falterona, where eight small streams merge and go tumbling down to the Casentino valley. This is the first of a chain of ancient lake-beds through which the Arno flows. Each basin is joined to the next by a deep and narrow gorge, so that the river, entering tame, is pumped to a wild velocity as it exits. In the plains between the gorges, before the Arno reaches its mouth at Pisa, it gathers innumerable tributaries, only one of them having alarming volume. This is the Sieve, which drains the whole Mugello valley to the north, and of which Italians say *L'Arno non cresce, se la Sieve non mesce* (prosaically translated "The Arno never floods unless the Sieve floods with it.") On the night of November 3, the Sieve, coming in ten miles upstream from Florence, was just as swollen as the Arno was, and the confluence of the two spelled tragedy.

In the search for causes, one journalist, blaming topography, came up with a graphic simile. Italy, he said, is like a house with a very steep roof, no gutters, and a narrow, tender lawn. When rain pours unimpeded down the roof, it makes gullies in the tender lawn below.

But why does the run-off come so unimpeded? In Etruscan times, the hills of Tuscany still were lush with trees. Then the chestnuts were cut for sailing-masts, the beeches for ships' keels, the oaks for wine presses. Even the scrubby myrtle was hacked out and bled for its tannin. The lower slopes were cleared for farming or for pastures. When nothing was left but *garriga* (scrubland), fit for grazing, the sheep went at it and vigorously grazed down to the Pleiocene clay. All this went on before the first recorded floods in the valleys.

Some reforestation has since been done on the higher slopes. Lower down, romantic herbs and eastern cypresses, olive trees and vineyards are growing, creating an illusion of fertility. But the surfaces of the higher slopes are too easily drained, and the clays are too easily baked. In summer the skimpy rains soak through or run off, the roots of plants grope down to sub-soil or go ranging spider-fashion near the surface. Above the ground, plants shrink into themselves seeking survival, leaving naked patches of soil exposed to a merciless sun. In winter the rain comes in torrents; it funnels down through fan-shaped gullies into river beds that cannot hold its volume.

After the 1966 flood an inquiry was ordered into the possible misuse of two hydro-electric dams below Arezzo. The reservoirs of both dams were full on November 3, and the engineers simply opened their sluice-gates, forwarding the problem downstream. The engineers made easy targets, but they also had ready answers. The dams were single-purpose, built for power, not for flood control. Full reservoirs in winter are as necessary to power dams as weirs were necessary for the turning of medieval paddle-wheels. Had they not opened their sluice-gates that night, they might simply have wrecked the dams.

Italians are past masters at hydraulics (having taught the rest of the world much of what it knows on that subject), and it is foolish to assume that through the centuries they have done nothing to tame the Arno. They have simply done nothing that worked. When in the sixteenth century the Florentines had subdued both Pisa and Arezzo, they owned the whole course of the Arno. But they had won themselves a permanent dilemma. The river they hoped to control was used for snaking down the trunks of trees cut in the Casentino, for powering artisans' lathes, turning the paddle-wheels of wooden mills. It was no longer navigable, even in the summer; its natural mouth had silted up, and its flow was choked with weirs; its lower valley was webbed with canals.

The engineers of the Medici Grand Dukes knew that a river never travels empty-handed. The drainage of marshes along the Arno's course had given it the dirt-load of the ditches; the road-cuts of Romans, the Pisan and Luccan canals, Etruscan fields the Romans left untended, the thousands of acres that lay idle after the great Black Death, all of these gave the Arno dirt and raised the level of its bed. The engineers were powerless to put the soil back on the mountains, so they tried to make the Arno take it to the sea. They tried to straighten the river's meanderings with levees; they tried giving it a steeper gradient; they even tried using the floods they couldn't avert to defeat the floods that might come, by directing the Arno in spate to put down the soil where it should be. Leonardo himself had promoted this, and it worked—but too slowly for Florentines, too uncertainly for an arrogant people talented in trading and dependent on the market price of goods. For the engineers the problem was never merely mechanistic, never simply whether, or even how, the Arno might be controlled, but to what end, by whom, and in whose interest.

The Grand Dukes' engineers and their successors can only be said to have failed. Control of the Arno remains a dilemma. Reforestation started much too late, and a river regulation plan begun in 1952 has never been adequately implemented. To protect the cities through which the Arno flows, somebody suggested raising the height of embankments. But Professor Livio Zoli, a realistic Italian forest hydrologist, points out that embankments in Florence would have to be thirteen feet high to keep the Arno out when it wants to come in. It might be more sensible to move the city of Florence. Professor Zoli suggests, instead, ripping out the remaining weirs, building holding basins (to be kept empty, as the reservoirs of power dams are not), or digging an enormous drainage tunnel.

The floods that have come on "the devil's days" are only three among many. One Bernardo Segni wrote of the serious flood of 1547 that it ought to serve the Florentines as a warning; the tragic devastations would surely recur in a state where governments lack intelligence, citizens lack authority, and the tampering of engineers only serves to make things worse. His warning has an eerily universal and contemporary ring.

The 1966 disaster brought us consciousness not only of a shared artistic heritage but of another heritage from which we may all profit, if we will. That is the heritage of universal human error, of anarchic aims and bureaucratic bumbling, the failure to adequately plan, in time, so small a thing as this: the legitimate uses of one hundred and forty miles of a modest river. □

Helping Global Clean-Up

Interview With Dr. James Lee, Director, Office of Environmental and Health Affairs, World Bank

By Truman Temple

Dr. Lee, can you tell us what the World Bank does?

The World Bank is the single largest economic development organization in the world. It provides financing for projects in developing countries.

We made loans for development projects last year that approximated $8 billion. Total loans outstanding that we have made since the inception of the bank in 1945 are probably somewhere in excess of $50 billion. As you can see, we are a very large economic development organization.

We have about 4,000 employees, from about 100 countries, the majority of whom are in headquarters in Washington, D.C. with several hundred located around the world.

Our mission is to assist the developing countries in providing their people an improved standard of living, improved socio-economic conditions, and developing the infrastructure of these countries. Within the last three years, we have been focusing on projects which are targeted for the very poorest of the poor. I am talking about that 40 percent of the Third World population where the per capita income approximates something around $100-$150 a year.

These types of projects largely have been aimed at those who live in the rural environment, but also increasingly for those in urban areas. As you know, the rural-urban migration phenomenon is not only here in the United States or in the developed world, but is a phenomenon all over the globe.

We find that disturbingly large numbers of people are moving off the land and coming into the urban environment seeking a better life, and better employment opportunities. So we are trying to find ways, first of all, of providing more opportunities for them on the land.

And secondly, where they have come to the large cities, we are attempting to provide them with projects which serve to meet their basic human needs.

Truman Temple is Associate Editor of EPA Journal.

How was your environmental office created and why?

It was created in 1970, two years before the United Nations Conference on the Human Environment in Stockholm. It was created ostensibly to address itself to the environmental problems that can be caused by these projects I have just mentioned.

The Bank at that time was funding projects in a number of sectors—industrial, tourism, agricultural, transportation, power and so on. Many of these projects, while they were designed to help the population and the country, were not without their own threats to the environment, as we have learned in the United States from our own experience.

So the role of the environmental office was to identify those problems and to provide countervailing measures for their control and prevention.

Do you use the equivalent of environmental impact statements in these loans to the Third World?

We use something analogous to them in that all projects are subjected to an analysis of their potential or identifiable environmental impact. Studies then must be carried out to further define the problems and the measures to control or prevent them.

Very often these consist of on-site studies either by the Bank staff or by consultants or experts from other agencies in the U.S. or in member government agencies. The Bank staff and the borrower then determine what measures will be employed and which standards and criteria applied.

So we are not confined to the rigors of the National Environmental Policy Act. But we avail ourselves of standards and criteria from many sources, including those described—by the World Health Organization, or the International Labor Organization or by the EPA or by similar agencies in other countries. And we look at that particular project in its economic, social, political, and environmental milieus and we determine then what are the appropriate standards to be applied.

When it comes to the effect of a project on the people's health and well-being, then, depending upon the nature of that threat, the standards we set may be fixed standards. In other words, standards that are internationally accepted.

Let me give you an example. If we are going to have an industrial project where we know we are going to be putting fluorides into the environment, we know full well the toxic effect of fluorides. We know what is going to happen to the human organism if the fluoride impinges upon it. And we know what standard needs to be applied to that. So that is a fixed standard, which we don't negotiate, which we insist upon as being absolutely necessary for the protection of the health and well-being of the population being affected by the project.

Suppose you loaned money for a coal-burning power plant and it is determined that they must add a scrubber for the stack emissions and maybe it doesn't work right. Can the World Bank then say, "You are not carrying out the spirit of the contract," or is enforcement up to the member government?

These scrubbers, as you know, do present problems in terms of the acceptability of the technology, but let's take that example. If we were to determine that a scrubber was necessary, we would then prescribe what the sulphur dioxide levels would be around the plant and in other areas.

We would set standards and work with the borrower in attempting to find a scrubber that would do the job. We would work with the borrower in designing the specifications and the guarantee by the supplier that it would in fact, do what it says it will do.

After installation, if we found that sulphur dioxide values were being exceeded, that could reasonably occur for a number of reasons. Either our technical judgment was faulty or the scrubber did not measure up to specifications, or maintenance was not being properly carried out.

In any event, there are a number of remedies that can be taken under the terms of the contract. Let's take the extreme. Let's say the borrower just doesn't care about the release of sulphur dioxide to the environment.

If he is willfully and knowingly negligent, then under the terms of the loan there are a number of remedies, the most severe being that we just stop disbursing against that loan until this matter is rectified.

So these loans are spread out over a time period where you still have a grip on them?

Yes, most loans, depending on their nature, run 15 to 25 years. In an industrial loan type that you have just described, from the time the loan is made to the time the plant was operational might be a period of three to five years.

There is a shake-down period, and then the plant goes into full operation. At each point in that process we would look at the plant to determine if management is doing what it agreed to do in the loan.

Namely, is the control technology being installed? Is it the correct control technology? During the shake-down period is it being operated properly and is it doing the job that we hoped it would do?

And then, during the post-start-up period, there are frequent supervisions by the Bank. It would determine whether the plant is being operated in a proper way, whether there is any negligence, any problems, and whether the sulphur dioxide levels are being kept within the range that we had set.

Some of the loans now being made are directly for environmental clean-up, such as an incineration plant in Singapore. Is this a new departure from the World Bank's original philosophy?

It is a fairly recent outgrowth of the Bank's experience with the environmental dimensions of economic development. After the UN Conference on the Environment in 1972 there was an increased awareness on the part of Third World countries as to both the threats and the opportunities that were being presented by this international look at what was happening to the environment.

And our experience in the Bank from 1970 up through about 1974 encouraged our own management to suggest that it was prudent and wise for the Bank to entertain sympathetically a project which would be called "environmental." In fiscal 1976, for example, the Bank loaned about a quarter of a billion dollars for water pollution controls.

These projects take many forms. There is the one which deals with the problems of solid waste and also traffic constraints in Singapore. There are those such as the Yugoslavian urban environmental control in Sarajevo, a very comprehensive project designed to clean up a city of 400,000 people that was being subjected to some very severe pollution problems. And there are other projects like the protection and reclamation of land which has been subjected to desertification. There are reforestation-type projects, soil conservation-type projects, flood control projects.

These are some of the examples. The Bank welcomes and is trying to persuade developing countries to come forward with so-called environmental projects where they can be shown to fit into their economic development plans.

You mentioned traffic restraints in Singapore. Can you explain that project?

This was an attempt on the part of the city officials of Singapore —and I must say, along with the expert help of EPA—to determine how best to control traffic in their core city. If you have been to Singapore, you know that the physical, spatial arrangement of the city and the very heavy traffic use is causing some very severe pollution problems directly attributable to the automobile.

The question was how might the city go about restricting use of the core city in such a way as to not cause any serious economic dislocations. The Bank staff along with the Singapore authorities and with EPA worked on this project in a joint way.

Dr. James Lee

Was there a loan involved in this?

No, this was a research study only.

Why would they need money to restrain traffic?

The money provided by the Bank was for the researching of this traffic problem.

We also made a loan, to the Singapore Environmental Control Project, and this loan also included provision for the handling of solid waste, which in Singapore, being sort of an insular-type of environment, presented some difficult problems.

We notice the Bank loaned about $20 million to Finland a few years ago for water pollution control. We don't think of Finland as an emerging nation. How was that justified?

Finland has been one of those few countries that had reached a very high level of economic-social development, and since 1970 certainly had not been a significant borrower from the Bank. And, in fact, it was determined that this national water pollution control loan would be the last one to Finland. It recognized that Finland in its development activities, which had gone certainly quite rapidly since the end of World War II, was not without its own threat to its environment, namely, that its industrial pollution and particularly its pulp and paper sector were contributing heavy amounts of pollutants to surface waters. The people of Finland via referendum told their government that this problem had to be cleaned up.

They were determined that their surface waters would be restored to something approaching their previous condition and so contributing funds were voted by the people of Finland. Countries at various levels of economic development are required to put some part of a total cost of a loan under their own resources.

This is standard practice?

Yes. The country determined by national referendum that it would voluntarily provide those funds from its own resources.

There is some concern that countries like Haiti and Madagascar have altered their climate by cutting down forests for firewood and other uses, and that this is not a good long-term use of the land. Is there anything the World Bank can do to reverse this trend?

Well, the whole matter of tropical forest ecology and its role in the maintenance or the determination of weather patterns and such things as oxygen/carbon dioxide balance has been of concern to us. Lately we have come out with what we call a forestry policy paper, which we feel is probably one of the finest policy descriptions that we have seen anywhere. It focuses quite heavily on tropical forests and how they need to be managed, and their role in the ecology of a country or region.

Speaking particularly to the role of tropical forests in the determination of weather patterns and perhaps longer term climatic changes I have yet to be satisfied that the removal of forest vegetation that has gone on and what is now projected is, in effect, going to have a demonstrable effect on the climate or the long range climatic conditions.

You mentioned a loan to clean up the air pollution of Sarajevo, Yugoslavia. That seems like an unlikely place for air quality control programs.

Had the geography or the topography there created a pocket of some sort?

Sarajevo, Yugoslavia, is best known as the site where in 1914 the Archduke Ferdinand of Austria was assassinated. So it is often thought of as being the site of the beginning of World War I. It is a very old city, which is sort of a meeting ground for the cultures of the West and the East, and it has a very interesting historical and cultural background.

After World War II, the city and its environs began to develop, and the population increased from 75,000 to roughly 400,000 today, so you can see how rapidly it has grown. This growth has not been without its threats to the environment and to the people.

It is a city which sits deep in a valley and it is surrounded by very high mountains. It is subjected to long periods of temperature inversions. As you know, inversions are like a cap, which sits over an area with the warm air trapping cold air below it, and this affects the exchange of pollutants to the atmosphere. In other words, it acts as sort of a lid on it.

Furthermore, in that particular area of Yugoslavia, they don't burn coal. They burn lignite, which is a low-grade form of coal, and this particular lignite has somewhere around three percent sulphur content. So that meant that all the houses and all of the offices and the factories were utilizing lignite as the principal fuel, which meant that when the temperatures went down and heating requirements went up, the release of pollutants, particularly sulphur dioxide to the atmosphere, jumped markedly. When they had these long periods of inversions, the pollutant levels reached a point where they were being reflected very demonstrably in poor health.

Secondly, the city's water system, which had been partially installed back in the 19th century, was very inadequate to supply the growing needs of the population, to the effect that in 1972 and '73 they only had water for something like six or seven hours a day.

And then when no water was available, the sewage which was being collected by an ancient and neglected sewage collection system installed under the old Austro-Hungarian empire, would spill out where the pipes were broken and would be back-siphoned into the water supply system so that when the people finally got water again the next day, they were also getting the pollutants from other houses and hospitals.

Sarajevo really felt its water and air pollution health statistics were alarming. It needed to take some drastic measures to bring the problems under control. So we were pleased to help in what was our first comprehensive urban environmental control project.

On the subject of desertification, has the World Bank made any loans to control this problem?

Yes, it has. The loans are being made largely in those countries of West Africa which lie within the Sahel region, where desertification reportedly has been going on at a very rapid and alarming rate.

We have made a number of loans to countries there that are designed to meet the problem of desertification especially as it pertains to the impact of cattle and their nomadic movements. There are some very large herds of cattle moving back and forth across the land. We want to bring them under some form of reasonable control, both in terms of the carrying capacity of the land and in trying to halt this spread of the desert as a result of these activities.

We are now giving more financing to projects there which not only will stem the movement of desert, but also reclaim lands that have gone into the desert-like environment. These projects include improved methods for getting water on the land, setting up shelter belts for restoring forest cover, and so on.

The Bank announced a little while ago it was going to support the World Health Organization in an attack on tropical diseases. Can you describe how your office might be involved in this?

These are the long neglected diseases of tropical countries—and there are six or seven of them. The distribution and the prevalence of these diseases has reached a point where they present real threats now and in the future to the development of countries where they are endemic.

We find very frequently in those tropical countries where we are working, the individual is multiply parasitized or has multiple diseases resulting from one or more of these tropical ailments.

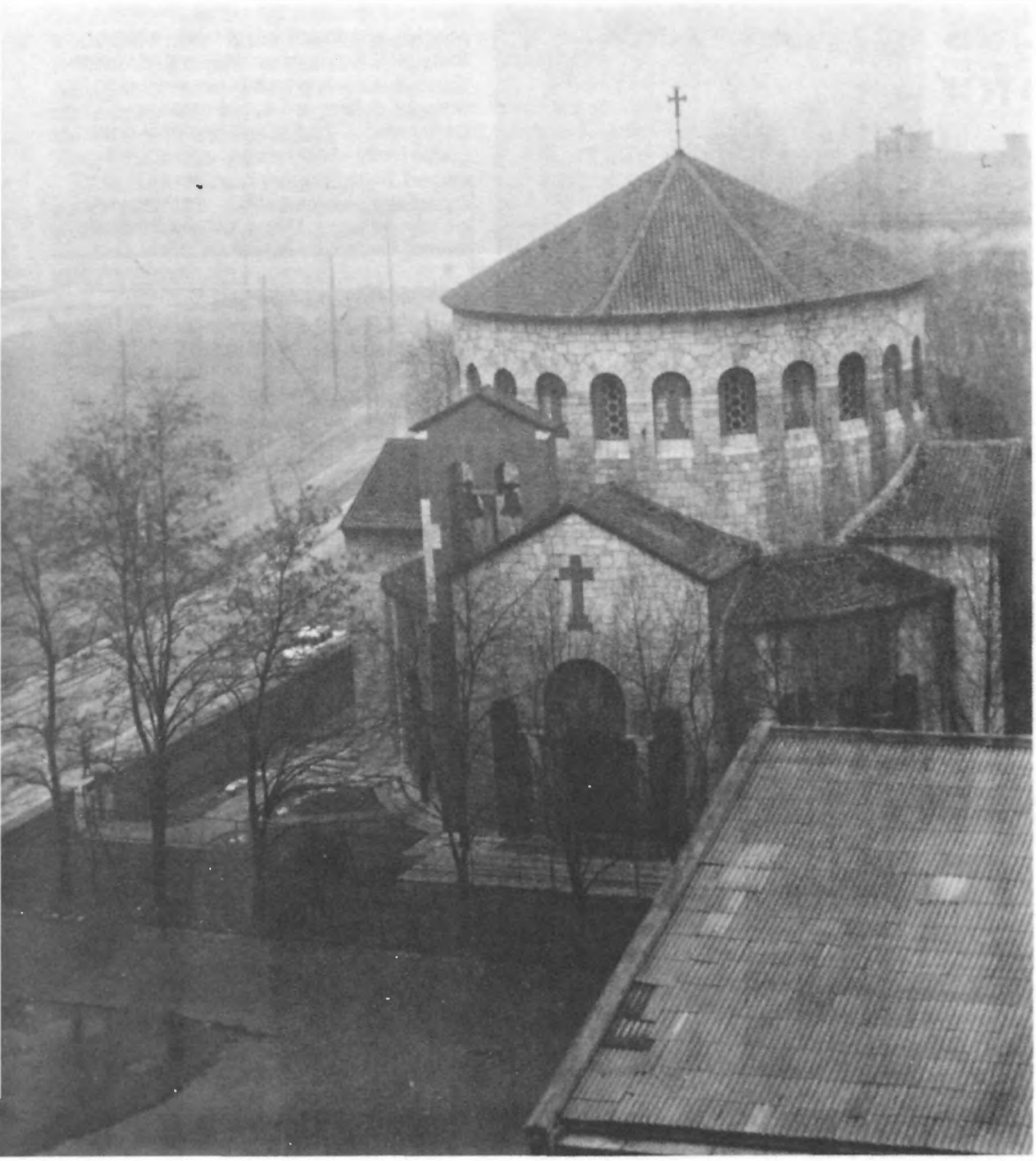
We also realize in our efforts to control these diseases within the framework of Bank projects that our little black bag, our doctor's kit, if you will, is very deficient insofar as we do not have vaccines for their prevention, and the chemotherapy or the drugs that we are using for the control aren't very good and not without toxic side effects.

Simply put, for six or seven of the major tropical diseases in developing countries, we just do not have good workable ways of bringing them under control. So when the World Health Organization along with the United Nations Development Program invited the Bank to participate in the sponsoring of this worldwide program of research into better ways of preventing or controlling these diseases, we saw it from a different point of view.

We saw the diseases from the standpoint of their role as an obstacle, as a deterrent to economic development. Sick and debilitated people just can't make good use of the tools that you give them regardless of what you do.

And we also recognize that there is a very urgent need for research to get under way, so late last year we joined the World Health Organization and the UNDP as the co-sponsor of this very large global program for research and training in tropical diseases.

The Office of Environmental and Health Affairs is the Bank's focal point for the conduct of this program.



Burning lignite for fuel in Sarajevo, Yugoslavia results in air pollution so dense that it nearly obscures the buildings behind this church.

What are the tropical diseases you mentioned?

What we call the "big six" are malaria, schistosomiasis or "snail fever" disease; trypanosomiasis, often called "sleeping sickness"; filariasis; leprosy; and leishmaniasis, named after a British medical officer, Sir W.B. Leishman, who identified it.

There also is another set of diseases that take a huge economic toll, not only of a country's own citizens but of tourists. The diseases are simply the diarrheal diseases, and they are the one feature of travel that most people know all too well. Over half the tourists visiting many Latin American countries come down with the malady, where they call it "turista."

Although usually just an inconvenience to the traveler, diarrheal diseases are a very serious health problem for citizens of most developing countries, and cause more than 147,000 deaths a year in Latin America. In fact, they are the leading cause of death in five Latin American countries.

Is environment a factor in this problem?

Yes. We don't know all the causes of diarrheal diseases, but contaminated raw vegetables and fruit and drinking water play a part. And until these countries can solve the problem, it will continue to have a negative impact on tourism, including the earnings in foreign currency that could be gained if residents of developed, affluent countries had less fear of illness in visiting such countries.

Many developing countries offer great potential appeal, including ideal weather, beautiful beaches and mountains, and exotic wildlife. Yet relatively few tourists now visit them. Tourists spend about $45 billion annually visiting other lands, but only 20 percent of this reportedly goes to developing countries. And a recent study found the major deterrent to tourists who might visit them was the fear of sickness. Other studies confirm that by far their most recurring and worrisome complaint is this particular ailment. Indeed, the problem is so serious globally that more than a score of the world's foremost researchers in diarrheal diseases met recently at the Pan American Health Organization headquarters in Washington to discuss strategies for dealing with this environmental, social, and economic challenge.

Doctors do have some prescription medicines that can treat people suffering from diarrheal diseases. But this is no substitute for prevention. Compared to the enormous impact these diseases have on people's health and national economics, the resources needed for prevention are small. And the time has come for governments, the international biomedical community, foundations, and research organizations to find a solution to this problem.□

Carter Pledges Air Clean-Up for Denver

President Jimmy Carter last month pledged his personal support and interest in Denver's efforts to clean up its air pollution.

Speaking there on May 4—the day after Sun Day—the President expressed his belief that Denver's former air quality can be restored.

"And I am determined as President to help," he declared. "I have asked our Directors of the EPA here, and the Federal Regional Council to keep me informed from month to month, what progress has been and is being made and if I can help personally as President, I will be glad to do it, but the major responsibility falls upon the shoulders of the individual citizens of Denver and the surrounding area."

The President, who was accompanied by EPA Administrator Douglas M. Costle, used the occasion to announce a new environmental program: The Denver Air Project. Designed to improve the coordination of some 25 Federal activities involved in air control in the metropolitan area, it is the first of its kind in the Nation to attempt this task.

Up to $42 million will be made available for the Denver Air Project if it develops successfully as planned. Some $15 million will be allocated by the project for such activities as transit-related construction, free off-peak bus service, electric car use, and measures to prevent tampering with auto emission controls. In addition, a $16 million Urban Mass Transit grant from the U.S. Department of Transportation will be used to improve bus service in Denver.

"I believe that we can deal with this problem not through heavy-handed government prohibitions, but rather through a positive demonstration of how Federal, State, and local resources—and of course those of the private sector as well—can be brought to bear in a coordinated way," Carter said. "The Federal Regional Council under Betty Miller has done an unprecedented job in bringing together all these forces in a common effort, working very closely with Alan Merson of the Environmental Protection Agency."

Tracing the history of the city's gradually enveloping smog, the President noted:

"Not long ago in Denver you could almost always see the mountains in the distance. And you could almost always draw a breath of air with both pleasure and safety.

"But today a brown cloud of dangerous pollution frequently hides the mountains and invades the lungs of the people of this city."

The President pointed out that Denver's growth rate is two and a half times that of

the average American city, and by the year 2000 it will have added the equivalent of another Washington, D.C. in population. Auto use has been growing even faster, so that Denver now has more cars per capita than any other metropolitan area in the Nation, he declared.

"The result has been financial prosperity—and also problems. Denver has the worst carbon monoxide problem in the whole Nation—three times worse than national health and safety standards permit. And other pollutants, hydrocarbons, sulfur oxides, particulates, endanger the air of your beautiful community," he said.

The President emphasized repeatedly the need for local citizen participation to make the air clean-up effort effective. Noting that pledge cards were being distributed asking individuals to promise to ride the bus, ride a bike, walk to work, car pool, or take other measures to abate air pollution, he emphasized that much depended on the role of the individual and on local organizations.

"Denver's pollution problem is decentralized, not caused by a few large pollution-spouting factories or industrial plants, but caused by hundreds of thousands of individual vehicles," he said. "That means that everyone must help deal with the problems, and I am confident that the people of Denver will respond with support for the efforts that will be launched or enhanced through the Denver Air Project."

Despite the seriousness of the occasion and the air pollution problem, Carter showed a flash of humor in beginning his remarks.

"Yesterday when I arrived for Sun Day it was raining," he observed, "and this morning when I'm going to talk about the smog in Denver, you have beautiful skies. I think this illustrates what careful planning can do."□

Denver swathed in air pollution

Control Benefits Exceed Costs

By Administrator
Douglas M. Costle

The role of government in the economic life of the country is greater than ever, and basic questions are being raised about the nature of that role.

I'd like to talk to you about EPA's Regulatory Reform Program. It underlies EPA's long-range program for dealing responsibly with an issue that's at the top of everyone's list—inflation.

None of us can be unconcerned that prices are rising again, that Americans are again jittery about having to pay more and more for the essentials—food, shelter, and clothing.

My particular concern, of course, is whether and to what extent environmental protection contributes to the inflation rate.

Many economists define inflation as an increase in prices of goods and services, including capital, without a corresponding increase in value.

Depending on their varying schools of thought, economists offer varying explanations for inflation. Some say its root is government's monetary and fiscal policies. Others say that it is caused by excessive wage settlements. Still others cite the effects of costs imposed by environmental or other regulation. It is this last reason I would like to discuss.

As measured by standard measures, such as the Consumer Price Index (CPI) EPA's programs do contribute—modestly—to inflation. Chase Econometrics, which studied the issue for EPA, concluded that the Agency's programs add an average of between .3 and .4 percent annually to the Consumer Price Index.

Those figures do not reflect recent legislative changes and may therefore need revision. But the point is that, even by standard economic measures, any conceivable modification of current regulations would not make a dent in the CPI.

Furthermore, an estimated increase in the CPI does not mean that environmental regulations are inflationary. The CPI ignores improvements to public health, reductions in property damage, increases in crop yields, etc., that result from pollution control spending. If the CPI were adjusted for these improved outputs, then pollution control spending would not appear inflationary as long as the benefits exceed the costs, which I believe is generally the case.

I agree with economists like Paul Samuelson, who, based on similar reasoning, have suggested that conventional economic measures such as the Gross National Product should be changed. I hope they will be.

In the meantime, we must continue to evaluate the benefits of environmental programs, both to health and to other forms of well-being. It is common knowledge that pollutants can be dangerous to your health. They also cause substantial property and economic damage, disrupt fisheries, and reduce crop yields. When I was out on the West Coast last fall, for example, I was told that grape yields in the vineyards around parts of Southern California have fallen sharply, in some cases by as much as 60 percent. Researchers looking at the problem have concluded that photochemical oxidant—smog—is the problem.

We don't yet know the full economic costs of the impact of pollution on health, property, and animal and plant life. We are learning, however, that they are much more substantial than we once imagined.

The calculation of benefits of environmental programs is still a developing area of economic analysis. There are no exact estimates, in dollar terms, of the environmental damages we are attempting to reduce. The studies that have been done in recent years, however, do generally conclude that the costs of our regulations are warranted by the benefits derived.

And it is important to remember that we are judging the worth of our regulations based on the damages they reduce. There is presently no way we can calculate the cost of future harm we can anticipate from pollution that is already in the environment. But we know it's potentially enormous. PCB's come to mind.

All manufacturing of PCB's has stopped. Nevertheless, we estimate that there are about 750 million pounds still in use, 300 million pounds in landfills and dumps (most of it uncontrolled), and 150 million pounds simply loose in the environment. There is no doubt at all that more PCB's will be turning up in the environment, and they have a half-life of more than 100 years.

We don't know yet what the effects will be in people exposed over most of their lives to PCB's and other toxic chemicals, but we do know, or are learning, the short-term effects of some of these chemicals. We know that the pesticide DBCP causes sterility, and we know that Kepone causes nerve damage. It is less clear exactly what the chronic effects of these and other chemicals are, particularly at very low levels for long periods of time.

We must acknowledge the fact that we've launched a chemical revolution in this country in the last twenty-five years—and in truth we don't know yet what the consequences of that revolution are going to be.

Reducing health and other costs related to pollution is the major benefit we realize from pollution-control programs. Other kinds of benefits—harder to "cost out"—are equally important.

How much is it worth to fieldworkers to know that the pesticides they deal with are not going to be deleterious to their health over a long period of time? To the city worker to see a clear sky? What would a child pay to be able to swim in streams that once had been too polluted to permit it? What is the value of knowing that our water is safe to drink?

We cannot put a dollar-and-cents figure on these benefits. Moreover, economists don't know how to "model" the quality of life. Yet most Americans believe that such benefits are real and are demanding a clean and healthy environment.

We would like to measure those benefits which have measurable economic value more accurately than we're now able to. We're working on that.

In the meantime, the Agency must and will rely on judgment. In making those judgments, we will make a fair assessment of both their costs and their benefits to the maximum extent that is feasible.

I do not make those complex and difficult judgments with a feeling of discomfort or isolation.

There are those who say that regulatory agencies are not subject to constraints: that there is no institutional validation for our actions. I don't believe that. Rather I believe that EPA and others operate under a very real check—the Congress. And the Congress has just completed a thorough review of two of our major programs. Both the Air and Water Acts were revised in the last year. While Congress made many needed refinements, it strongly reaffirmed the basic goals and objectives of both those laws.

In sum, I believe EPA's impact on inflation is minimal but growing. I also believe that the benefits of pollution control, whether computed or not, exceed the costs. Most important, I believe that the public wants those benefits and is willing to pay for them.

Neither the Agency nor the Congress is complacent or resistant to change. We all know there are no quick fixes or magic solutions, just as we know that a sustained effort is required to dampen the dangers of inflation. The Agency's developing Regulatory Reform Program is designed to minimize our impact on inflation. Whenever possible, EPA will regulate only when we are confident that the benefits exceed the costs. And we are committed to find more efficient ways of meeting environmental goals in the least costly manner.

First, we are improving our system for ranking environmental problems in order of priority. Any ranking must, of course, include the social and economic implications of trying to achieve the environmental goal.

Second, we are moving to improve the efficiency and certainty of our procedures, both internally and in our dealings with the public. Everyone recognizes that red tape is a problem that constantly threatens to get out of control. More subtly, we are learning that uncertainty about requirements can be just as insidious a problem for the regulator as the regulated.

Third, we are attempting to find ways to encourage the maximum possible amount of innovation by industry in solving pollution problems. This, in fact, is probably the real key to stretching the Nation's pollution control resources as far as possible.

Our reform program includes a variety of specific projects. Some of the changes have been put in place, some have been designed and are close to completion, and some are still in the experimental stage. I believe that those we regulate will soon begin to see some of the results.

When I arrived at EPA, the first thing I looked at was whether we had a sensible, workable system for intelligent decision-making. As it happens, the Agency had, in fact, begun to develop a system. It was designed to assure that all informed views were expressed and debated *before* an issue came to the Administrator for decision.

This means that a new regulation is not written and then shipped to me. Rather, it is subjected to an intensive review by others with particular expertise, including economists. This results in a definition of a number of alternatives. Each is then analyzed, and for each the costs and benefits are presented to me.

EPA's system proved so attractive to official Washington that it became the model for a key element in the Executive Order on Regulatory Reform recently issued by the President. That order calls for a careful analysis of regulations that may have significant economic, social, geographic, or governmental impact. As I said, EPA is conducting such analyses, and we're improving our methods as we go.

Analyzing individual regulations, of course, is not enough. We also need to improve our system for deciding what rules need to be written in the first place, when, and by what agency. These questions are decided for us by the Congress—and sometimes by the courts. Environmental problems are usually complex, and that fact is reflected in the number and diversity of programs aimed at solving them.

Dealing with toxic chemicals, for example, cuts across all EPA's major program areas, and some programs of other government agencies as well. To improve the regulatory process in this area, we have undertaken a joint effort with the Food and Drug Administration, the Occupational Safety and Health Administration, and the Consumer Product Safety Commission to coordinate our control of toxic chemicals. Working with these agencies is helping us to cope with the more general problems of duplication and inconsistent agency actions.

Specifically, we have agreed on seven cooperative initiatives. Just a few examples: one is development of compatible testing standards and guidelines; a second is development of a common, consistent approach to the problem of assessing health risks posed by hazardous chemicals; a third, coordinated regulatory action.

Other initiatives are also on our agenda, some mandated by Congress with the Agency's enthusiastic support, others developed internally. Taken as a whole, they promise to give the private sector considerably more flexibility in controlling pollution than it has had in the past. I'd like to briefly mention a few.

One important step forward is the technology waiver endorsed by Congress in the amendments to the Clean Air Act. This waiver allows companies that can show progress toward developing innovative technologies an extension of up to five years on meeting pollution-control requirements. The basic criterion, of course, is that the new approach must be able to get the job done *more cheaply, or more effectively, than* what's already on the shelf.

Strauss Supports Environmental Goals

Robert S. Strauss, President Carter's counselor on inflation, stated on a recent national television program that he believes in the environmental goals and has no quarrel with EPA.

Asked on the NBC Today Show about reports that he said that some of the rules to protect the environment ought to be relaxed because they add to prices, Strauss said:

"There is no difference between Doug Costle and Bob Strauss. We have talked many times. I didn't say these rules ought to be relaxed. I believe in the environmental goals. I said let's look not just at the environmental goals, that was an example, but look at all these regulatory goals and see if we can administer the process better, not cut back on goals, but reach them in a more sensible way.

"I don't mean any particular agency, but every one of us can squeeze back. Business can squeeze back. The professions, doctors, dentists, lawyers, all have to take a look at what we're contributing to this inflation problem."

We are also developing alternatives to the traditional "command and control" forms of regulation. For example, we're looking at the marketable rights approach, which would involve auctioning off the right to discharge a certain pollutant whose use has to be restricted. In cases where this approach proves viable, marketplace bidding would be used to allocate rights to discharge limited amounts of the pollutant. The high bidders who would win the discharge rights would be those sources which produce the most valuable products, for which no inexpensive substitutes have been found. This approach might lead to a more efficient allocation of costs to society than would the usual regulatory approach of banning certain products or processes, because EPA cannot know as much about substitutes, production costs, and likely price changes as those bidding in the marketplace.

We are exploring this kind of approach, for instance, in regulating essential uses of certain kinds of fluorocarbons. To cite another example, we've already used a "marketable rights strategy" in our emissions offset policy. This policy aids areas that face problems in staying within the air pollution limits but want to encourage new industry. These areas must now look for ways to cut existing levels of pollution in order to allow new sources to enter. This may involve working with existing industries to achieve reductions in their emissions or cutting auto emissions by increasing the availability of mass transit.

Another example of an initiative keyed to incentives instead of command builds on the differences in marginal control costs for different processes in a single plant. We are looking for ways to shape our regulatory approaches so as to allow firms to find the lowest cost means of reducing their pollution by the required amount.

I've only highlighted part of our program—there are many other ideas in the pipeline. Regulatory reform is not a one-shot proposition. To mean anything, it must be carefully and persistently pursued.

In conclusion, I could not say that in one brief year we have permanently restored the good name of regulation, nor eliminated every questionable "cost" of regulation. I do believe that we have built a solid initial effort and we're pointing in the right direction. We have grounded that program on sound, acceptable incentive principles, and on opening up the governmental process to new ideas.

My fear is not that we cannot solve the complex social problems facing us all, but that they may appear so complex and time-consuming that we'll all throw up our hands in despair.

Neither you nor I can afford to do that. □

(Based on excerpts from remarks by Administrator Costle to the Conference Board, Washington, D.C., April 27, 1978.)

Cities: An Environmental Wilderness

By Barbara Blum, Deputy Administrator

Ours is an urban civilization. Over three-quarters of all Americans live in metropolitan areas. Yet I doubt if one of us can say that we live in a city whose total environment has been sound in the past, is healthy now, and is likely to remain so in the future.

Daily our lungs breathe in messages of warning. Our eyes smart. Our ears ring and our heads ache as the decibel count mounts. We know that the environment in which the inner-city poor must live is frightening, unhealthy, and destructive.

In the last thirty years the exodus to suburbia raised the Nation's suburban population 200 percent while the inner-city population declined. With that migration to suburbia went the fiscal resources for city services. With it also went much of the environmental conscience as well as the economic and political power of the environmental movement.

Suburbanites have roughly triple the income of inner-city residents and consume four times as much energy. But suburbanites are exposed to less than half of the environmental health hazards inner-city residents face.

Most of the power plants and the heavily polluting industries are next-door neighbors of the urban poor who enjoy the fewest products of American technology, but are forced to consume its often lethal pollution. The poor desperately need jobs, but as my friend Vernon Jordan of the Urban League has said, "We need jobs, but we also need to be healthy enough to hold those jobs."

The inner-city poor—white, yellow, brown, and black—suffer to an alarming degree from what are euphemistically known as "diseases of adaptation." These are not healthy adaptations, but diseases and chronic conditions resulting from living with bad air, polluted water, excessive noise, and continual stress. Hypertension, heart disease, chronic bronchitis, emphysema, sight and hearing impairment, cancer, and congenital anomalies are all roughly fifty percent higher than the level for suburbanites. Behavioral, neurological, and mental disorders are about double.

Two-thirds of the 60,000 rat bites in the United States are suffered by that one-tenth of the Nation housed in the ghettoes of the inner-city.

In the city, the rate for most kinds of cancer is rising twice as fast as it is in the suburbs. For the urban poor it is rising faster yet, and for non-whites it is rising twice as fast as for whites.

But as sprawl continues, environmental injury and insult come with it. The air, water, and noise may be most lethal downtown, but increasingly the metropolitan environment is one continuous airshed, watershed and noise basin.

It's time to recognize that there is no place to hide. It's time for *all* urban residents, inner-city and suburban, to acknowledge that they share a common destiny. And it's time for the environmental movement to forge a new urban vision and make a sustained commitment to create a healthy urban environment.

On March 27, President Carter submitted proposals for a comprehensive national urban policy. "This policy," he said, "will build a new partnership involving all levels of government, the private sector, and neighborhood, and voluntary organizations in a major effort to make America's cities better places in which to live and to work."

President Carter did not want to repeat the mistakes of the past. Instead the entire Federal Government took a year-long inventory of the Federal policies that influence American cities and found a substantial number of programs that needed to be redirected.

EPA's wastewater treatment facilities grant program has unquestionably contributed to the underwriting of suburban sprawl in some metropolitan areas. That's one past mistake that EPA will be turning around in the years ahead.

All major urban areas in the continental United States are in violation of one or more of the national ambient air quality standards. All States with these non-attainment areas must submit acceptable cleanup plans to EPA by January 1979.

This past February, EPA made a joint grant to the Sierra Club, Friends of the Earth, the National Clean Air Coalition, and the American Lung Association to aid cities in meeting the requirements of the new Clean Air Act Amendments. During 1978, 50 one-day workshops will be conducted in urban areas in all parts of the country.

With the help of environmentalists across the nation, we are convinced that all 50 States can successfully develop acceptable cleanup plans.

If the President's urban proposal meets with Congressional approval, EPA, in cooperation with other Federal agencies, will provide air quality technical assistance and $25 million for planning grants during the next fiscal year to help cities work out solutions to the double-edged problem of achieving both clean air and economic growth.

On April 25, EPA proposed a number of regulations to reduce sprawl by preventing the creation of excess wastewater treatment capacity.

If areawide water quality planning and the wastewater treatment construction grant program are effectively to discourage wasteful sprawl, it's going to be because urban environmentalism becomes an effective political force within each State.

Technology also is now available for recovery of energy and materials from waste. President Carter has requested $15 million from the Congress to help communities make the transition from land disposal to resource recovery.

Already in place are new employment training programs for youth and public service under the Comprehensive Employment and Training Act. There are job opportunities in waste treatment, resource recovery and pest and insect control, as well as in air and water pollution monitoring at the State level.

Environmentalists should set a target of 100,000 environmentally related jobs from this program as their goal for the next year.

The Agency will set target goals for the $4.5 billion a year wastewater treatment facilities construction program to make sure that minority-owned businesses in urban areas receive an equitable share of contracts. We mean business; we will use our funding power to ensure that these goals are achieved.

One of the amendments to the Clean Water Act provides that EPA assess the recreational park and open space potential created as a result of the construction of wastewater treatment facilities. Communities can use a portion of the available facility planning money for recreational park and open space planning purposes. Small parks can accomplish miracles in muting sound, lowering air pollution, and providing new recreational opportunities.

Air, water, solid waste, public service environmental employment, recreation, and comprehensive regional planning—these are some of the areas in which environmentalists can use their expertise to make a unique contribution to the rejuvenation of our Nation's cities. □

This article is an excerpt from an address May 6 to the Sierra Club, Berkeley, Calif. The full text of this speech is available from Media Services, Office of Public Awareness (A-107), EPA, Washington, D.C. 20460.

Capitol Trees

In summer the great white dome of the Nation's Capitol rises from a surrounding green sea of trees.

This small forest on what used to be known as Jenkins Hill offers shade and pleasant vistas for the millions of sightseers who visit their Congress.

An educational display in the Capitol rotunda notes that these trees comprise one of the finest arboretums in the United States. In addition to providing a beautiful and ever-changing natural setting for the Capitol, the trees commemorate various historical events and personalities.

More than 100 species decorate the Capitol grounds. What was once the most famous tree on Capitol Hill, a huge English elm that reportedly shaded George Washington while he watched construction begin on the Capitol in 1793, had to be removed in 1948 before it collapsed.

Three mammoth elms believed to be older than the Capitol itself still stand. One located next to the sidewalk on the House side is known as the Cameron elm after Senator Simon Cameron of Pennsylvania.

The senator is said to have seen workmen preparing to uproot all or part of the tree to permit construction of the sidewalk. He ordered the workmen to stop and stormed into the Senate where he delivered such a powerful address on the value of trees that the elm was spared. Today this monarch shades a large area with its huge green leaf crown, but it is leaning so badly that it has to be supported by a heavy guy wire.

In contrast to this imposing elm is the relatively young and slender Franklinia growing near the Senate side of the Capitol. It is a cultivated specimen since the Franklinia is no longer found in the wild.

This tree, which produces large creamy white flowers with the fragrance of orange blossoms, was discovered in 1765 in southeast Georgia by John Bartram, the King's botanist. It was named after Benjamin Franklin and Bartram dug up some specimens and sent them to Philadelphia and other cities. The small number of Franklinia growing naturally subsequently died out.

The tallest trees on the grounds are the tulip poplars. They have trunks like Greek columns and bear tulip-shaped green and orange flowers that bloom high in their lofty branches.

Another conspicuous tree is the gingko with its fan-shaped leaves. The fossil prints found of such leaves indicate little change over a period of millions of years.

The gingko was imported from China. It is one of the many trees on the grounds which were brought to this country years ago from foreign lands. Europe has contributed many species including purple beeches and various elms. The deodar cedar is an import from the Himalayas.

Much of the shrubbery around the base of the Capitol is Japanese privet and splatter-leaf acuba from Asia. Many of the flaming azaleas were also contributed by foreign countries.

The grounds boast a magnificent collection of oak trees, 11 different species of magnolia, nine species of maple, and nine of elm.

In addition to providing beauty, the trees serve as silent instructors and models because they are marked with plaques giving their common and Latin names. No tuition is charged in this extraordinary outdoor classroom.

All during the spring, summer, and fall the trees decorate the grounds with their foliage and various shades of white, pink, purple, and red blossoms and fruits. In winter the deep green of magnificent hemlocks and pines standing in the snow keeps bright the promise of renewed life with another spring.

Among other varieties of trees shown are redwoods, silver beech, tupelo, pecan, horse chestnut, ash, holly, butternut, silverbell, walnut, osage orange, sweetgum, hickory, persimmon, dogwood, redbud, raintree, larch, spruce, sycamore, sequoia, linden, jujube, buckeye, fir, sassafras, cottonwood, paw paw, and various flowering fruit trees.

In all seasons and in all weather the Capitol woods are a symbol of the Nation's interest in the environment and the world of nature.—C.D.P.

Around the Nation

REGION 1

Town Meeting Held
Region 1 and Save the Bay, Inc., cosponsored an environmental Town Meeting in Rhode Island last month. Regional Administrator William R. Adams, Jr., and R.I. Department of Environmental Management Director W. Edward Wood answered citizens' questions. People who attended the meeting were interested in the impact of new environmental laws dealing with toxic substances, solid waste, clean air, and clean water on private industry, and the effects of oil spills on the shores of the Ocean State. The meeting was the first in a series that will continue throughout New England this year.

Vermont Bans Phosphates
Phosphate-laden detergents can no longer be sold for general use in Vermont under a law passed by the 1977 State legislature. The law forbids sale of detergents with large amounts of phosphate, except those used in dishwashers or for the sanitation of medical, food processing, or dairy equipment.

REGION 2

Permit Change Denied
Region 2 Administrator Eckardt C. Beck has denied a request for hearings by ten oil companies that have protested conditions, which they consider too stringent, in the EPA permits allowing exploratory off-shore drilling in the Atlantic. Beck told the companies that EPA sees no technical basis for changing the permit conditions, and said he will refer all issues of law to EPA's legal office in Washington, D.C., for resolution. The permits, which are issued under the requirements of the 1972 Federal Water Pollution Control Act Amendments, stipulate the limit of oil and greases from deck drainage, drilling muds and cuttings, sanitary wastes, as well as other effluents generated in normal operations during the exploratory phase of drilling only. If oil and gas are discovered, a new public hearing and new permits will be required for actual production in the Baltimore Canyon area of the Mid-Atlantic Outer Continental Shelf. The oil companies have contended that EPA discharge limits and monitoring requirements are not necessary or reasonable. "EPA finds the permit provisions quite sound. But as added assurance, after 45 days of monitoring effluent data we will review our decision on the limits for oil and grease in deck drainage discharges," Beck said.

REGION 3

New Office Established
Administrator Jack J. Schramm has ordered Region 3 to reorganize staff positions related to the States and the public into a new entity, The Office of Intergovernmental Relations and Public Awareness. The new Office brings together the former Office of Congressional and Public Affairs, the Environmental Impact Branch, the Control Agency Grants Branch, and several individuals. Schramm said that he personally designed the new organization in order to "improve EPA's image among our key constituents: the public we serve and the States with whom we share our environmental responsibilities." An innovation of the reorganization is the creation of State Program Officers, who will be responsible for working with officials of State and local governments and other environmental agencies, to increase cooperation and to improve transfer of up-to-date information among all parties. The new office also will be active in public participation, media relations, and environmental impact statement preparation and review.

EPA Helps Out
Region 3's Surveillance and Analysis Division aided residents of Marcus Hook, Pa., when three homes were destroyed by gas explosions and three others were damaged. The explosions were caused by butane gas leaking from an underground storage cavern owned by the Sun Oil Co. An investigation showed that gas had escaped from the storage cavern because it was overfilled, but no EPA regulations were violated. At the request of local officials and Congressmen, Region 3 monitored the area and recommended that cracks in the basement floors of 39 affected homes be sealed and that individual gas monitors be installed in each home. The work was done at the expense of Sun Oil and inspected by Region 3 staff after completion.

REGION 4

Air Pollution Agreement
As part of a settlement reached with EPA, the State of Alabama, and Jefferson County, U.S. Steel is installing air pollution control equipment costing about $35 million at its Birmingham plant. The company agreed to pay $2.975 million in civil penalties as well under the agreement, but instead of paying the fines directly will install controls costing that amount to various facilities at the Fairfield works. These controls are in addition to those required by State and Federal law. Other controls and closedowns are outlined in the agreement, and U.S. Steel has agreed to pay up to $5,000 daily for violations of emission standards or final compliance schedules stipulated in the agreement.

Power Plant Hearing Held
EPA held a public hearing in Bedford, Ky., on the draft Environmental Impact Statement and possible water pollution discharge permit for the Louisville Gas & Electric Company's proposed 2,340 megawatt coal-fired power plant. The key issues discussed were: concern about existing air pollution from the Clifty Creek power station in Madison, Ind. and the possible aggravation of that problem by the new plant, disagreement over the effectiveness of scrubbers, and concern about the number of power plants being built along the Ohio River.

REGION 5

PCB Cleanup Sought
Region 5 and U.S. Attorney Thomas P. Sullivan have filed a suit in Federal District Court in Chicago asking the cleanup of PCB's from sediments in the harbor of Waukegan, Ill. The suit seeks to have the court order the Johnson Outboards Division of Outboard Marine Corporation to remove, in an environmentally acceptable manner, the sediments from the harbor and to pay a penalty of up to $10,000 a day for each day that PCB's were discharged from the facility. The maximum penalty would be approximately $20 million. The complaint alleges that substantial amounts of the PCB's remain in the sediment as a result of past discharges from the Johnson Outboard manufacturing facility located in Lake Michigan's Waukegan Harbor, over a period of 18 years and resulting in a total discharge of approximately two million pounds of PCB's. The case charges violations of the Clean Water Act of 1977 and the River and Harbor Act of 1899.

REGION 6

Clean Air Meetings With Mayors
Region 6 Administrator Adlene Harrison has held nine regional meetings with mayors and the Texas Air Control Board to improve the involvement of local officials in implementing the Clean Air Act Amendments. Mrs. Harrison

called the meetings to pinpoint the increased emphasis on the participation of local governments. In the meetings EPA staff explained the requirements of the act, the status of individual areas, and the role local governments would take in implementation. In the meetings, Mrs. Harrison said, "We want you to know that we need your commitment to help ensure clean and healthy air. We not only encourage, but also actively solicit your participation in a program to clean up the air."

Sole Source Protection
A public hearing was held in San Antonio in late May to ascertain the possible effects of a housing project proposed for construction on the recharge zone of the Edwards Underground Reservoir. Regional Administrator Adlene Harrison said, "the hearing is part of a review of the proposed project being conducted under provisions of the Safe Drinking Water Act, as the Edwards is a designated sole source aquifer." The Encino Park Venture housing project calls for the construction of 5,480 dwellings on 2,370 acres of land over the next 30 years in four phases. The first phase of over 1,000 dwellings would include single family homes, apartments, and townhouses. The hearings were held in two sessions at LaVillita Assembly Hall in order to accommodate all comments regarding the impact of the project on the aquifer.

REGION 7

Action Line Gets Results
A toll-free telephone line installed by Region 7 to encourage citizen participation has produced results. The calls have covered a range of topics from oil spills to sewers. One call came from Nancy McConnell of Des Moines, Ia., about oil leaking onto her parents' property from a neighboring truckstop. Her complaint was investigated by Bill Pedicino of the Emergency Response Section. He checked with the Iowa Department of Environmental Quality, which confirmed that there was a problem. After inspecting the problem site he determined that oil had accumulated at the truckstop and had been carried by snowmelt into a ditch and from there into a nearby creek. Pedicino instructed the truckstop to commence cleanup activities in the drainage ditch and the creek. The oil was eventually removed at the expense of the truckstop. Mrs. McConnell said she had tried just about everything she could think of to get some help. She said her call to the Environmental Action Line got the job done.

REGION 8

Improving Denver's Air
Members of the Employee Incentives Group in Region 8's Denver Air Task Force met recently with representatives of Federal agencies in the Denver metropolitan area to offer EPA's assistance in developing incentive programs for increased carpooling and use of mass-transportation by Federal employees. The aim of the program is to improve ambient air quality in the area by encouraging less vehicle travel with the resulting reduction in traffic congestion and air pollution. The push to Federal agencies comes because there are approximately 45,000 Federal employees in the metropolitan area and an estimated 62% of them drive alone to and from work. Figures from the Motor Vehicle Manufacturers Association show that in recent years Denver has had one of the highest vehicle registration rates per person and one of the lowest vehicle occupancy rates of any major city in the Nation. The high levels of air pollutants given off by the motor vehicles combine with the weather and the geography of Denver to give the area some of the Nation's dirtiest air as well. Region 8 reports that Denver has had two air pollution alerts so far this year.

Pesticide Action Settled
Region 8 has settled a civil enforcement action against the State of Wyoming that alleges the misuse of the pesticide, COMPOUND 1080®. EPA charged that agents of the Wyoming Department of Agriculture used the chemical for coyote control, despite the fact that it had been registered only for use against rodents. The suit also noted that the State refused to allow inspection of its distribution records as required by law. The State agreed to a court-ordered injunction prohibiting its use of the pesticide on the condition that EPA withdraw its enforcement action.

REGION 9

Advanced Facility Dedicated
Region 9 Administrator Paul DeFalco, Jr., recently took part in the dedication of the new Tahoe-Truckee Tertiary Treatment Facility at Truckee, Cal. The new facility will treat sewage from towns on the California side of the lake. The advanced treatment is necessary on the California side to protect the drinking water sources of the communities that draw from the lake in Nevada.

Environment Management Plan Debated
The General Assembly of San Francisco Bay's Association of Bay Area Governments is meeting this month to decide whether or not to accept a controversial Environmental Management Plan for the nine-county territory. The plan, which took 14 months to develop, uses an across-the-board approach to air quality, water quality, and waste disposal. If adopted it will affect many county and city jurisdictions that now have varying goals, and could serve as a model for similar area governments in other parts of the Nation. While the plan has drawn strong objections, some support for it is being generated as people realize that land-use measures that reduce air pollution can ease the problem of locating new industrial facilities in the area.

REGION 10

Noise Regulations Explained
The Region 10 office has reassured wheat growers in the Pacific Northwest that EPA noise regulations, which took effect January 1, 1978, should not interfere with the use of medium or heavy-duty trucks for harvesting. Some growers feared that the regulations would prohibit modifications of the trucks that are required by local fire marshals concerned about fire hazards in the wheat fields. On some trucks the growers move the exhaust pipes from under the vehicle and run them up the side instead. Such modifications are permitted under the EPA regulations as long as the alterations do not cause violations of the noise standards.

EPA's International Commitment

continued from page 3

waste handling, to cite only a few issues. In order to fulfill its responsibilities, EPA must take its place with other agencies of the government in international forums and collaboration to face these problems. The Agency's role varies: we contribute to policy formation, share responsibilities on international commissions and committees, participate in negotiation of international agreements, serve as members of delegations, and draw on our wealth of scientists and technologists to provide expert advice where requested.

EPA has a rich pool of environmental expertise available to deal with these crucial problems, and these specialists and resources are our greatest asset.

Another goal is to gain as much knowledge as possible from our international cooperation. Our commitments to support the foreign policy of the United States are real and necessary. As one agency among many expected to support the President's initiatives in furtherance of broad national objectives, we will do our part. But our part is technical and scientific, not political, and we must measure the success of any political contribution in technical and scientific terms. It is not in the interest of either party to an agreement that the advantages be one-sided, and we must therefore seek a net balance of scientific and technical benefits from our participation. The more we achieve in professional and institutional satisfaction from our bilateral and multilateral cooperation and the more fruitful the relationship for our foreign colleagues, the greater is our contribution to the political aims that inspired the joint efforts. This does not mean, of course, that every project undertaken by either party to a bilateral agreement will produce equal benefits to both sides. It does mean, however, that we must insistently press for environmental benefits in our exchanges. We must continue to take a hard look at the quality of the information and technology we acquire and weigh it against the resources we commit, seeking to maximize the returns to EPA in order to improve the Agency's capacity to fulfill its domestic mandate.

I have given some goals for EPA's international action, but there is another that is no less important—that of providing leadership. The Agency has a direct responsibility to participate in the international effort to stem the pollution of air and water, to bring toxic chemicals under control, to develop safe and sane handling of radioactive materials, to cope with the problems of solid waste management and to work for the reduction of noise. In the international extension of that responsibility, EPA must play a key role for the United States. We will remain an active member of the U.S. team working toward protection of the environment of this fragile and vulnerable planet. □

The Next Two Years

A Policy Guidance

What will be the top priorities for the Environmental Protection Agency for Fiscal 1979 and 1980? What are the critical items on the agenda, and how can we build on newly expanded legislative foundations during the next two years? Following are the highlights of a Policy Guidance paper approved by Douglas M. Costle, Administrator, and Barbara Blum, Deputy Administrator answering these important questions.

By the end of FY 1980, we believe the Agency can largely finish the job of integration it began seven years ago. We are also confident that, building on our newly expanded legislative foundations, the next two years will be our most productive regulatory period.

In this Policy Guidance to the Agency, we try to define what we think the Agency's priorities should be during these two years. We focus on four major Agencywide areas:

- Protecting public health;
- Enforcing the law;
- Integrating Agency programs and better linking them to State/local agencies and the rest of the Federal government;
- Pressing management and regulatory reform.

We also have included a list of major cross-cutting issues for which we will attempt to develop clear policy guidance over the coming months.

Protecting Public Health

The public is concerned that it is being involuntarily exposed to health risks which ought to and can be controlled. Congress has responded. It has asked us to protect drinking water, to obtain information on chemicals and control those that are harmful, to control hazardous wastes and regulate dangerous pollutants in both air and water. We hope it will soon act to help us in the pesticides area. It has also strengthened our rulemaking and enforcement powers significantly.

The newly expanded and energized Office of Toxic Substances will try to screen new chemicals so that we can act on harmful chemicals before, not after, they have been released into the environment. It will pull together all the Agency's data base on toxic substances and much of the rest of the government's. It will help establish priorities and coordinate the government's information gathering and control activities, and help integrate Agency programs. We expect the Regional Administrators to contribute significantly to this integration effort.

Research and Development is strengthening its health effects work, and our 1979 budget increases our investment in this area. Other commitments include: toxic effluent guidelines and the National Pollutant Discharge Elimination System permit program, designation of hazardous pollutants under the Clean Air Act, review and regulation of pesticides, development of maximum contaminant levels in drinking water, and implementation of hazardous waste regulations.

The public's health is our major priority. Where we are faced with the question as to where to invest resources or to focus our attention, public health protection is clearly our first choice. Even as we elevate protecting the public health in our priorities, as we must, we cannot lose sight of our responsibilities to protect the natural environment and natural systems.

Enforcing The Law

We must enforce the law firmly and skillfully so that every organization we regulate knows that voluntary compliance makes sense—that others are also cleaning up and that, in any case, noncompliance does not pay. Implementing our economic penalties policy, built in part on new powers given us by Congress, is critical. We also must make sure that Federal facilities, very visible symbols to others we regulate, comply with the law. At the same time, EPA must proceed in a balanced, reasonable fashion.

Integrating Environmental Regulation

EPA was created to understand and control the impact man is having on the planet's life support system. Although we have to break this task down into manageable pieces, our research, our rule-making, and even our application of policy will not make sense if we lose sight of the whole. Striking the right balance is one of EPA's central management tasks.

We are addressing those issues on several fronts:

- integrating EPA programs
- integrating Federal, State and local environmental programs
- integrating our programs with those of other Federal agencies

Within EPA

The toxics program will help integrate Agency activities. In addition, our permit programs are now being scrutinized to see if a more unified approach can reduce delays, complexity and uncertainties. We are urging the Regional Administrators as well as State officials to consider *all* environmental dangers involved in regulatory actions, including side effects of control actions such as sludge disposal problems or generation of new effluents.

We are particularly anxious to encourage greater innovation and integration in environmental planning. We will be focusing major attention in the upcoming year on the interaction among EPA planning programs as well as their impact on metropolitan and State land use and growth planning.

State and Local Governments

Local, State, and Federal environmental agencies are working on the same problem. We must work together closely to succeed. The FY '79 budget provides the States and localities strongly increased support, and we hope they will take up many of the responsibilities defined in our new legislation. We are now proposing a flexible consolidated grants program to give the States greater flexibility and to encourage integrated planning. We have asked the Regional Administrators and Assistant Administrators to build State/local government into key EPA decisionmaking processes as much as possible. We will delegate environmental responsibilities to State and local authorities whenever feasible and consistent with national policies.

Other Federal Agencies

We are collaborating with the three other Federal agencies concerned with regulating toxic chemicals on common concerns ranging from testing protocols to regulatory priorities. These agencies are the Occupational Safety and Health Administration, the Food and Drug Administration, and the Consumer Product Safety Commission. We are also working closely with others ranging from the Council of Economic Advisors to the Department of Energy, and with a number of agencies to simplify and coordinate our planning requirements. Also we have worked closely with the White House on a great many issues, such as the development of the Administration's urban policy. We hope we will be able to continue and expand this collaboration over the next two years. We want to encourage Regional Administrators and the Assistant Administrators to pursue opportunities for EPA programs to address urban problems in combination with other Federal programs.

Regulatory And Management Reform

We now have over forty regulatory reforms in process. These include economic incentives as well as regulations, sunset limits on reporting requirements, timesaving modifications to adjudicatory hearing procedures, and increased and more effective public participation. We hope the Agency's managers and staff will find more.

We also have begun management reforms to improve the effectiveness of EPA's decisionmaking built around our Steering Committee and Zero Based Budgeting. We want to develop strategies to clearly assess our progress and reorient our programs in support of our priorities. An improved system of planning and managing for our research and development program will help to assure that it is of high quality and fully supports our regulatory efforts. The Management Task Force will continue to play a leading role in the improvement of agency management.

A number of other efforts now underway will result in new policies that will affect Federal, State, and local environmental programs. These include:

- Cancer policy (being examined by the Interagency Regulatory Liaison Group as well as by the Offices of Research and Development and Toxic Substances).
- Issues involving energy/environmental tradeoffs (being considered by the EPA Energy Policy Committee).
- Specific urban initiatives in addition to those being developed for the Cabinet's Urban and Regional Policy Group.
- A plan for greater public participation and awareness.
- A series of industry-specific strategies (steel, auto, etc.)
- Consideration of the costs and benefits of our programs.
- Affirmative Action programs.

We have tremendous opportunities; all we need is imagination and drive to take advantage of them. □

Copies of the complete text are available by writing EPA Journal (A-107), EPA, Washington, D.C. 20460.

region 6 Report

By Adlene Harrison
Regional Administrator

As I sit behind the desk I use as Administrator of Region 6, I can't help but reflect on the irony of my position. I am suspended twenty-seven floors above the pavement, surrounded by the steel, concrete, and glass that symbolize our urban society. I am housed in the tallest building in Dallas, Texas, and yet my commitment reaches to include a complex mix of mountains, plains, and coastline. My situation demonstrates the condition of most Americans. Since I am drawn to the vitality of the city like millions of others all over the United States, I must accept the responsibility for what this human gathering-together ultimately calls for—environmental protection.

From the safe isolation of my city office building with its recirculated air, I often see the morning sun filter through a haze of smog that Dallas never knew when I was growing up here. At night from this same window I see the spread of lights stretch to the north across the lands that I knew as pasture. It is all a part of progress, and I know that growth is the alternative to stagnation and decay . . . but we must have a planned growth.

From my childhood, I remember experiencing nature as a source of inspiration, and perhaps it is those memories that have led me again and again to take up the cause of protecting our environment. I am an environmentalist because I feel an overwhelming commitment to protect the public health, to guard the delicate balance of nature's systems and to preserve the transcendental impact that nature has on the spirit of mankind.

I am an environmentalist because for me there is no other possible choice. It is this firm and resolute philosophy that enables me to deal with the frustrating and multifaceted problems of being a Regional Administrator of the Environmental Protection Agency.

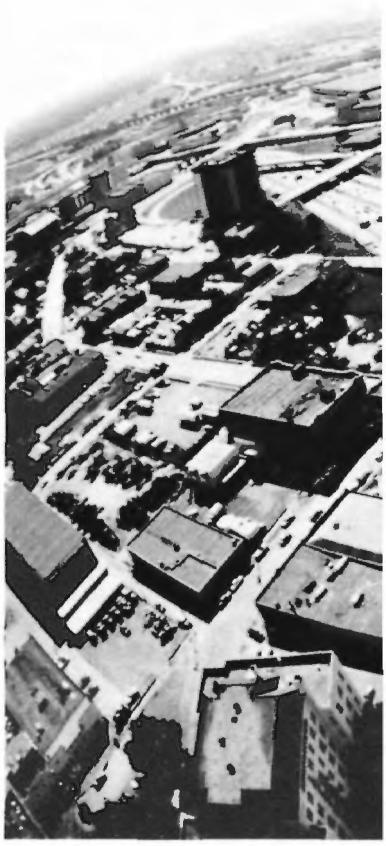
In the beginning nature threatened people, but today those roles have been reversed. The five-State area of Region 6 is a part of this Nation that was born of a pioneer mentality, a fierce determination to conquer and harness the land. These goals have been accomplished with a spectacular thoroughness. Today's determination must be to achieve a balance between use and abuse.

Indeed nature is no longer a threat to people, but the loss of nature certainly is.

When I took the oath of office last September, I felt a strong sense of obligation to do my best and to enforce the laws under which the Environmental Protection Agency operates. As a member of the Dallas City Council, I had long been involved in making laws. Now it was my task to see that the laws of the land were enforced. On my very first day in office, I made it quite clear that I wanted a strong enforcement team to carry out a firm policy with equal treatment for all and favors for none.

Since it is my opinion that no organization can cooperate effectively with outside agencies and individuals until it can communicate and function well internally, I have made a number of structural changes within the Agency to help us see what our problems are and learn how to solve them.

We have taken a major step by establishing two new offices, an Office of Environmental Policy and an Office of Energy Policy. We have filled both of these offices with members of the staff on a one-year rotation plan that gives mid-level employees the opportunity for intensive management and policy training development. This program will also give staff members an opportunity for personal growth that will qualify them for positions of greater responsibility within the Regional Office.



The Office of Environmental Policy will give us a better handle on many of the complex issues confronting us in this region. These issues, many and varied, are largely peculiar to our five-State area. Many of them require special study and handling. Likewise, the Office of Energy Policy will enable us to establish closer ties with the energy industry and with our five States, which produce a major portion of the Nation's oil and gas.

We have reorganized our public awareness function to improve our response to requests from the public in general and the media in particular. Since I prefer action to reaction, we are setting up our systems to make this possible.

My assistant, Ed Grisham, has overall responsibility for the Office of Public Awareness, as well as the Offices of Environmental Policy, Energy Policy,

An aerial view of the Central Expressway, Dallas, Texas.

and Congressional and Intergovernmental Relations. To improve our dissemination of information, we have created the Information Development Branch with responsibilities for publications, films, slide talks, brochures, pamphlets, fact sheets, and other informational services.

Environmental education, like all education, must begin when a child is young. We know that a child looks at a leaf or a flower with a special sense of wonder that adults sometimes lose, so it is only natural for us to expand on this existing sensitivity to nature. I have instructed our staff to establish a school curriculum for teachers, using our publications and other teaching aids. If we can educate our children on the importance of preserving the environment and keeping it clean, then we will have generations who have internalized these goals and who will work to bring them to fruition.

Adlene Harrison

Along with the rapid progress in our own Agency, I have also been enormously encouraged by the developing relationship between our Agency and the States with whom we deal. One of the first things I did as Regional Administrator was to become acquainted with State agency people. This action has paid great dividends, as I know there is no substitute for personal contact and a frank discussion of problems. We have been able to establish what I hope will be long-lasting channels of communication, which represent a healthy give-and-take between State and Federal Government.

To give an example of our working relationship with the States on all levels, one of the most exciting things to happen in Region 6 is the Federal-to-State delegation of responsibilities. We are quickly moving in this direction with the prospect that the States will soon be managing their own affairs, a position where they rightfully belong under most of the environmental laws.

By next October, I expect to have agreements in principle with each of our States, with timetables for the States to manage construction grants under Section 205 of the Clean Water Act. Section 205 authorizes EPA to reserve up to 2 percent of a State's annual allotment for the State to administer certain aspects of the water program. Preliminary interviews indicate Region 6 States will manage a share of the program beginning with fiscal year 1979. This should streamline the program, remove red tape, and speed the processing of grant applications.

For several years Region 6 has been laying groundwork for States to take over administration of the National Pollutant Discharge Elimination System (NPDES) program. We have had energetic response from Texas, Arkansas, and New Mexico, although only Texas and Arkansas have obtained enabling legislation from their respective legislatures. By working with EPA in the permit program, the States have moved closer to actual delegation of the permit administration authority, and we expect Texas to be in a position to assume full responsibility in a matter of months.

Of all the permits issued by the Region since the program began six years ago, about 4,000 are now in effect. The permits set out effluent limitations and monitoring requirements for some 1,600 municipal and 2,400 industrial facilities. Region 6 has plans to issue some 376 major permits in fiscal 1978, including some of the 600 permits that have expired and must be re-issued.

We are working closely with the States in the preparation of State Implementation Plans for overall implementation of the 1977 Clean Air Act Amendments. Through a series of meetings, we are acquainting mayors and other local elected officials with what must be done to meet air standards on schedule. While full responsibility falls upon the State and local officials, the air program gives EPA the perfect opportunity to work with the States, encouraging them into a more active role.

A cooperative Region 6 and State relationship developed in two instances involving use of the offset emission policy in two areas, Shreveport and Oklahoma City, that did not meet air quality standards. In both of these instances we were able to obtain the necessary reductions from other pollution sources to permit operation of General Motors plants. We did this by working with a combination of State and local officials, plant representatives, chambers of commerce, and officials of other industrial concerns.

It was certainly not an easy process. We were all involved in long meetings with rigorous discussions, but we won a mutual accomplishment. The outcome demonstrated that under the Clean Air Act there can be industrial growth without a sacrifice of air quality.

Region 6 States were among the first in the Nation to assume enforcement responsibility under the Safe Drinking Water Act. State leadership in the program required extensive groundwork on both the part of EPA and the public. In New Mexico, for instance, we prepared and distributed a television spot featuring the racing car driver from Albuquerque, Bobby Unser. A television show and a series of press releases were also used to acquaint New Mexicans with their drinking water situation and what was necessary to protect the public health. EPA grants to the States are used to fund up to 75 percent of the overall costs of administration, program development, enforcement, training, monitoring, public participation, and other aspects of the Safe Drinking Water program.

As authorized under the Federal Insecticide, Fungicide and Rodenticide Act, we are making grants to the States for enforcement of pesticide regulations, leaving EPA in a role of supervisor. We have approved grants totalling about $700,000 for New Mexico, Texas, and Oklahoma.

While the Toxic Substances Control Act does not delegate primary responsibilities to the States, Region 6 expects to make first-year demonstration grants that will move the program as regulations are promulgated. In keeping with Congressional intent under the Resource Conservation and Recovery Act of 1976, all five Region 6 States are expected to seek primacy for conducting both hazardous and municipal waste management programs. We feel optimistic that our States will meet the requirements of the regulations so that waste management will be conducted efficiently at State and local levels with EPA financial and technical assistance.

The fact that we have gone far in our development of working relations with the States should not, however, indicate that we have been in agreement on all things. We had a difference with the State of Texas over implementation of the emission offset provisions of the Clean Air Act Amendments of 1977. The Texas Air Control Board applied for a waiver, but could not qualify in our judgment. We had numerous meetings and telephone conversations with the Board, its staff, and other State officials seeking a solution to this situation, but to no avail. Finally I made a decision to withdraw EPA grant funds in the amount of $2 million if the Texas board refused to implement emission offsets. We sought repeatedly to convince State officials that the air pollution situation in Texas could be better served if the State assumed the offset emission responsibility.

After weeks of negotiation, the impasse was broken and the board agreed to implement the law. We restored the $2 million grant.

One learns very quickly when put on the firing line, and after taking office I encountered a major problem involving wastewater in Jefferson Parish, Louisiana. An investigation started by the United States Attorney in New Orleans began a chain of events that culminated in several Federal indictments and a reshuffling of the procedures by which the Parish was handling its wastewater funds. In the wake of these exposures, EPA ordered an audit of its $1,899,995 Step One grant for a $160 million East Bank wastewater treatment system, and subsequently terminated the grant pending adjustments involving contractors and subcontractors hired for phases of the project planning.

We held a press conference in Jefferson Parish in December disclosing our audit findings and our decision to terminate the grant until such time as Jefferson Parish got its house in order. We made it clear that if EPA had made a mistake in its grant procedures, we would gladly correct it. Our sole aim was to clear the way for funding the badly needed project as quickly as possible. In addition, we ordered the Parish to bring into compliance all wastewater units found in violation of their NPDES permits.

Drilling off the coasts of Louisiana and Texas, which is accelerating under the demand for more oil, points up the need for greater protection of our coastline and Gulf waters. The Agency last year completed studies on proposals by major oil company consortiums to build deepwater offshore terminals for unloading oil from supertankers too large for existing ports. Seadock, the terminal proposed for a site off the Texas coast, was involved in a controversy between the companies and government agencies, resulting in withdrawal of plans. Subsequently, the Governor of Texas appointed an Authority to look further into Seadock as a State project. It is the position of EPA that both projects can be designed to meet air and water pollution regulations.

Although the total number of oil and hazardous substances spills was about the same as recorded for each of the previous four years, the number of major category spills (greater than 10,000 gallons) has been reduced more than 50 percent from the fiscal 1974 reporting period. About 1,450 facilities were inspected for compliance with oil pollution prevention regulations under the Spill Prevention Control and Countermeasures Plans. This year Region 6 expects to increase its capabilities to respond to hazardous substances spills, finalize a revised Regional Contingency Plan, and continue vigorous efforts in the spill prevention program.

Along with the challenges that I faced when becoming Regional Administrator, I also found encouraging signs that our efforts have brought forth positive results. The cleanup accomplishments involving the Houston Ship Channel and the Gulf of Mexico constitute two of the Region's foremost success stories. No longer are toxic chemical wastes dumped into the Gulf of Mexico. Some are burned at sea aboard special incineration ships and some are being incinerated in land-based company facilities.

Recently Deputy Administrator Barbara Blum and I made a boat trip down the Houston Ship Channel to observe the progress, and I was genuinely impressed with what I found. Obviously we have a long way to go before fish crowd the Houston Tidal Basin or birds flutter around the industrial smokestacks, but at last we are going in the right direction.

Another of my concerns is the need for better protection of the wetlands along the coasts of Texas and Louisiana. These wetlands constitute our last frontiers of ecological quality, and I hope that we will be able to increase our manpower for better surveillance and protection of these areas under Section 404 of the Clean Water Act.

In my job as Regional Administrator, I am faced daily with problems of great intricacy. No one claims that the answers to these problems will be swift or easy. It is my responsibility to listen, to respond, and to anticipate ways to meet the environmental needs of Region 6.

Region 6 is not merely a combination of lines on a map designating a five-State area. Region 6 is a body of human beings who deserve clean air, pure water, and a land preserved for their descendants. It is people, always people, who are my prime consideration and the continuing impetus guiding me to tackle the large and human concerns of EPA. □

People

Joseph Muskrat
He has been appointed General Counsel for Region 8. His previous government service was with the Department of Energy, and its two predecessor agencies, the Energy Research and Development Agency, and the Atomic Energy Commission since 1974. His positions with those agencies included attorney in the Office of Counsel in Los Alamos, N.M., the Office of General Counsel in Albuquerque, N.M., and the Office of General Counsel in Washington, D.C. Muskrat received a B.A. from the University of Oklahoma in 1962 and a J.D. from that institution in 1964.

Nicholas DeBenedictis
He has been appointed in Region 3 as the Director of the new Office of Intergovernmental Relations and Public Awareness. DeBenedictis has been with EPA since 1973 as Water Permits Coordinator for Pennsylvania, Section Chief of Air Enforcement for Stationary and Mobile Sources, Congressional Affairs Officer, Federal Regional Council Liaison and Executive Assistant to the Regional Administrator, all in Region 3. His previous service was with the U.S. Army Corps of Engineers, Philadelphia District, as Public Relations/Environmental Officer. DeBenedicts received a B.S. degree (summa cum laude) from Drexel University in Commerce and Engineering and Sciences.

Frances Irvin Wilkins
She has been appointed Director of the Office of Civil Rights and Urban Affairs for Region 5. Her previous government experience includes serving as Regional Equal Employment Opportunity Officer for the General Services Administration in the Midwest from 1975-1978. She served as an equal opportunity specialist with the Department of Defense Office of Contract Compliance from 1970 to 1975, and as an Industrialist Specialist with the Directorate of Production from 1968 to 1970. Wilkins received a B.S. in management from the University of Illinois, Circle Campus in 1967.

Assistant Administrator David Hawkins addressed area bikers on the Mall during Bike Days in April. Hawkins told the assembled enthusiasts that when he first came to work at EPA he had a free parking space at his disposal, but he had to get on a waiting list for a bicycle locker. He added that his job is to control air pollution and noise and that bikers can help. Hawkins told the crowd that bikers can get involved in State and local plans to meet clean air standards under the Clean Air Act Amendments of 1977. He emphasized that cutting down on auto pollution is the only way some areas will be able to meet the standards. Other activities in the Washington, D.C. area during Bike Days included a bicycle race, bike registration, a rodeo, and a petition to President Carter asking for more support for biking as an alternative form of transportation.

Update

A listing of recent Agency publications and other items of use to people interested in the environment.

General Publications

EPA Publications, A Quarterly Guide. April, 1978. This 235-page book covers EPA publications from January-December 1977. It contains a listing of technical publications by title and by subject. General interest publications are grouped according to the EPA program they relate to. The book contains ordering information and forms.
Copies of the Guide are available from Printing Management Office (PM-215), EPA, Washington, D.C. 20460.

Federal Register Notices

Copies of Federal Register notices are available at a cost of 20 cents per page. Write Office of the Federal Register, National Archives and Records Service, Washington, D.C. 20408.

Toxic Substances Control
EPA clarifies inventory reporting regulations. pp. 16178-181 in the April 17 issue.

Water Pollution
EPA announces availability of "Development Document for Proposed Existing Source Pretreatment Standards for the Electroplating Point Source Category." p. 16517

Pesticide Programs
EPA reports on pesticide ingredients considered for scientific review under rebuttable presumption against registration. pp. 16807-808. April 20 issue.

Regulations Under Consideration

The following rules are being developed by EPA. The Agency encourages public comment. EPA contacts and proposed issuing dates are listed so that interested persons can make their views known. These rules will be issued in July and August:

A regulation to establish procedures for submitting premarket notices to EPA for all new chemicals under the Toxic Substances Control Act, write or phone Blake Biles (TS-794), EPA, Washington, D.C. 20460 755-5483.

A regulation to set noise emission standards for new pavement breakers and rock drills. Write or phone Kenneth Feith (AW-490), EPA, Washington, D.C. (703) 557-2710.

A review of construction grant regulations to make technical and administrative changes based on operating experience with the existing regulations. Write or phone Joe Easley (WH-547), EPA, Washington, D.C. 20460. (202) 426-4445.

A regulation to set performance standards for particle emissions from new glass manufacturing furnaces. Write or phone Don Goodwin (MD-13), EPA, Research Triangle Park, N.C. 27711. (919)541-5271.

A regulation to require States to adopt water quality criteria for substances that the Administrator has determined have a significant adverse effect on human life and animal health. Write or phone Ken Mackenthun (WH-585), EPA, Washington, D.C. 20460. (202) 755-0100.

News Briefs

AMC Ordered to Recall Most '76 Vehicles

EPA has ordered the American Motors Corporation to recall most of its 1976 model vehicles for exhaust system repairs. Deputy Administrator Barbara Blum in a press conference at the Agency's new auto testing laboratory in Springfield, Virginia said EPA was requiring AMC to recall about 310,000 cars and trucks "because these vehicles spew excess amounts of nitrogen oxide pollution into the air we breathe." The problem involves a faulty joint in the exhaust pollution control system. Ford Motor Co. earlier was ordered to recall a number of vehicles with a similar defect.

States Served by EPA Regions

Region 1 (Boston)
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
617-223-7210

Region 2 (New York City)
New Jersey, New York, Puerto Rico, Virgin Islands
212-264-2525

Region 3 (Philadelphia)
Delaware, Maryland, Pennsylvania, Virginia, West Virginia, District of Columbia
215-597-9814

Region 4 (Atlanta)
Alabama, Georgia, Florida, Mississippi, North Carolina, South Carolina, Tennessee, Kentucky
404-881-4727

Region 5 (Chicago)
Illinois, Indiana, Ohio, Michigan, Wisconsin, Minnesota
312-353-2000

Region 6 (Dallas)
Arkansas, Louisiana, Oklahoma, Texas, New Mexico
214-767-2600

Region 7 (Kansas City)
Iowa, Kansas, Missouri, Nebraska
816-374-5493

Region 8 (Denver)
Colorado, Utah, Wyoming, Montana, North Dakota, South Dakota
303-837-3895

Region 9 (San Francisco)
Arizona, California, Nevada, Hawaii
415-556-2320

Region 10 (Seattle)
Alaska, Idaho, Oregon, Washington
206-442-5810

Redefining National Security

continued from page 15

world population growth has led to an 11 percent decline in the per capita catch and to rising prices for virtually every edible species.

The Earth's grasslands too are under growing pressure. The products originating from the six billion acres of grassland play an important role in the food, energy, and industrial sectors of the global economy. Overgrazing is not new, but its scale and rate of acceleration is unprecedented. Deterioration that once took centuries is now being compressed into years by inexorable population growth.

Forests have proved to be one of humanity's most valuable economic resources and, in consequence, to be one of the most heavily exploited. Almost every country undergoing rapid population growth is being deforested. If cutting is excessive, forests shrink and their capacity to satisfy human needs diminishes. Most of the Middle East and North Africa and much of continental Asia, Central America, and the Andean regions of South America are now virtually treeless. In these denuded areas, wood and wood products are scarce and expensive. What is worse, the remaining forested area in all these regions except eastern Asia, principally China, is shrinking.

Croplands produce an even greater variety of products. The proportionate contribution of cultivated crops to the global economy is far greater than the one-tenth of the Earth's land surface that they occupy. However, in the case of croplands as well, it appears that biological carrying capacities are being reached and exceeded.

As world population gradually expanded after the development of agriculture, farming spread from valley to valley and from continent to continent until by the mid-twentieth century the frontiers had virtually disappeared. Even while the amount of new land awaiting the plow shrank, the growth in demand for food was expanding at a record pace. Coupled with the uneven distribution of land in many countries, these trends have engendered a land hunger that is driving millions of farmers onto soils of marginal quality—lands subject to low and unreliable rainfall, lands with inherently low fertility, lands too steep to sustain cultivation.

Apart from the loss of cropland, erosion on remaining cropland is undermining soil productivity. A natural process, soil erosion as such is neither new nor necessarily alarming, but when erosion outpaces the formation of new soil, inherent soil fertility declines. It is the rate of soil erosion that distinguishes the current era from other periods. The result has been a gradual but potentially disastrous decline in productivity in many parts of the world.

During the early seventies world food consumption steadily outstripped production leading to greater global food insecurity than at any time since World War II. Declining food stocks led to soaring prices, export embargoes and the emergence of a global politics of food scarcity As the world price of wheat climbed so did death

rates in a dozen or more low-income countries, including among others India, Bangladesh, Ethiopia, Somalia, and the Sahelian zone countries of Africa. The lives claimed by the increase in hunger during the seventies may have exceeded the combat fatalities in all the international conflicts of the past two decades.

While stocks have been rebuilt somewhat as the result of uncommonly good harvests in 1976 and 1977, they are still far from adequate. Preliminary estimates indicate the carryover for 1978, including both the stocks of grain and the grain equivalent of idled U.S. cropland, amounts to only 53 days of world consumption, far less than the 62 days held in 1972, when poor crops in the Soviet Union, India, and several smaller countries, wiped out food reserves almost overnight.

The present trend is even more frightening in that the modern world shows a more one-sided dependence on one geographic area than at any time in the past. Since World War II every continent except North America has become food-deficient, a situation that is leading to political and economic difficulties even beyond the obvious threat of famine for much of the world. As the threads of the global food network have been stretched ever thinner, the result has been growing insecurity for the rich nations as well as for the poor, and for the exporter of grains as well as the importer.

History has recorded a few instances of such abuse. North Africa was once the granary of the Roman Empire. Today, the fertility of the region's badly eroded soils has fallen so low that the area imports much of its food. Accounts of the collapse of the early Middle Eastern civilizations attributed their downfall to invaders from the north, but more recent investigations link their decline to the waterlogging and salting of their irrigation systems and to the collapse of their food supplies. For the modern world community, the prospect is equally threatening. Ultimately, efforts to preserve the biological systems on which humanity depends must involve constraints on global consumption which for many nations will require a reordering of social and economic priorities.

Few would doubt that economically the seventies have been traumatic and confusing. Both in the petroleum and food markets, the slack appears to have gone out of the world economy, leaving the entire world in a highly vulnerable position. Accompanying the new global economics of scarcity has been a growing capital shortage that is plaguing the citadels of capitalism and socialism alike. Furthermore, the seventies have brought the first global double-digit inflation on record during peacetime and the highest unemployment since the Great Depression.

The most significant aspect of the present economic trends is their pervasiveness, which seems to presage a period of increasing economic stress for the world as a whole. Increases in population and in the standard of living have begun to press up against the capacity of global markets to respond. Both in the case of renewable and nonrenewable resources, it will be extremely difficult for world supply to keep pace with the phenomenal growth in demand that is forecast for the coming decades.

During the seventies world demand for food simply outstripped the capacity of farmers to expand supplies of wheat and other commodities at historical price levels. Matching the rises in the prices of food staples, the prices of lumber and firewood have doubled and even tripled. Although the sharp climb was commonly attributed to the global surge in economic expansion of the early seventies, the subsequent cessation of economic growth during the mid-seventies did not bring prices down. The "ratchet effect" that seems to be operating here suggests strongly that it is the overall relationship between the level of demand and the sustainable yield of resources—and not the short-term shift in demand—that counts.

Global scarcities have affected not only prices but employment as well. If new employment is to be created, there must be something for people to work with. For the half or so of the global labor force in agriculture, that "something" is land. As long as frontiers existed, employment could be created with trifling amounts of capital—with that needed to buy crude farm implements and seed. But now that land suitable for settlement has become scarce, new agricultural jobs are increasingly difficult to find. In industry as well, the raw materials that are essential for production are becoming scarce in many sectors, and the resulting rises in prices have contributed to many layoffs.

These economic threats to national security are incompletely understood, but even the most optimistic economist must admit that the trends of the early seventies if continued indefinitely might prove disastrous. Economic stresses can quickly aggravate social divisions, turning political cracks into fissures. When German Chancellor Helmut Schmidt was his country's Finance Minister in early 1974, he voiced his concern: "I only have to go to the years 1931 and 1933 to say that the meaning of stability is not limited to prices."

The new threats to national security are extraordinarily complex. Ecologists understand that the deteriorating relationship between four billion humans and the Earth's biological systems cannot continue. But few political leaders have yet to grasp the social significance of this unsustainable situation. Unfortunately, nonmilitary threats to a nation's security are much less clearly defined than military ones. They are often the result of cumulative processes that ultimately lead to the collapse of biological systems or to the depletion of a country's oil reserves. These processes in themselves are seldom given much thought until they pass a critical threshold. Thus, it is easier in the government councils of developing countries to justify expenditures for the latest model jet fighters than for family planning to arrest the population growth that leads to food scarcity.

The continuing focus of governments on military threats to security may not only exclude attention to the newer threats, but may also make the effective address of the latter more difficult. The heavy military emphasis on national security can absorb budgetary resources, management skills, and scientific talent that should be devoted to the new nonmilitary threats. Given the enormous investment required to shift the global economy forward to alternative energy sources, one might well ask whether the world could afford the sustained large-scale use of military might of the sort deployed in World Wars I and II. In effect, there simply may not be enough fuel to operate both tanks and tractors.

In a world that is not only ecologically interdependent but economically and politically interdependent as well, the concept of "national" security is no longer adequate. Though national governments are still the principal decisionmakers, many threats to security require a coordinated international response. Whether the immediate crisis involves firewood shortages in the Third World or double-digit inflation in the industrial countries, they will be increasingly influenced by a global net of forces which no nation can expect to control unilaterally.

The purpose of national security deliberations should not be to maximize military strength but to maximize national security. In the later twentieth century the key to national security will be sustainability. The times call for efforts to secure the global systems on which nations depend. Perhaps the best contemporary definition of national security is one by Franklin P. Huddle, director of the U.S. Congressional study, *Science Technology and American Diplomacy*. In *Science*, Huddle writes "Security means more than safety from hostile attack; it includes the preservation of a system of civilization." At some point governments will be forced either to realign their priorities in a manner responsive to a changing world or to watch their national security deteriorate. □

Global Monitoring

continued from page 8

may be a complex mix of human activities and natural processes. Moreover, the time lag between cause and effect in the case of degradation of soil or plant life may be significantly longer than time scales in pollution processes.

In 1978 we look upon monitoring against the background of the Sahel disaster, the energy crisis, and, in the technology field, the wide applicability of the resource of the Landsat satellites. The Sahelian disaster and the energy crisis led us to reconsider the fragility of our natural ecosystems and the interdependence of nations. The Landsat technology has provided a means by which vast areas of natural resources in the developing world may be economically monitored.

Thus GEMS has developed from its pollution-oriented beginnings to its present state in which a balance has been struck between natural resource monitoring and pollution monitoring. It has become quite obvious that one of the main areas we should be looking at is the world's natural resources, particularly forests and rangelands in developing countries.

The monitoring of pollutants can be most easily understood by looking at health-related, climate-related, and ocean monitoring activities separately.

Recently, a government expert group in Geneva looked at the whole range of GEMS health-related monitoring, which consisted of air quality monitoring in urban areas, the monitoring of water quality on a global scale and the development of a worldwide human food and animal feed contamination monitoring program. The group recommended several activities designed to assess more accurately actual human exposure. It suggested that such exposure to sulphur dioxide and other gaseous pollutants as well as particulates be monitored, and that biological monitoring of human tissues and body fluids be carried out for certain heavy metals (lead, cadmium, and mercury) and selected organochlorines.

In the field of climate and climate variability, certain parts of the World Meteorological Organization's World Weather Watch are part of GEMS, broadly speaking. In that part of the Weather Watch that deals with the monitoring of carbon dioxide in the atmosphere and the chemistry of precipitation at background levels (baseline and regional stations) there has been active cooperation between UNEP and WMO since 1974, which has resulted in a substantial increase in the number of stations. With GEMS financial incentives 12 regional stations in ten developing countries have been equipped with instruments. The possibility of a baseline station on Mount Kenya also is being investigated.

Ocean monitoring is extremely important. If the oceans are indeed's man's last great natural resource—and there is every reason to consider them so—we need to husband them carefully, both in coastal waters and in the open seas. GEMS is aware of the problems of open ocean pollution and has, again with the help of government experts, come up with an international program proposal, which is being considered. Coastal waters have also claimed considerable attention, and the UNEP-coordinated Mediterranean Pollution Monitoring and Research Program has been well publicized. GEMS has also been involved in a pilot project monitoring oil pollution along some of the main shipping lanes. However, one important aspect of ocean pollution that has not yet been adequately addressed is the fall-out of pollutants from the atmosphere. This extremely important aspect will also have to be seriously considered.

GEMS has been concerned, as already noted, with the depletion and degradation of natural resources. As a result of a government expert group meeting in Rome in March, 1976, a coordinated program for the monitoring of soil and vegetation cover has been developed. One pilot project on tropical forest cover monitoring is already under way in West Africa. This will be shortly joined by a pilot project on tropical rangelands so that the methodologies, vegetation classifications, and logistics of monitoring a cross-section from the humid forest to the desert edge will be solved. Experience thus gained can then be applied to other tropical regions. Already in the soil area, maps of actual and potential soil degradation are being prepared for Africa and maps for the rest of the world will follow.

It should be emphasized that GEMS is only one component of UNEP's Earthwatch program for global environmental assessment. For 1978 and 1979, Earthwatch will have an operating capital of $8.96 million, of which less than half will go to PAC. The PAC seed money—about $2 million a year—is mainly channeled through the various United Nations specialized agencies to encourage national action and cooperation in all monitoring fields. It is abundantly clear that if GEMS is to work properly, national efforts and expenditures will have to be many times the expenditure of the United Nations. One cannot hope to monitor the world with $2 million a year. In this respect PAC reflects the role of UNEP itself, which is coordinating and catalytic, using for these purposes only limited financial resources. □

US-USSR

continued from page 17

In another area of concern, in light of U.S. balance of payments problems, American firms have sold several million dollars worth of environmental protection equipment to the U.S.S.R. This market is likely to grow as the Soviets' investment commitment to the environment grows. Two commercial exhibits under the auspices of the U.S.-U.S.S.R. Environmental Agreement have been held in Moscow to promote the sale of American products in this field. The Department of Commerce will hold another such exhibit in the Soviet capital this month.

Finally, this Agreement—as well as the 10 other bilateral agreements we have with the U.S.S.R. in various scientific and technical fields—plays an important human and political role. Through such exchanges, several thousand leading Soviet scientists and administrators have become exposed to American life and ways of thought. Many of these Soviets have acquired a professional commitment to cooperation with their American counterparts. This is an important avenue of influence into what is still, despite some openings in recent years, a largely closed society. Since the people being reached by the environmental and other agreements with the U.S.S.R. are highly influential within their own country, the ideas and approaches they bring to their work will often bear an American imprint. It should also be remembered that through these exchanges many Americans have experienced the depth and richness of the Russian and other ethnic cultures of the U.S.S.R. and have enjoyed warm personal relations with their Soviet hosts. After many years of suspicion and distrust, such contact helps build the basis for a more open and stable U.S.-Soviet relationship in the future. □

Administrator Douglas M. Costle watches as President Carter and Deputy Administrator Barbara Blum present award to Steven Mensing of Beckemeyer, Ill. for his work in helping to clean up Beaver Creek near his home. In the background are other youngsters who received the President's Environmental Youth Awards in the recent ceremony in the White House Cabinet Room.

The President said that the efforts by these youngsters and some 70,000 others across the country who participated in the program last year will help cut down on "the violations of the law and the violations of the purity of the air and water and earth that God gave us in our beautiful country." President Carter said that the program is "a very notable and worthwhile effort." The President added that "the whole thrust of this effort is to encourage young people to participate, to analyze how they can contribute to the quality of life around their own homes in a practical way, not just a theoretical way, and to let the judgment of how successful they are be determined by those who live in the community itself." Anyone interested in more information about this program can write the President's Environmental Youth Awards (A-107), U.S. Environmental Protection Agency, Washington, D.C. 20460

Back cover: Women at work building a road in the mountains of Asia.

United States
Environmental Protection
Agency
Washington DC 20460

Official Business
Penalty for Private Use $300

Postage and Fees Paid
Environmental Protection Agency
EPA 335

Third Class
Bulk

U.S.MAIL