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World Environment Report . . .

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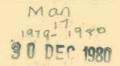


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SPECIAL REPORT

Israel's army is invading its last wilderness, the Negev

JERUSALEM—Israel's only wilderness, the Negev Desert, is in danger. This ecologically sensitive region, some 50 percent of Israel, is threatened by the redeployment of Israel's Defense Forces (IDF) from the Sinai Peninsula to the Negev as part of the Israel-Egypt treaty.

Within its 12,000 square kilometers, the Negev is rich in variety. Ecologically the meeting point of several desert systems, it is rich in flora and fauna. Topographically, the Negev presents a wide variety of land forms ranging from wide plains to sand dunes and rocky hills. Its elevations vary from 1000 meters above sea level to 400 meters below the Dead Sea, the lowest point on earth.

Israel's major environmental bodies—Nature Reserves Authority (NRA), Society for the Protection of Nature in Israel (SPNI) and the Environmental Protection Service (EPS)—have mobilized to ensure its survival under the new military reality.

One major fear is that redeployment, with its attendant development of a new infrastructure of military bases, firing and maneuvering grounds, airports, etc., will endanger nature conservation efforts in the Negev. Therefore, side by side with negotiations between Israel and Egypt, environmentalists and the IDF have been carrying on intensive negotiations.

One controversial issue was an area planned as a wildlife reserve by the NRA and as a training/firing ground by the IDF. Following lengthy negotiations, a compromise solution was reached providing the army with essential training grounds while enabling establishment of a 10,000-hectare wildlife reserve and a breeding and research center for endangered desert species.

According to Giora Ilani, chief zoologist of the NRA, the need for such a wildlife reserve was critical even before redeployment. Additional pressures expected to result from the army's requirements will make the reserve the only alternative to extinction for such species as the lappet-faced and bearded vultures, and the Dorcas gazelle which subsists on the leaves and fruit of the acacia tree. Unfortunately, acacias grow in areas best suited for military

In the Middle East ...

THE KUWAIT ACTION PLAN is underway with the return of a seven-person survey team from participating countries surrounding their regional seas. Team reports cover the initial phase of 10 projects—a survey of national capabilities in fields relevant to environmental protection and enhancement, i.e., management, information centers, legislation, sources of waste and pollution. Implementation of the projects should begin early in 1981.

A DESERT ECOLOGY CENTER was inaugurated on October 20 in Sde Boker in the southern arid region of Israel. The center, planned to operate within the framework of the Desert Research Institute affiliated with Ben-Gurion University of the Negev, will concentrate on three major topics: impact on the desert from redeployment of Israel's defense forces in the Negev as part of the peace process, impact on the environment from establishment of an industrial chemical center in the Ramat Hovav region, and development of agricultural methods designed for arid zones.

REVERSE OSMOSIS PURIFICATION PLANTS which treat both sea and well water have been set up in Jeddah and Jubail, Saudi Arabia. These plants purge the water of dirt and reduce mineral salinity. Unwanted brine is kept underground until tankers carry it to a remote dumping area. The Ministry of Agriculture and Water checks specifications and does periodic sampling. Output in the Jeddah plants has risen from 500 liters to 6,000 liters a day.

DRACONIAN PUNISHMENTS ENFORCE the ban on tree cutting in Saudi Arabia. Said Ahmed Saweed Al-Ghamdi, head of the forestry and national parks division of the Ministry of Agriculture and Water, has meted out three-month jail sentences and a fine of SR1,000 (\$300) for each tree cut. National tree planting days in Jeddah, Dammam and Dhahran have increased the urban greenery in the kingdom. The Ministry of Agriculture in Asir Province has specified reforestation as one of its objectives as this province, which has more than half the cultivable land in the country, has suffered drought for the past five years.

A HUNDRED MILLION TON ICEBERG is to be towed next year from the Antarctic to Saudi Arabia, the magazine Saudi Business reported. Prince Muhammed Al-Faisal estimated the cost to be around \$100 million and said that a ton of iceberg water could be delivered to Jeddah for less than a tenth the cost of desalinated water.

maneuvers. Still other species, almost totally extinct in neighboring countries but flourishing in Israel, such as the ibex, will almost surely be affected by the military reorganization and will require additional supervision and protection.

Yossi Leshem, an ornithologist heading the Nature Protection Department of SPNI, warns that the desert is the last refuge for many raptors. Ensuring their survival may bring benefits to Israel, he said. Wildlife reserves and feeding stations for raptors and carnivores are expected to attract tourists and visitors from Israel and abroad. A survey showed that in the spring of 1977, over 754,000 migrant raptors passed the Negev region on their way from Africa to nesting sites in Europe.

Development of a different type of reserve, with its tourist potential, has gained momentum from the peace process. In Eilat, at the southern tip of the Negev, a newly developed coral reserve was recently inaugurated. It had been mostly ignored since the 1967 war when Israel developed coral beaches further south on the Sinai Peninsula. But with the realization that upon withdrawal Israel would be left with only 850 meters of coast in Eilat, NRA and the Government Tourist Association initiated restoration of the site.

Today, after two years of intensive development, stringent supervision and protection, coral is refilling the bald spots in the reefs while unique species of fish, absent for many years, are returning in significant numbers. Divers and snorkelers at the site, the northernmost coral reef in the world, will be guided along specially designed underwater paths by means of signs and arrows. Photographs and descriptions of flora and fauna unique to each site have been placed on signposts along the various underwater routes.

Paradoxically, the coral reserve whose development was precipitated by the peace process will be endangered by it as well. The return of the Gulf of Eilat coastline to Egypt is expected to increase ship traffic in the region with its attendant danger of oil spills. Adir Shapira of the NRA warns that while ways have been found to eliminate man's damaging impact on the reef, "the second destructive force remains: the location of the reserve near the ports of Eilat and Aqaba, near oil and fertilizer terminals, sewage plants and other industrial installations." While Israeli supervision over oil spills from tankers and ships entering Eilat has been greatly strengthened in past years, extra vigilance will be needed to ensure the continued existence of the coral reef once ship traffic to the region increases.

Finally, the desire of both environmentalists and the general public to preserve the unique natural attributes of the desert brought about the declaration of five nature reserves spanning a total area of 320,000 hectares in the Negev. But again defense needs clashed with the people's desire for a last refuge from civilization and a compromise had to be reached: Visitors will be allowed into some of the reserves only on national holidays; at other times the land will be utilized by the IDF as firing grounds. A similar agreement to enable Israel's nature lovers to continue special walking tours in areas designated for training grounds is now being negotiated between the IDF and the SPNI.

SHOSHANA GABBAY

Illegal skin trade bared by new wildlife Interpol

GENEVA—A new international "cross-checking" system for trade in wildlife has uncovered a multi-million dollar traffic in rare hides—using forged documents—between West Germany and

Paraguay.

The forgeries were uncovered by the Secretariat of the Convention on International Trade in Endangered Species (CITES) which is administered on behalf of the UN Environment Program by the International Union for Conservation of Nature and Natural Resources (IUCN). Both Paraguay and West Germany are among the 62 members of the Convention.

IUCN charged that for the past three years a Frankfurt-based firm (which it did not name) had been using forged documents to import the skins of thousands of endangered animals. Their

worth: an estimated \$12 million.

An IUCN spokesman said that Paraguay's President, General Alfredo Stroessner, promised to take immediate action to stop the illegal trade.

Several of the endangered species listed on the forged permits are not native to Paraguay and therefore were probably smuggled

in from neighboring Brazil, Argentina or Bolivia.

Uncovering the forgeries is considered a major triumph for CITES and its new international "cross-checking" system introduced recently. When nine export permits presented by the Frankfurt trader were passed on by CITES to Paraguayan authorities, they could find no evidence of the permits ever having been issued. The forms, they discovered, were printed in West Germany, and the stamps and signatures were false.

CITES Secretary General Peter Sand said, "Trade permits for endangered wildlife have become so valuable that they are being forged like banknotes. To foil the counterfeiters in future we plan—as with banknotes—to print them on forgery-proof paper."

WILLIAM G. MAHONEY

\$600,000 in grants allocated to threatened African animals

GENEVA—Two international conservation organizations have announced plans to spend more than \$600,000 on wide-ranging programs to save threatened wildlife in East Africa and Madagascar.

The International Union for the Conservation of Nature and Natural Resources and the World Wildlife Fund announced that a new national park in Sudan, anti-poaching equipment for Tanzania, assistance for Uganda's beleaguered wildlife and help to African governments to wipe out the illegal wildlife trade are among the activities that will be financed.

A small grant to Madagscar is significant because it signals the beginning of a new drive by the two organizations to save the island nation's unique but in many cases highly endangered animal and plant species.

WILLIAM G. MAHONEY

Wildlife...

THE FIRST LARGE NATURAL PRESERVE in the Arab world has been established in Saudi Arabia at Asir National Park. Its 450,000 hectare area will shelter 340 species of birds including 32 types of birds of prey such as the giant African Lammergeier and Arabian bustard, both of which are threatened with extinction. Animals like the Arabian gazelle and the South Arabian leopard, found nowhere else in the world, will roam freely in this area where hunting is flatly forbidden by Prince Khalel Al-Faisal, Governor of Asir Province. Local inhabitants, said the governor, are cooperating since "the people here are not hunters, they're farmers."

SAN SECONDO, an island in the Venetian lagoon, has been taken over by the Turin-based international anti-hunting committee, which plans to turn it into an oasis for migrant and aquatic birds and a center for ecological seminars.

The committee will restore a convent dating back to 1034 for the seminars and will clean

garbage and debris from the island.

The island of San Secondo, formerly an ammunition storehouse, is the latest environmental effort by the anti-hunting association for promoting the study and protection of birds. Since 1975 the committee has created oases for birds and centers for studying their habitats on Palmarola Island and in the lagoon areas of northern Italy.

SOUTH AFRICAN COMMERCE has voted more than R500,000 (\$666,300) to wildlife conservation in the 1980-81 period.

The unusually large grant was made at a meeting in Johannesburg of the board of trustees of the Southern African Nature Foundation, a group representing about 150 business and industrial concerns. SANF represents World Wildlife Fund in South Africa.

The money has been allocated to:

- The purchase of a farm to enlarge the Karoo National Park.
- The continuing translocation of 4,000 animals to Pilanesberg Game Reserve in Bophuthatswana—the newest game park in southern Africa.
- Research in St. Croix off Port Elizabeth which is home to 50,000 jackass penguins, an endangered species.
- The study of the extraordinary elephant, giraffe and rhino which have evolved special faculties to enable them to live in the parched wastes of the Kaokoveld, Namibia.

In Africa...

THIRTEEN OF 18 LEAD-USING firms surveyed by a South African newspaper failed to meet industrial health standards accepted internationally in one or more major respects.

The companies surveyed included battery works, paint factories, smelters, plumbing works and wire annealers.

In at least five, workers' blood lead levels were above the levels where they would be withdrawn from service in the U.S., according to the companies' own figures.

Four plants failed to monitor blood lead levels at all, while three did not do so often enough to satisfy international experts. Three did not provide separate changing facilities for work and street clothes.

The ones which failed to meet overseas standards employed more than 1,750 workers. All told about 150,000 workers are employed in plants where lead is used in South Africa, according to an estimate supplied by the Erasmus Commission on Occupational Health; of them 14,500 work directly in contact with the metal.

A SOUTH AFRICAN government report on its fishing industry aims to promote conservation of its dwindling seafood resources.

The reports recommend that the state should determine total and individual quotas based on the following principles: sustainable utilization, stabilizing the industry, maintaining competition to prevent monopolies, protecting quota rights of individual fishing boat owners, better research. A new statutory body is recommended to control the industry. This body would control all aspects of quotas, closed seasons and areas, factory licenses, equipment to be used, marine reserves and limitations on catches.

SHARKS netted along the Natal coast of South Africa have revealed mercury counts three or four times higher "than a scientist would expect," according to a survey conducted by the Council for Scientific and Industrial Research (CSIR).

A CSIR spokesman said, however, that the mercury levels were still many times lower than the levels at which there was a likelihood of Minimata disease. There couldn't possibly be any risk to people consuming the shark meat, he added. The source of the mercury build-up was not known.

Conservation organizations in Durban have called on the South African government to investigate the mercury content of shellfish and large edible fish and for a ban on building pipelines to discharge industrial wastes into the sea.

The state of South Africa's environment is in a state

JOHANNESBURG—The state of the South African environment leaves a lot to be desired, according to a report published by the Wildlife Society of Southern Africa.

The report says that although South Africa has 57 national parks and game reserves it has preserved only 3.4 percent of the land. If the country is to preserve viable examples of its major ecosystems a further 41 conservation areas should be proclaimed.

South Africa's conservation effort has been largely concerned with inland reserves, and little attention has been paid to inland water ecosystems. Many of these have been destroyed or drastically changed.

Fresh water is one of the country's basic needs but little has been done to protect headwater streams in the northeastern Cape and Upper Orange River catchment. The same can be said for the coastal areas. According to the report, most of the country's estuaries have been "severely degraded," and there is an urgent need to establish 44 estuarine reserves and 40 marine reserves. These are important for the fishing industry.

The status of South Africa's wildlife is little better than that of its habitats. The report says that 101 bird, 71 mammal, 28 freshwater fish, nine frog and 37 reptile species are on the endangered list.

Plants are equally threatened. Of the 17,500 species, 1,945 grace the IUCN endangered lists. Cape Fynbos, the world's sixth smallest but richest floral kingdom, faces the greatest destruction, the report stated.

MIKE NICOL

Zimbabwe has launched a tree planting program

SALISBURY—Five million of Zimbabwe's seven million tribespeople use wood for heating and cooking, and the country is losing trees at an alarming rate. Now the government of Robert Mugabe has embarked on a nationwide planting program.

Outlining the plan at an energy symposium here, the Minister of Natural Resources and Water Development Joseph Msipa said the destruction of indigenous forest and woodland has reached dangerous levels.

He described how the government will establish large-scale reforestation in the tribal areas, arrange top management to obtain maximum sustained yield, set up research into quick-growing exotic hardwoods and educate the people on intelligent use of wood fuel.

December 6 was set aside by Prime Minister Mugabe as National Tree Planting Day, and the entire population has been urged to plant at least one tree on that day—some three weeks after the annual rains are due.

"All this offers hope that we can produce forests of trees which will more than meet human demands," Msipa said. "Meanwhile, we are producing low-cost stoves using electricity or coal or sawdust as a substitute for wood. Pressures on woodland must be relieved, especially near towns where large areas have been denuded."

The OECD finds New Zealand's environment is in fine shape

WELLINGTON—The organization for Economic Cooperation and Development (OECD) says New Zealand is lucky, for it has the opportunity to anticipate environmental problems as it industrializes by using pollution-preventive technology.

The organization is making its third environmental report on a member country. With reviews of Sweden (1973) and Japan (1976) behind it, the Paris-based agency is preparing a report on New Zealand which a review team, representing 12 countries, visited in October after outprise preliminary inquire.

October after extensive preliminary inquiry.

The panel leader, Dr. James MacNeill, director of the OECD Environmental Directorate, told WER at the end of the tour that his team found that, compared with other OECD member countries, "comparatively speaking (New Zealand's environment) seems very good."

"We think—and I think this will be a theme of the report—that New Zealand has an opportunity here that most of the OECD countries that industrialized earlier did not have. That is, to anticipate these problems and to take preventive measures, particularly in the area of clean technology," MacNeill said.

"A lot of technology exists today that did not exist 10 years ago, for example in the pulp and paper industry, food processing, energy. We are now—you are now—in a position to build clean."

He said their work in the OECD indicaes that building clean is often much more economic. "And it's not only a matter of being environmentally efficient, but also being energy efficient, hence more economic."

One impression of the panel that was mentioned repeatedly was the frankness and candor with which all of the discussions were conducted. They had the impression that not only were the non-government organizations and the public meeting open and frank but also discussions with senior people in the government.

New Zealand hosts estimated that more than 1,000 people met the panel members as they moved around sample areas of a mainly pastoral and mountainous twin-island country which was covered in native forest at the time of European settlement 140 years ago.

The review was undertaken at the invitation of New Zealand, which is about to embark on an industrialization program aimed at supplementing energy supplies—supporting a second aluminum smelter with its hydro power and harvesting extensive second-generation pine forests.

The survey is expected to offer new guidelines for the effectiveness and independence of the environment commission and also for the government's ministry charged with care of the environment, which seem to have their roles made more difficult by legislative provision for fast-track processing of big construction projects.

The OECD environment committee will refer its report to the organization's council, possibly in early December. After that it's up to New Zealand.

JOHN KELLEHER

Down under ...

THERE MAY BE MINING in one of Australia's biggest national parks—if an application by the Universal Milling Company Proprietary Limited is approved.

The company has applied for permission to mine 5.6 hectares of the Fitzgerald River National Park's 242,729 hectares. But mining in an Australian national park has never been approved, and the National Parks Authority of Western Australia has opposed the application. The final say will come from the state Minister for Mines, on the recommendation of a park Wardens Court.

WESTERN AUSTRALIA'S Energy Commission has developed a portable solar/wind power plant for remote farms. The plant, measuring 5.5x3x3 meters and weighing 8 metric tons, consists of a battery bank and an inverter which converts the direct current from batteries into alternating current for standard domestic use in Australia. The power input comes from an array of 60 photovoltaic solar cells on an adjustable roof mount and a 5 kilowatt windmill. The plant, which costs \$104,535, can supply enough power for the needs of a small family when both the solar cells and windmill are operating. Without the windmill, it supplies all except cooking needs.

In another development, the University of Western Australia's Department of Mechanical Engineering is studying the use of a sunlight concentrating system which would reduce the number of solar cells required in solar power generating units. At present, solar cells cost about \$17.40 per peak watt, but a concentrating device can reduce this by 80 percent, the researchers said.

ETHANOL FROM BEETS for fuel could be commercially viable in northern Tasmania, Australia's island state.

A report by the British firm, Atkins Planning, for the island, where 30 percent of all energy is hydroelectric, found that a method using coal as a process fuel with conventional technology would result in production of ethanol at a cost of 37.7 cents a liter. The report suggested a 15 percent blend would replace supergrade petrol in Tasmania.

The study found it would be possible to produce 37 million liters of ethanol a year from one factory and suggested beets be farmed on a scale to supply two such plants.

In Latin America ...

WITHIN SIX MONTHS, a Brazilian steel company hopes to be replacing up to 15 percent of its petroleum derived fuels with domestic and industrial garbage. The garbage will be collected from the Lower Santos region and stored in a sanitary earthworks for which a pilot blueprint already exists.

The steel mill, Cosipa, based in the state of Sao Paulo, is responding to a challenge issued by the Works and Environment Department to get the project off the ground within 180 days. According to Cosipa, garbage will be feeding the forges and blast furnaces of the steel mill on schedule providing all of the parties involved reach rapid agreement.

CARS MAY BE BANNED from Brazil's city streets one day a week under a plan now being considered, the Ministry of Transport announced.

The purpose of the ban would be to test the capacity of the country's urban mass transport systems and to force people to use them—many never have. Ministry officials say that such a ban is the only way that weaknesses in the systems can be spotted and that it will prepare the country for possible future oil emergencies.

A pilot test may take place in the city of Curitiba.

BRAZILIAN SCIENTIST Jose Goldemberg, thinks Brazil should introduce a ProSolar program along the lines of the successful ProAlcohol (gasohol) program. This, he says, would be the natural next step as the technology had been well established in the country on a commercial scale.

The use of solar power has been growing rapidly in Brazil even without government support for domestic and industrial use. With some form of government incentive, says Goldemberg, up to 10 percent of the fuel oil used by industry to heat water could be replaced by solar power. This water, he says, does not have to exceed 100°C, which is well within solar capabilities.

THE GRENADA GOVERNMENT is to carry out a survey of energy being used by the tourist industry of this small island 150 kilometers from the Venezuelan coast. The survey results may be used to investigate the appropriateness of alternative energy sources.

VENEZUELA'S ENVIRONMENT MINISTRY and the National Agricultural Training Institute, INAGRO, will launch an educational program among 17,000 rural families to improve living standards as well as to instruct farmers in the conservation of natural resources.

In Chile ecology takes a back seat to economic development

SANTIAGO—The Chilean military government's commitment to environmental protection seems to have more form than function.

"Ecology just doesn't go along with this government's conception of economic development," said a government official who is an environmental expert.

Superficially, a good deal of environmental officialdom appears to exist. Although there is no environment ministry as such, there are 30 government offices that have an environmental mandate of some sort, as do five private non-governmental institutions, and all within the Santiago metropolitan region alone.

Dr. Juan Grau, founder and president of the private Ecological Institute of Chile, recently changed hats and is now working as environmental advisor to the Ministry of National Goods and Services. He has praise for certain "isolated efforts" by the government but says that generally there is no coordination and no serious overall effort.

He recommends that Chile have a general law of the environment, a ministry of environment, a governmental body that will make sure the laws are complied with and, in particular, greater understanding on the part of Chilean economists that they are dealing with limited resources.

Chile's major environmental problems, he says, are: "The water system, just like the rest of Latin America, then the overuse of resources, deforestation, Santiago's pollution."

The environment of this Latin capital is highly contaminated, as the recent winter (June-September) showed. This year saw higher particulate and carbon monoxide levels than in many previous years. Recent legal limits on auto emissions in the Santiago basin and limits on the size of imported internal combustion engines so far have made little dent in the Santiago smog belt.

Industrial contamination, both in urban centers and in remote areas where the large copper smelters are located, goes totally uncontrolled. In farming areas there are no controls on the use of pesticides or other toxics, and the use of human waste to fertilize crops has caused all of Chile's water supply to be a breeding ground for typhoid and other diseases.

The ocean, in a nation with nearly 5,000 kilometers of shoreline, is polluted near industrial and urban areas. Seals, whales and other forms of wildlife are freely hunted, though controls on catching some forms of shellfish have been applied, apparently for economic reasons.

JOHN ENDERS

Air quality congress draws 400 experts to Argentina

BUENOS AIRES—Over 400 environmentalists from 33 countries met here in October at the Fifth International Clean Air Congress sponsored by the International Union of Air Pollution Prevention Associations (IUAPPA).

Conference themes varied from indoor air quality and energy

conservation to the health effects of alcohol fueled cars and air pollution legislation to global issues such as acid rain and ozone depletion. Reports were also given on air pollution measures now being taken in different countries.

Dr. Mostafa Kamal Tolba, executive director of the UN Environment Program (UNEP), noted that it was the first time a clean air congress had been organized in a developing country.

This year's congress, organized by the Argentine Association Against Air Pollution, was especially well attended by delegates from Latin America. This was in keeping with IUAPPA's goal of passing on air pollution prevention information to developing countries so they can avoid making the errors of the more industrialized nations.

The next International Clean Air Congress will be held in Paris in 1983.

BARBARA SCHAFFER

The East Asian Seas Action Plan draft due in December

BANGKOK—In December environmental experts from Indonesia, Malaysia, the Philippines, Singapore and Thailand meet here to put final touches to the draft East Asian Seas Action Plan.

The plan was given its first review at a United Nations Environment Program (UNEP)-sponsored meeting in Baguio, the Philippines, June 17-21. Aimed at countering the growing threat of pollution to the lengthy coastlines of these five countries, the plan will provide a comprehensive and environmentally sound basis for protecting and developing their coastal areas.

During the second meeting, to be held here December 8-12 at the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) complex, technical arrangements will be agreed on, clearing the way for an intergovernmental meeting next April which will formally adopt the plan. Singapore has been suggested as the venue.

Since April 1976, some 20 related meetings and studies have laid the basis for drafting the Action Plan. The overall aim is to find out what is happening to the regional marine environment, its organisms and delicate eco-systems, and endangered species through the effects of oil and waste disposal pollution, destruction of coral reefs and mangrove swamps and siltation.

This information will be used in coordinated national, subregional and regional research programs, and pollution monitoring and management of marine and coastal development activities that will have an impact on environmental quality and renewable marine resources.

The plan will also initiate training programs for scientists and technicians, provide support for marine laboratories, while also developing legal instruments to protect the coastal areas covered by the treaty.

The ultimate aim is to make the proposed regional programs self-supporting. Initially, financial support will probably be provided by the United Nations system, but eventually the Action Plan program will be financed by voluntary contributions from governments, international and non-governmental organizations and other sources, both inside and outside the region.

In Asia..

SOUTH KOREA is planning to form an interministerial body to examine the impact of industrial development projects on the nation's environment, said sources at the Office of Environment. This new Environment Preservation Committee will be headed by the Prime Minister. Other members will include the Ministers of Commerce-Industry, Agriculture-Fisheries, Home Affairs, Construction and Energy Sources and the heads of other related government agencies. The Committee is expected to be formed by the end of this year.

THE JAPANESE GOVERNMENT has decided to extend by five years the present 10-year anti-pollution program, which is due to expire at the end of fiscal 1980, because the original goals of the program have not been achieved.

In line with the government decision, the Environment Agency has proposed to extend for 10 years the law concerning financial measures against pollution so that the central government will continue to provide subsidies for such projects. The law was to expire at the end of fiscal 1980.

THE CONSTRUCTION PLAN of a \$950 million (\$\$2 billion) petrochemical complex, to be built in Singapore, was recently rejected by the Singapore government for failing to meet specified anti-pollution requirements. According to informed sources, one requirement which the plan has not met is the construction of an enclosed ground-level flare system to burn off unwanted hydrocarbons when the complex is in operation. Sumitomo Chemicals of Japan, planner of the complex, suggested using an elevated flare system. Another controversial issue is the government's insistence that the complex should not use fuel for burning with a sulphur content of more than 2 percent.

THE THAI MINING ASSOCIATION recently complained that the National Environment Committee (NEC) has been causing costly delays in offshore tin mining operations around Phuket. Some 15 companies which had been granted concessions by the Mineral Resources Department to survey and mine in the area have been waiting for up to two years for NEC approval to proceed, said a mining association spokesman. Some mining firms had invested millions of baht for prospecting and some had already bought dredges, he said. The NEC has delayed approval because of fears of ecological damage from large-scale offshore mining on the popular tourist island.

Briefly ...

WASHINGTON'S DIPLOMATIC CORPS attended a unique three-day conference on "Environment: The Global Connection," held in the U.S. capital at Meridian House recently. The highly successful meeting was sponsored by the U.S. Environmental Protection Agency, World Wildlife Fund, U.S. Department of State, UN Environment Program, World Bank and the U.S. Council on Environmental Quality. Top international specialists discussed land use, water systems, environmentally sound economic development and where to find international environmental information (our Center' executive director, Whitman Bassow, was a speaker).

THE ISRAEL ECOLOGICAL SOCIETY has issued a call for papers for its 12th annual scientific conference to be held at the Hebrew University in Jerusalem on May 13-14, 1981. A leading expert in the field of environmental sciences from Egypt has been invited to give the keynote address.

The conference program will include environmental protection, water and air pollution control, environmental health and toxicology, resource recycling and solid waste management, environmental aspects of energy and urban development, legal and economic aspects of the environment, arid zone and desert ecology, and ecology of rivers, lakes, reservoirs, and the sea.

The deadline for submitting papers or poster presentations in English, not exceeding five pages, is December 31, 1980. For further information contact Prof. H. Shuval, chairman, Israel Ecological Society, Hebrew University-Hadassah Medical School, Environmental Health Laboratory, P.O. Box 1171, Jerusalem, Israel.

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The Center is a non-profit, non-advocacy, educational organization which seeks to foster public understanding of global environmental issues. Established in 1974 by the UN Association of the USA with the support of the UN Environment Program (UNEP), it was formerly known as the Center for International Environment Information. The Center alone is responsible for WER's contents.

Swedish scofflaws will be hit with tougher eco-penalties

STOCKHOLM—Specially trained environment police and prosecutors are needed in order to come to grips with violations of Swedish environmental laws.

This step was urged recently by Thomas Rahmn, director of environment protection in the province of Vaenersborg, against a background of increasing disregard for laws and regulations designed to safeguard the environment.

Meanwhile, the National Environment Protection Agency (NEPA) announced it was taking sterner action to achieve improvement and more respect for the law. But environmental workers in the field expressed their doubts that such a campaign would be effective.

NEPA's alarm grew out of its investigation which showed close to 100 communities and industrial enterprises continually violated or were suspected of violating laws intended to protect the environment.

"A number of cases are flagrant violations, for example, discharge (of pollutants) which exceeds prescribed limits by six times," said NEPA's chief Valfrid Paulsson.

Court of Appeals Assessor Ulf Bjaellaas, who conducted the NEPA investigation, declared there were various reasons for the violations but "above all, it almost always means an economic profit for those who break the law. Scrubbers, dampening of noise and the like cost money." Other causes he cited were ignorance of the law and technical difficulties in measuring pollution and then analyzing the results.

A new law, sharpening penalties and extending the time for prosecuting offenses from the present two to possibly five years is in the works.

NEPA has long advocated application of the principle that "those who damage the environment should also bear the costs that society must meet to reduce the pollution" by paying a fee for each day that the offense continues.

A survey by the national morning newspaper Svenska Dagbladet disclosed that on the whole environmental protection units among the provincial governments take a skeptical view of prosecution efforts. It summarized the attitude as follows:

"Notice of violations very seldom leads to prosecution. And the infrequent prosecutions in turn hardly ever lead to convictions. It is doubtful if even the planned sharpening of the environment protection laws is sufficient to get at environmental violations since the police and the public prosecutor seldom have the time or the knowledge to investigate environmental offenses."

One difficulty cited is that the present law is regarded as too weak. It isn't enough to show that a firm violated environmental regulations, but it also must have had harmful intentions and demonstrably damaged the environment.

SPECIAL TO WER



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Controversial U.S. asbestos firm pulls out of Ireland

DUBLIN—Raybestos Manhattan, the American asbestos company embroiled in the biggest industrial/environmental controversy ever seen in Ireland, has decided to pull out of the country.

At a press conference in Cork, the firm's international president, Gabriel Ferucci, said the decision was due primarily to recession in the American automotive market but admitted that the company had lost European markets by the long delays in getting the plant into production.

These were caused by protests staged by residents near the factory at Ovens in County Cork. This forced the first dump site to be changed and moved to Ringaskiddy, where other residents fought it through court cases, jail threats and even a riot at the site when Raybestos forced their way in to dump asbestos waste.

It was the use of asbestos to make disc brake pads which caused the trouble. Raybestos claimed at the news conference that monitoring showed the factory to have been possibly the cleanest in Ireland and not to have caused pollution.

Local residents said they were delighted the company was pulling out but regretted the loss of 130 jobs. The Irish Industrial Development Authority, which had encouraged Raybestos to set up in Ireland, will now buy the factory building from the company and try to find another industry for it.

Meanwhile, the need for a toxic waste dump is still acute in Ireland. Proposals for one at Nohoval in County Cork have been fought to a standstill by local farmers, but in County Dublin the local government authorities have now agreed to site one at Dunsink, near Finglas, where there is already a waste dump for non-toxic materials.

Dublin County Council was told that 370 firms needed such a dump and between 25 and 50 had major immediate problems in dumping waste.

It is generally agreed that the lack of a toxic waste dump is a major drawback to Irish industrialists, but so far attempts to establish such sites have been strongly fought by environments.

The decision to site a dump in County Dublin parallels similar decisions made in County Cork which were subsequently fought by environmentalists.

TOM MacSWEENEY

Toxics...

STRICT NEW PROPOSALS by the European Commission aim to eliminate the national disparities that now characterize asbestos control and the degree to which workers are exposed.

The proposals, drawn up recently, call for phasing out the use of asbestos in the building, construction and engineering industries. They also seek more rigid medical surveillance of workers who are using asbestos.

JAPAN'S ENVIRONMENT AGENCY will survey the extent of asbestos pollution nationwide and study control measures in a three-year plan which will begin during fiscal 1981.

Restrictions in 1971 and a memorandum in 1976 limited the asbestos dust level to less than five asbestos fibers per cubic centimeter, but there have been no restrictions on the release of asbestos dust into the air outside the factories or on the use of asbestos, the Asahi Evenings News reported.

During fiscal 1981 and 1982, the Environment Agency plans to study the current use of asbestos and the level of dust in the environment. In fiscal 1983, the data collected will be used to study measures to restrict pollution and use

THE PHILIPPINE FERTILIZER AND PESTICIDE Authority (FPA) has decided to restrict the use of 24 types of pesticides in the country. They may only be used for emergencies with the approval of FPA authorities. The 24 pesticides include: DDT, mercuric fungicides, Parathion, 2,4,5-T, Leptophos, Aldrin, chlordane, Dieldrin 15EC and 15WP, Heptachlor 2E and 3, DBCP, Aldicarb, HCH or BCH, carbofuran, Endosulfan, Methamidophos, dichlorovos, mephosfolon and methyl parathion-based formation.

WHILE PESTICIDE MANUFACTURE in South Africa is strictly controlled, negligent usage has resulted in serious illness and even death, said the Department of Health.

Procedures and suggestions for use are required by law to be on the pesticide label, but there is no official monitoring to ensure that they are obeyed.

No one is sure how many cases of pesticide poisoning occur annually on South African farms. "It is a tragedy that their negligent use time and again results in serious illness and even death," reports the Department of Health. In one incident on a Cape farm earlier this year, 13 workers were poisoned.

Last year the Department of Health heard of 100 fatal cases and 72 non-fatal ones. All pesticide poisoning cases are supposed to be reported to it, but cases treated by private doctors frequently are not.

40,000 South African asbestos workers risk fatal illnesses

JOHANNESBURG—More than 40,000 South African workers who mine, produce or handle asbestos run the risk of serious or even fatal illness, say medical authorities here.

In addition, many of the tens of thousands of retired asbestos workers have damaged lungs and other serious ailments through working in the even more dangerous conditions which prevailed in the past.

The workers currently at risk include 21,000 asbestos miners, 4,000 involved in the manufacture of asbestos cement and at least 15,000 in other trades where asbestos products are made or used, according to an estimate by Dr. Jonathan Myers of the SA Labor and Development Research Unit.

About 100 cases of asbestos-related cancer are now reported annually in South Africa, but medical research suggests that 20 to 50 percent of people with asbestosis, which causes lung scarring, will also get lung cancer, according to Dr. Myers.

Equally worrying is the fact that most living cases of asbestosis reported are white while most of the industry's workers are black. Dr. Ian Webster, director of the National Center for Occupational Health, says the same holds true for cancers of the lung lining. He indicated that these figures suggest there may be many retired black workers whose illnesses have not been diagnosed.

MIKE NICOL

Eco-politics in Thailand may stop a major soda ash project

BANGKOK—Several months of environmental protests and bickering have caused so much controversy over a proposed soda ash industry in Thailand that the project may be abandoned. It is sponsored by the Association of Southeast Asian Nations (ASEAN).

The project, to be sited at Laem Chabang near the beach resort of Pattaya on the Gulf of Thailand, has been the subject of protests and public rallies over the possible danger of high pollution levels in the Gulf.

On October 30, the Deputy Prime Minister Boonchu Rajasastien was quoted by English-language newspapers here as saying, "the project is all over." Meanwhile, Industry Minister Major-General Chatichai Choonhaven said, "as far as I know, it has not been dropped," and that he had not been informed by Mr. Boonchu of any such impending move. He added that there had been so much dissension over the project that it had become a political issue, thus causing even greater confusion.

Deputy Prime Minister Dr. Thanat Khoman said that the final decision could be made only by Prime Minister General Prem Tinsulanonda, but an immediate decision was thought to be unlikely

A major problem in choosing a new site would be the need to totally reassess the investment costs, which could mean a big

increase in the total cost. At the same time, a change in location would have to be agreed on by the other four ASEAN members—Indonesia, Malaysia, the Philippines and Singapore.

Pollution is already a problem near the proposed site, according to some official sources, due to the heavy commercialization of Pattaya and the operation of two oil refineries further north along the coast, at Chon Buri. The possibility of even greater pollution in this part of the Gulf from the soda ash project has caused great concern among local fishermen and coastal residents, together with local hoteliers and businessmen.

If the venture is discarded, an alternative proposal will be needed if Thailand is to take part in the ASEAN scheme for economic cooperation. One such possibility is a potash plant, which would also benefit the country, according to a Finance Ministry source. He said some consideration had already been given to developing such a project.

TONY OLIVER

Bangkok is recycling plastic bags for cash and clean-up

BANGKOK—Plastic bags turn up just about everywhere in this capital city. Even the dwindling number of canals have more than their fair share of this almost indestructible product. Yet recently there has been a change in attitude to the thousands of bags discarded daily in the city's streets.

Plastic bag hunters, including hordes of children, spread out daily through Bangkok, although many concentrate on the city's garbage dumps, to search out these "nuggets" of unwanted rubbish. Their collections are then sold to roving agents who, in turn, sell the bags to recycling factories to be made into plastic pellets. These pellets are later recycled again into components for the production of other plastic goods.

At Bangkok's garbage dumps alone, some six tons of bags are gathered each day, and agents pick up about 500 kilograms of bags daily. Today, the bag boom has pushed prices up to more than a third of what it was 18 months ago. However, for the collectors the picture is not so bright, since many more Thais—particularly the slum dwellers—are out hunting these days. Some lucky hunters manage to collect 20-30 kilograms, but for the majority 10 is considered a good daily haul. Most do not have the time to roam far out into the suburbs; families have to be cared for and fed,

The price of imported fresh pellets is about 30,000 baht (\$1,500) per ton, whereas the local price is 15,000 baht (\$750), per ton of recycled pellets. This ensures an almost monopolistic market for the local recycled variety, and although there are certain products which are supposed to be made from new rather than recycled plastic, the rules are sometimes broken. A walk around any of the city's slum areas, any day of the week, emphasizes this, with lines of used plastic bags laid out after washing on the corrugated tin roofs of many of the humble dwellings. It may not be very pleasant rummaging through piles of garbage, but for more than a few it is a major source of income. And it is helping to keep Bangkok from smothering in plastic bags.

TONY OLIVER

Recycling ...

THE KOREAN RESOURCES RECOVERY and Reutilization Corp., set up under a Presidential Ordinance, was recently inaugurated. The corporation will collect solid wastes from factories manufacturing synthetic resin products and recycle them for industrial use—about 100,000 tons of wastes a year. Funds for its establishment and operation will be paid half by the government and half by industries producing or importing synthetic resin. The corporation has eight provincial offices, 45 waste collecting centers and 16 incinerators throughout South Korea. The facilities are designed to be non-polluting.

THE CITY OF KYOTO, Japan's ancient scenic capital, is considering a regulation requiring beverage manufacturers to collect empty cans, the first such legal ordinance of its kind in Japan.

Japanese newspapers report that a draft regulation has been presented to the mayor of Kyoto and that passage is expected in the spring. The Asahi Evening News said that the draft regulation calls for makers to pay a fine if they fail to collect the used cans. Customers would pay a deposit fee, such as for bottled drinks, which would be redeemed when the empties are returned to the retailer.

A Tokyo suburb, Machida, put a similar rule into effect in 1973, but it has no binding force.

FACED WITH RISING ENERGY costs, the use of heat from garbage disposal plants to generate electricity has become popular in Japan. As of mid-1980, 28 garbage disposal facilities had generating plants with a total capacity of 79,000 kilowatts. An additional eight garbage powergenerating plants capable of producing 25,000 kilowatts will be operational by March, 1981. Some plants have a surplus which they sell to utility companies. For example, the Katsushika plant of Tokyo, with a power generating capacity of 12,000 kilowatts, earns about 250 million yen (\$1.14 million) by selling 65 percent of its output to Tokyo Electric Power Co. Some plants supply heat and electricity to nearby swimming pools or welfare facilities. The Health and Welfare Ministry subsidizes a quarter of the construction cost for a garbage-power system.

THE SWEDISH PAPER AND PULP Association announced that Sweden's paper and board mills recycled 634,000 tons of waste paper and board in 1979, a 15 percent increase over the previous year. Use of waste paper has been on the rise throughout the last decade and by 1979 accounted for 10 percent of the paper industry's fiber consumption.

Waterwise...

IN INDIA, the Works and Housing Ministry has drawn up a \$14 million plan for the International Drinking Water Supply and Sanitation Decade, 1981-1990.

Under the plan, 80 percent of rural and urban areas will have sewage systems or sanitary toilets connected to safe disposal systems (about 25 percent of the population in rural areas will get sanitary toilets).

India is being assisted in this effort by the World Health Organization.

THAI BEER DRINKERS feared a drought of draught when the government ordered the country's major brewer to shut down because it was dumping 3000 cubic meters of untreated waste a day into the Chao Phya River.

But two days later a 45-day reprieve was granted after the company, Boonrawd Brewery Co. Ltd., was able, after weeks of delays, to put its 6000 cubic meter water treatment plant into operation. Visit Noiphan, Deputy Director General of the Industrial Works Department, said the brewery would continue operating as long as the treatment plant performed satisfactorily but that a close watch would be kept during the 45 days.

THAILAND AND BURMA are currently planning a joint water development project on the Salween River, along their mutual border.

Deputy Agriculture Minister Dr. Anat Arbhabhirama said that, when completed, the electricity generated from Bhumipol dam would be boosted by 6000 megawatts annually. The project would also expand Burma's irrigated farmland by 2.4 million hectares.

In another major project, Thailand plans to tap the Moon River in the northern part of the country. A feasibility study for this project has been completed, and the Netherlands has promised to provide a Baht 41 million (\$2,050,000) grant to carry it out.

JAPAN was to become a party to the London Convention on Prevention of Ocean Pollution Caused by Dumped Waste, effective November 14, 1980.

THE SOUTH KOREAN Office of Environment will conduct a two-year environmental survey of the nation's four large rivers—the Han, Naktong, Kum and Yongsan—beginning next year. Data from the survey will be used to draw up a 10-year master plan for their environmental preservation. Its estimated cost will be 10,000 million won (\$16.25 million), and of that total, \$6.5 million will be financed by domestic funds and the balance split between the Asian Development Bank and the World Bank. A steering committee composed of government officials from various ministries will be formed to take charge of the 10-year program.

South Africa will make food from industrial waste water

JOHANNESBURG—A massive plant that will turn industrial waste into food is to be built at the AECI (African Explosives and Chemical Industries) complex at Modderfontein, South Africa.

Officials at AECI have been researching the project—which is like science fiction come true—in secret for almost three years. If their demonstration plant is successful, they should produce about 40 tons of edible dried algae a day.

The scheme is unique in that it will be the first to use only industrial effluent. Its primary purpose is to remove nitrogen from AECI's waste water, but the high protein and vitamin food it will produce from its 20 hectares of canals will help pay for the cost of treatment.

The dried algae can be eaten by people; it looks a bit like bluegreen sage and tastes something like spinach. It is ideal for feeding most meat-producing animals.

Mrs. Jopie Bosman, the biologist who heads the research team, says the principle is that nitrogenous waste is fed into a continuous "race track" canal into which algae of the genus Ankistrodesmus are introduced. A pump keeps the water turbulent to allow the algae to be exposed to sunlight, which stimulates growth.

Apart from nitrogen being a natural food for green plants they also need carbon dioxide. Modderfontein produces the gas in huge quantities and is able to bubble it into the canals. This also keeps the pH level constant—an essential for optimum growth.

At the end of the canal the algae are extracted and then dried. The extraction plant for the demonstration plant is big enough to fill a large hall. The eventual plant for the full-scale scheme will be a huge complex costing millions.

MIKE NICOL

Mexico's Pemex oil company signs an environmental accord

MEXICO CITY—In an historic agreement, Mexico's state-owned oil industry, Petroleos Mexicanos, has said it will comply with rules laid down by the Environmental Improvement Sub-secretariat of the federal Secretariat of Health and Public Assistance. Witnessing the signing of the agreement was Mexican President Jose Lopez Portillo, his presence adding to the importance of the act.

Included in provisions of the accord is the transformation of industries in the heavily-populated central Valley of Mexico from other combustibles to natural gas. A natural gas pipeline will be laid to the capital, in the center of the Valley, from fields in the southern state of Chiapas. This can reduce atmospheric contamination by as much as 30 percent, said Dr. Mario Calles Lopez Negrete, health secretary, who signed the agreement with Jorge Diaz Serrano, Pemex director.

In areas of heavy Pemex activity, treatment plants will be constructed to remove toxics from discharged water before it is pumped into the nation's rivers, another provision stated. Agricultural activities will be reinitiated in areas of petroleum activity,

said another part of the agreement, with the help of Pemex.

In signing the accord, Dr. Calles Lopez Negrete said future similar agreements are planned between the health secretariat and the Federal Electricity Commission, federal steel industry, federal fertilizer industry and the nation's sugar industry.

KATHERINE HATCH

Latin America will soon produce its own electric cars



RIO DE JANEIRO—With \$6 million of his own, Brazilian engineer Joao Augusto do Amaral Gurgel has built the first electric car factory in Latin America, at Rio Claro in the state of Sao Paulo. Next January, his rechargeable roadsters will go on the market.

Gurgel had produced a prototype in 1973 and got zero response from the government—so he went it alone. Meanwhile, the government was forced into developing alternative energy sources because its fuel bills were soaring. Brazil's oil bill today is nearly 50 percent of its total foreign earnings. The nation is still 80 percent dependent on imports for its domestic energy needs, although it has embarked on a massive alcohol fuel program.

Brazil is trying to increase its hydroelectric generating capacity, now 28 million kilowatts, to the estimated potential of 213 million kilowatts. More hydroelectricity could power more and more electric vehicles.

The launching of the Gurgel electric car coincides with the dawning of an ecological consciousness in Brazil. Pollution used to be regarded as a sign of economic growth. But with public outcries over devastation of the Amazon, the massive pollution of rivers and ocean, and car emissions smothering Sao Paulo and Rio in a sulphurous smog, the government is finally introducing tighter controls.

Gurgel believes that "use of the electric vehicle is irreversible ...our cities need non-polluting quiet vehicles." Studies found, he said, that 80 percent of urban vehicles travel less than 70 kilometers a day at a speed not exceeding 60 kilometers an hour. He claims his car can do 80 kph in heavy traffic and 100 kph at constant speed and that it has a range of 125 kilometers. The car's batteries are recharged overnight using a domestic circuit. He is now working on a hybrid vehicle which runs on electricity and alcohol, suitable for both city and long-distance driving.

His Itaipu car (named after Brazil's and the world's biggest hydroelectric project) will cost about \$8,600, but running costs should be low, about 80 cents a kilometer, well below the cost of gas in Brazil.

However, Gurgel already has competition. A big consortium (Bardella, Lucas, Puma and Invel groups with the state of Parana electric company Copel) plans to produce the Electro electric car with a range of 100 kilometers and a speed limit of 80 kilometers an hour. They have government approval and their prototype should be ready in late 1981.

GEORGE HAWRYLYSHYN

Transportation ...

A JAPANESE DISTRICT COURT has ruled in favor of Japan's high-speed "bullet train," saying the Shinkansen's contribution to the public interest outweighs the environmental disruption.

More than 400 residents of the central city of Nagoya had filed suit in 1972 alleging that the 200-kilometer-per-hour Shinkansen had caused them mental and physical suffering. They demanded that the Japan National Railways, named in the suit, reduce the speed of the train to 70 kph in a heavily populated 7-kilometer stretch of the city. The court refused to grant a direct relation between the nervous disorders and the train, but ordered the JNR to pay up to 4.3 million yen (about \$6,000) to each plaintiff in consolation money.

The Shinkansen, which has carried 1.5 billion passengers since it opened in 1964, links Tokyo with Fukuoka, 1,176 kilometers to the west.

THE JAPANESE GOVERNMENT has decided to cut the amounts of nitrogen oxide (NOx) which small and medium trucks may emit and the permissible noise levels for passenger cars by 1982, the Environment Agency announced recently.

Medium-sized trucks and vans weighing over 2.5 tons must keep NOx emissions at an average of 750 parts per million (ppm), a 32 percent decrease, as of January 1, 1982.

Small trucks (under 2.5 tons) will be required to cut emissions by 25 percent, and 2,000 to 3,000 cc-class vehicles with diesel engines must reduce emissions from an average of 340 ppm to 250 ppm, a 15 percent decrease.

Passenger cars must cut their noise levels from 81 to 78 phons from October, 1982.

These restrictions will be applied to old and new imported vehicles from April 1, 1984.

AUSTRALIA IS LEADING the way into environmentally-conscious transport for the future.

Australia was the first country to order updated coal-fired ships; the old coal burners went out of fashion during the cheap-oil decades of the 1950s and 1960s. Thomas Nationwide Transport's associated company Bulkships has ordered two 75,000 dwt bulk carriers from the Italian Monfalcone shipyards, and ANL has ordered two similar ships from Mitsubishi Heavy Industries. All four vessels are to be chartered to a giant bauxite mining venture in Queensland.

South Australia, a pioneering state in the electric car field, has ordered 10 vans from General Motors-Holden which will be outfitted with electric power packs from the state's Flinders University. Five of the vehicles will be evaluated by private companies while the government studies the other five. Each van costs A\$12,000 (US\$13,920) or about the equivalent of a luxury domestic conventional car.

Air quality...

THE SPANISH GOVERNMENT is planning to tighten controls on atmospheric pollution in an attempt to avoid a repetition of last winter when some experts claim as many as 700 city-dwellers died of pollution-related causes.

A study prepared by the Inter-Ministerial Committee for the Environment recommends reducing legal levels of atmospheric pollution, currently the highest in Europe, by 50 percent. Existing legislation permits 300 micrograms of heavy particles and 400 micrograms of sulphur dioxide. Under a draft amendment expected to be approved by the cabinet in the next weeks, these levels will be brought down to 150 and 250 micrograms respectively. The levels which force a declaration of state of emergency will be cut by the same proportion from 600 and 800 micrograms.

An administration official said, "These could be reduced by changing the fuels we use and adjusting our heating—things we should have done already."

AN AGREEMENT BETWEEN the Korea Cement Co. and residents of Changsong has put an end to a long drawn-out struggle waged by the residents since the cement plant started operating about eight years ago. They agreed to have the Environmental Research Institute at Yonsai University of South Korea undertake a comprehensive survey to assess the damage the company's plant caused the town of Changsong. The company is prepared to pay the amount of compensation determined by the institute. It has already deposited 30 million won (\$50,300) with the county office to finance the survey. The cement company will also fit its chimneys with dust collecting devices by February next year. It also has promised to pay for the relocation of houses from around the large cement plant.

TO PROTECT INDIA'S TAJ MAHAL, two thermal power stations in Agra will be shut down by the end of the year.

The closures have been recommended by a select committee of the Department of Science and Technology. Dr. M.G.K. Menon, secretary to the Department, said ash emissions from the plants were particularly harmful to the famous monument but that smoke from nearby locomotives and iron foundries also contributed to the problem. He said they were recommending less-polluting fuels.

The Uttar Pradesh State Electricity Board has accepted the recommendations.



Swiss drivers are angry about strict emission plans

GENEVA—In Switzerland, an argument is raging over a plan to impose stringent U.S. standards governing car exhaust emissions instead of the European Commission standards, which are more lenient—and which are used throughout the continent.

The government's executive arm, the Swiss Federal Council, announced its decision on July 11, 1979, to take effect as of September 30, 1982. It immediately led to a free-wheeling debate between environmentalists and all elements of the automotive industry plus economists, European integrationists and the cardriving public and their automobile clubs.

The auto industry noted that Sweden had made a similar move earlier but since had discovered that it involved many negative impacts and is now reconsidering its decision.

No one argues the fact that environmental protection must be provided—and at a cost, industry lobbyists say. However, if Switzerland adopts standards projected for 1986 in the U.S., it will mean that catalyzer techniques will have to be used and, the lobbyists say, at present no catalyzer exists that is able to function for even half the necessary longevity if it uses Europe's leaded gas. This would mean, the auto industry says, that the catalyzers would have to be changed frequently resulting in high added costs and a waste of prime materials.

Unleaded gas is not in Europe's near future, they argue. If tiny Switzerland existed as an unleaded gas island in the center of Europe, every time a citizen drove his car over the borders, he would damage his catalyzer because there would be no unleaded gas available. The other side of the coin; what of the 50 million foreign cars that enter Switzerland annually that will need leaded gasoline? They predict also that European car manufacturers will simply pull out of the relatively small Swiss market.

Some economists see a larger problem—the balance of payments. More stringent exhaust controls would translate into higher gasoline costs, and cars with catalyzers would also be higher priced.

Environmentalists point out that the U.S. offers both types of gasoline and that Switzerland could do the same. They also say it is up to the auto industry to provide the technology necessary.

But there is no easy answer for Swiss drivers, millions of whom live minutes away from the Italian, French, Austrian and German borders. They move across them as easily as a New Yorker wheels into Connecticut—but in this case they would not be able to use the gasoline.

The final decision in this direct-democracy country will probably come from the people in a nationwide referendum, thus taking this politically difficult matter out of the hands of the executive and legislative arms of the government.

WILLIAM G. MAHONEY

Long-range air pollution policies reviewed in Geneva

GENEVA—For the first time since the UN's transboundary air pollution agreement was reached last year, a working group met here (Oct. 27-31) to consider strategies and policies for abating long-range air pollution.

The Convention on Long-range Transboundary Air Pollution was unanimously adopted last year (WER, Nov. 19, 1979, p. 1) within the framework of the UN Economic Commission for Europe. It has 35 signatories—from member countries in Europe and North America as well as the European Economic Community—but so far only five have ratified the convention.

At this first working session, the Interim Executive Body reviewed the progress achieved at national levels and attempted to bring their policies and strategies closer together. They also moved to develop cooperation in other areas of the Convention, such as technologies for reducing emissions of sulphur compounds and other major air pollutants, and to determine their effects on human health and the environment. They also considered the implementation and further development of the cooperative program for monitoring and evaluating the long-range transmission of air pollutants in Europe.

WILLIAM G. MAHONEY

Med nations agree on a pact to protect marine areas



ATHENS—Delegates from 12 Mediterranean countries and the European Economic Community have agreed on the creation of a vast regional network of specially-protected marine areas and on the first text of a new Mediterranean treaty.

The agreements came at the end of a five-day conference, held here in October, on measures to save endangered species of animals, fish, birds and plants in the Mediterranean.

"We hadn't thought they'd move so far so fast," commented Marinos Yeroulanos, a leading Greek government environmentalist who chaired the conference.

The purpose of creating a network of protected zones aims first at protecting the breeding grounds of commercially exploitable fish and shellfish as well as certain endangered species, second at having a representative cross-section of Mediterranean ecosystems, and third at creating protected areas for tourists where they can be certain of finding safe swimming and sun-bathing

International cooperation ...

THE UN ECONOMIC COMMISSION for Europe (ECE) will hold a seminar in Salzburg, Austria, May 18-22, 1981, to study ways of reducing pollution from industrial gases containing harmful sulphur compounds. Before the seminar a study tour will be held in West Germany from May 13-15 at the invitation of the German Government.

The seminar will reach conclusions and make concrete recommendations, which may contribute to the implementation of the Convention on Long-Range Transboundary Air Pollution, an ECE spokesman said.

DAMES & MOORE, an American engineering and environmental consulting firm, recently completed a framework for the systematic analysis of environment programs being funded by the Asian Development Bank.

In doing so, Dames & Moore said it reviewed more than 40 of the bank's 1980 projects, representing 15 countries, and prepared a series of environmental profiles of the bank's developing member countries. The bank is now reviewing the consultants' proposals and will most likely begin to implement their suggestions early in 1981. A new office of the bank may be created to oversee the environmental reviews.

A SEARCH FOR GEOTHERMAL ENERGY sources is underway on the Mexico-U.S. border in a bilateral project being directed by the New Mexico Energy Institute of the U.S. Seventeen 100-foot test wells have been drilled in the border area of Columbua, N.M., and Palomas in Chihuahua. After readings were made, a 1,000-foot test well was begun. A temperature of 40 degrees Centigrade is expected from the test well, which will indicate a viable geothermal resource, said Larry Icerman, director of the New Mexico Energy Institute.

ZICHRON YAAKOV, in northern Israel, hosted an international seminar on afforestation problems in arid zones. Sponsored by the Jewish National Fund (JNF) in cooperation with the Germany-Israel Fund for International Research and Development, the seminar, which began October 19, drew participants from 20 countries, among them Thailand, Malawi, Sierra Leone, Ivory Coast, Kenya, Zambia, Spain, Portugal and Mexico.

During the seminar, participants visited JNF forests in Israel. Of a total 100,000 hectares of forest in Israel, 60,000 were planted by the JNF—the remainder being natural forests.

Forestry...

FIREWOOD is still a major fuel source in most countries and in Papua New Guinea, where modern power schemes exist side-by-side with wood cook-stoves, something is being done to improve firewood supplies.

Minerals and Energy Minister Gabriel Bakani has launched a program to improve the firewood supplies to Port Moresby so as to replace imported kerosene with charcoal. The department is assessing supply-and-demand of fuelwood, pricing, availability, and the environmental cost of reduced forest cover. Fuelwood sellers could secure supplies from controlled plantations.

A related project has been developing charcoal production in Port Moresby, and local charcoal is going for one sixth the price of charcoal imported from Malaysia and Australia.

A BRAZILIAN ADMINISTRATOR in the Manaus (Amazon) Free Zone thinks that the region's rain forests could be used for extensive wood alcohol production without harming the environment.

Rui Lins thinks that with "rational" plans for reforestation, as much as 500,000 barrels of alcohol—"green petroleum"—could be produced a day. He estimates that income from alcohol exports could reach \$16 billion a year, but it would involve cutting 200,000 square kilometers of wood every year, 4 percent of Brazil's total forestland.

Critics of the idea cite the example of the Trans-Amazon Roadway, which caused massive damage to the ecosystems of the rain forests, and the Amazon Jari project, which is gobbling huge areas of jungle land for paper pulp. The critics say that even with reforestation Lins' idea would cause irreparable damage.

CORRECTION

In the November 3 WER, p.4, the brief article beginning "Under pressure..." had a typographical error saying that Japan has 125,000 tons of unspent nuclear fuel; it should have said 125,000 tons of spent nuclear fuel.

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beaches, especially around historical, archaeological and aesthetic areas.

The conference was sponsored by the United Nations Environment Program (UNEP), in cooperation with the Food and Agriculture Organization, the International Union for Conservation of Nature and Natural Resources (IUCN) and UNESCO. A total of 40 participants took part in the meeting coming from Algeria, Tunisia, Libya, Israel, Turkey, Cyprus, Greece, Yugoslavia, Malta, Italy, Monaco and France, plus the EEC.

Aldo Manos, the Italian who coordinated the Mediterranean Action Plan, said that from a scientific point of view it was important that some protected areas be used for "baseline studies" of the ecosystems. In this way it will be possible to compare conditions in five, 10 or 20 years with what they are now. At present, there are about 15 well-organized marine parks, reserves and other protected areas in the Mediterranean.

Patricia Bliss-Guest, a legal affairs officer of UNEP, said that "an experts' meeting probably next spring or summer may be convened to put the finishing touches on the protocol and, if all goes well, we could have a treaty-signing ceremony late next year."

KYRIACOS CONDOULIS

Community forestry in India gets a prime ministerial push

NEW DELHI—India's Prime Minister Indira Gandhi has called for a "massive people's movement" to give impetus to the nation's social, or community, forestry program. It is, she told the Central Board of Forestry, a matter of "utmost urgency."

The federal government this year allocated Rs.45 million (\$6 million) for the social forestry program in an attempt to meet the fuel needs of 80 million families.

Forest conservation camps have been set up in Uttar Pradesh State (in the foothills of the Himalayas) to create environmental awareness and to organize public support for the program. In addition, the Central Forestry Commission has acquired all wastelands in 40 districts of the state for mini-forests and has imported seeds of fast-growing species.

The government of neighboring Himachal Pradesh, another Himalayan state, has plans to plant 30 million trees by next March.

India's former Inspector General of Forests, B.P. Srivastava, said that as fuelwood becomes more difficult to find, the use of cattle dung for fuel is robbing India of more than six million tons of fertilizer every year.

Environmentalist Murad Ali Baiq warned that if the alarming rate of deforestation is not checked, the results could be disastrous. He said that 8 billion tons of topsoil were being washed down the slopes of the Himalayas every year. Of the 75 million hectares of forested land, 20 percent was nearly worthless and 55 percent faced serious constraints because "local rights" allow people to cut trees. This left, he said, just 20 million hectares in good condition.

R. MURALI MANOHAR



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Norway's eco-budget up 11% while Sweden's is decreased

OSLO—The Norwegian government wants to increase by 10.8 percent the amount it will spend on environmental protection next year, up to \$151 million. The average budget increase for the Ministry of Environment had been 3.6 percent.

Norway has two giant clean-up projects underway: of Lake Mjoesa, the country's biggest lake (WER, July 28, p. 1) and a 10-year, \$1 billion air and water clean-up. These efforts will have priority during 1981, getting the biggest allotment of \$62 million if the Storting (parliament) approves the budget request.

Other major environmental projects include regional antipollution planning, environmental research, preparedness for offshore oil pollution, maintaining Norway's natural resources and increasing the refund paid for turning in junked cars, from \$118 to \$144 (WER, July 16, 1979, p. 1).

In **STOCKHOLM** the National Environment Protection Agency (NEPA) is proposing a reduced budget in line with the Swedish government's savings program and a change in emphasis on how NEPA spends its money.

Funding would be reduced from about \$87.5 million to \$80.7 million, or by about 8 percent.

For the first time NEPA proposes spending some \$13 million to stimulate new, improved techniques to care for the environment such as in the areas of traffic, industry, energy and waste handling. This investment in new techniques will be possible, NEPA said, because it plans to halt contributions to the construction of communal water purification plants and similar installations. It suggests the communities compensate for the loss by increasing water and sewage rates.

SPECIAL TO WER

Norway's national clean-up has cut emissions up to 90%

OSLO—Norway has reached the halfway mark in its massive 10-year national clean-up campaign by which industrial pollution is to be reduced to a minimum by the mid 1980s.

The Government launched the program in 1974 and allocated a sum of \$1 billion for it, of which about \$700 million have been spent so far.

The discharge of effluents into air and water has been reduced by between 40 and 90 percent in the case of the majority of polluting agents, according to the Ministry of Environment Affairs.

Discharges into water is the sector in which the largest

Environmental investments...

THE IAPANESE ENVIRONMENT AGENCY has demanded a budget allocation of \$230 million for fiscal 1981, up 12.6 percent from that of the current fiscal year. The budgetary request for the protection of lakes and marshes was increased by 71 percent, while that for other new environmental measures was increased by 70.5 percent. The agency also announced that priorities will be given to measures against environmental disruption caused by large-scale energy consumption, and by urbanization. Other plans for next year include the creation of a panel of experts to discuss energy-environment relations, a panel to collect data on global environmental pollution, and the imposition of stricter controls on the discharge of nitrogen oxides and pollutants into Lake Biwa, Shiga prefecture. Steps will also be taken to curb neighborhood noise nuisances, such as loud music.

A GRANT of Baht 10 million (\$500,000) has been given to Thailand by the European Economic Community (EEC) for the study of a project which will channel extra water from the Mekong River via the Ing, Yom and Nan Rivers to the Sirikit dam in northern Uttaradit province. The first stage of the study has already been carried out with the help of experts from Australia, Canada, and Japan.

The entire project will cost Baht 80 billion (\$4 billion) and will provide additional electricity and irrigation. The project is part of an effort to develop a vast area in the three river basins for agricultural purposes, said Deputy Agriculture Minister Dr. Anat Arbhabhirama.

ENVIRONMENTAL CONTROL EQUIPMENT for a newly integrated iron and steel works may reach 10 to 18 percent of total capital costs, states a UN Environment Program (UNEP) document on the iron and steel industry and the environment.

The report says rising energy and labor costs have led manufacturers to look for more efficient coking and steel-making processes, which are also able to meet more stringent environmental protection requirements. But any potential environmental benefits of such new approaches are unlikely to be felt before the end of the century without drastic changes in investment trends.

The report, Industry and Environment, Vol. 3, No. 2, is published by UNEP, 17 rue Margueritte, 75017 Paris, France.

reductions have been registered; for example, cadmium a 90 percent reduction, copper 80 percent and phosphorus 75 percent.

The figures so far are lower with regard to cleaner air. The greatest reduction in this sector are for nitric acids 55 percent and ammonia 50 percent.

When the campaign was started it was feared that costs of implementing the stringent requirements would lead to bank-ruptcies and the closing-down of companies, especially in the highly competitive export industry. But not a single concern has closed down for this reason alone. Environmental requirements have sometimes been one of several factors leading to shutdowns due to structural reorganization in, for example, the wood and fish processing industries.

After completion of the program, the campaign will be followed up with regular checks on the efficiency of cleaning systems, training of personnel operating polluting plants and finally a closer look at the remaining discharges and their damaging effects.

One still unsolved problem in connection with the environmental clean-up is the dumping of poisonous chemicals. In September it was revealed that, for instance, large quantities of creosote, which contains cancer-causing chemicals, had been dumped near Trondheim and that creosote had also leaked into a river by accident near Oslo. In both cases the creosote originated from the State Railway's plants for railroad ties. SPECIAL TO WER

Sweden centralizes control over transport of toxic goods

STOCKHOLM—The Swedish government is framing legislation to achieve better control over the movement of toxic and other goods dangerous to the environment.

The Transport Council would assume an all-embracing responsibility for such transport by road and rail, replacing several authorities. The first phase of the modernized code would become effective no later than January 1, 1982, as written by Rolf Sellgren, a Liberal Party member of parliament who was commissioned by the government to investigate the problems.

"We must clear away the jungle of regulations and officials now involved," commented Communications Minister Ulf Adelson. "Sellgren's proposal to introduce a framework law and place main responsibility for land transport in the hands of the Transport Council should simplify matters for the individual trucking firms and the authorities."

Sellgren's law would conform to Nordic and international law as well as the United Nations regulations.

In the second stage, Sellgren plans to present practical rules, for example, on how trucks should be built, which main highways may be used and how passage through built-up areas should be administered. "That is especially important," he said, "because many communities already have passed local traffic ordinances which aren't at all uniform."

Transport by sea and air will continue to be controlled by the shipping and air traffic bureaus.

SPECIAL TO WER

Criticism of UNEP's director is mounting among Europeans

NAIROBI—The row over the UN Environment Program's headquarters contract (WER, July 28, p.4) and the subsequent withholding of half the American contribution to UNEP (WER, Oct. 20, p.8) has brought increasing criticism of its executive director Mostafa Tolba.

Representatives of the nine European Community states based here have advised their governments to oppose Tolba's reappointment when the issue comes up at the UN General Assembly in November, according to newspaper reports published here. The European representatives allege that Tolba's management is autocratic and that staff morale is low, and they say that the headquarters contract situation was handled "in a less than satisfactory manner" (after Arab and African protests, the contract did not go to the lowest bidder, an Israeli firm).

And because the U.S. is waiting to hear Tolba's General Assembly report on the contract situation before it releases \$5 million of its 1980 contribution, several UNEP programs are being held up.

For example, officials of the Environment Liaison Center (ELC), which coordinates environmental non-governmental organizations, confirmed a nearly complete withdrawal of UNEP funding for their programs. "This means that NGO participation in World Environment Day 1981 cannot get started, and the report on NGO activities for next year's UNEP governing council cannot be done," a Center officer said.

Executive officer Gary Gallon has asked UNEP to reconsider as, he says, the withholding of these funds has placed the liaison center in a serious financial crisis.

CHARLES HARRISON

FAO to give Europe's farmers help on alternative energy

ATHENS—The Food and Agriculture Organization's European members decided at their recent biennial meeting to form a new cooperative scientific research network, to help farmers utilize new and renewable energy sources. This network will be the 11th FAO cooperative research effort in European agriculture.

The week-long conference, held here in cooperation with the U.N. Economic Commission for Europe, also decided on further studies into agricultural manpower problems and on effective aid to farmers and rural workers, particularly the less privileged.

The representatives, from 26 European countries, called for increased agricultural development aid to Third World countries, and many states pledged continuing or increased contributions. The conferees agreed on the need to implement Director-General Edouard Saouma's plan of action to establish food reserves in case of acute and large-scale food shortages.

KYRIACOS CONDOULIS

Environmental management...

A HIGH-RANKING SPANISH official has begun a tour of Mediterranean countries in an attempt to whip up support for Spain as seat of the secretariat of the Mediterranean Action Plan.

Juan Diaz Nicolas, Under-Secretary of the Environment, is visiting Morocco, Tunisia and Malta in a first stage, pushing the suitability of the Mediterranean port city of Barcelona.

THE SMALLER CARIBBEAN ISLANDS are getting a step-by-step plan to deal with some of their most pressing environmental problems. It's a project complementary to the Caribbean Action Plan and aims to help the smaller islands get a general picture of their environmental health problems-caused primarily by poor waste management. The project will lay the groundwork for a program to monitor coastal water pollution and will assess the potential impact of development practices on the environment. Country-by-country profiles were to be ready by December and the project completed sometime in 1981. The Caribbean Community Secretariat (CARICOM) is technical coordinator and will work closely with the Pan American Health Organization and the Caribbean Development Bank. The UN Environment Program and CARICOM are sponsoring the project.

DENMARK'S FIRST ENVIRONMENTAL TECHNICIANS get their diplomas late in December, after a two-year training period that combines theoretical classwork and a good amount of practical training. The first group of 14 has studied environmental problems, ecology, biology, mathematics, statistics, data processing, chemistry, environmental law and a good bit more.

The two-year course, roughly equivalent to a junior college curriculum, was instituted to train environmental workers for such jobs as managing sewage plants and waterworks, supervising pure food laws and running industrial health programs.

IN HO CHI MINH CITY, delegates from Thailand, Laos and Vietnam held talks during late October on further developing the Mekong Basin.

In their ninth session, they reviewed progress being made on current projects and considered new programs for approval. Some of the proposed projects are: flood control, drainage, irrigation, hydroelectric, environmental surveys and a waste recycling plan for a pilot fish farm.

THE SOUTH KOREAN government has set up a 16-member council to settle claims arising from seaborne contamination and calculate compensation money. A Marine Contamination Control Counseling Committee has also been formed to help the government formulate and implement policies concerning marine contamination.

Water quality...

UNDER PRESSURE from its neighbors in the Pacific, Japan has temporarily scuttled plans to dump nuclear wastes on the ocean floor, the Japanese ambassador to Australia announced.

The first dumping was scheduled for October 1981, at a site about 990 kilometers southeast of Tokyo. Papua New Guinea, Fiji, the Solomons, Samoa and Australia all rejected the Japanese plan outright, while New Zealand insisted on strict international standards for such dumping.

The Japanese on Ogasawara Island, only 50 kilometers southwest of the proposed dumpsite, also opposed the idea. The government had planned to sink 10,000 sealed concrete drums in water 6000 meters deep. They claim that meets or exceeds guidelines established by the OECD Nuclear Energy Agency and the International Atomic Energy Agency.

Japan has about 125,000 tons of unspent nuclear fuel stockpiled, and dumping may still take place in two or three years.

JAPAN'S ISOTOPE ASSOCIATION recently admitted that it had dumped 37 drums of nuclear wastes containing cobalt 60 and cesium 137 into waters near Tokyo Bay.

Twenty-seven drums were dumped in 1955 to a depth of 1400 meters and 10 drums in 1957 to a depth of 2000-2500 meters. An association official said that the amounts of cobalt 60 and cesium 137 found recently were too small to contaminate marine life.

SOUTH KOREA HAS BEEN DUMPING low-level nuclear waste in the Sea of Japan for the past 10 years, Japan's Kyodo News Service reported. Kyodo said details of the dumping were disclosed by Lee Byung Hui, a member of South Korea's Atomic Power Commission. Lee admitted that low-level waste from radioactive isotopes for research and other purposes had been dumped in waters off South Korea's Uilung Island.

FISHERMEN FROM NORTHERN JAPAN, worried about their scallop grounds, have formally protested the return of Japan's only nuclear-powered ship to its home port of Ominato in Mutsu City, 725 kilometers north of Tokyo.

The 8,214-ton ship, called the Mutsu, officially has been homeless since it developed a reactor leak on its test run in 1974, two years after it was built at a cost of \$22 million. The test run had been delayed by fearful fishermen, and the ship has been idle since that time. Since 1978, it has been undergoing repairs in Sasebo, 465 kilometers southwest of Tokyo, but residents there are anxious for the Government to remove it.

The Mutsu had been heralded as a new age in merchant shipping for Japan.

Nile River data flows into a computer after 5 years' study

CAIRO—Virtually every ecological fact on the Nile River is going into a computerized water quality data bank set up by Egyptian and American scientists, not only for use in Egypt but as a model for other river systems.

The data bank is housed in Egypt's National Research Center and should be among the major accomplishments of a comprehensive seven-year study of one of the world's most important waterways. Already, project officials have recorded 50,000 items covering intake and effluent from industry, flow levels, and the overall biological status of the water. Since the project began in 1975, the Nile has been monitored by research teams stationed at points along the entire river, from Aswan to the Mediterranean.

The data bank, says Dr. Mohamed Ibrahim Younis of the National Research Center, will enable Egyptian officials to know, for example, the exact ecological condition of the river at a certain point. With that information, predictions can be made concerning the impact of industrial discharge, and appropriate legislation and regulation can be applied.

Systematic research on the Nile was begun six years ago in a joint venture between the Egyptian Academy of Scientific Research and Technology and the University of Michigan. The project, originally planned to end in 1980, has been extended for another two years with funding from the U.S. Environmental Protection Agency and the Ford Foundation.

The data bank should prove to be one of the less controversial products of the study, albeit one of the most significant.

Any study of the Nile River today must consider the impact of the Aswan High Dam, which in recent years has been blamed by a number of Egyptian and foreign scientists for having had a devastating effect on the environment and public health of Egypt.

The director of the project, Dr. Khalil H. Mancy of the School of Public Health at the University of Michigan, contends the goal of the research is not to determine once and for all if the Aswan High Dam is good or bad. The purpose, he has written, is to assess "present and future river quality conditions" and to "develop guidelines for the rational use of Nile resources in Egypt."

Nevertheless, in its initial reporting of results gathered to date, the project has challenged the basis of many of the accusations that have lately been leveled at the dam.

Within six years of its completion in 1968, Egyptians officials began to question the value of the dam, contending that (among other things) it has caused erosion of silt barriers along the Mediterranean coast, the spread of the parasitic disease bilharzia, and an increase in the salinity of agricultural land.

However, defenders of the dam cited a marked and beneficial decrease in the amount of water lost to the Mediterranean. Previously, approximately 40 percent of the annual Nile discharge flowed ineffectively into the sea. But with the dam, it has been pointed out, there was enough water to bring 1 million hectares of existing Egyptian farmland under perennial irrigation, allowing year-round farming. At the same time, more water was made available for the reclamation of barren, arid land, desperately needed

for agricultural and housing expansion.

And, with its 12 turbines, the dam now provides the country more than half its electric power.

Dr. Mancy readily acknowledges that the dam has changed the ecology of Egypt but argues that in most cases where the effects have been harmful the fault lies not with the dam but with a failure to prepare facilities that could have lessened the impact. Planners and officials, he says, were aware of what the dam would do to the environment but simply failed to act promptly.

Prior to the dam between 60 and 180 million tons of silt used to be deposited annually in the Mediterranean. Now, this silt has been held back in the reservoir behind the dam, meaning that portions of the Mediterranean coastline have begun to erode in the absence of silt barriers. "Undoubtedly," Dr. Mancy says, "certain stretches of the coastline have to be strengthened in order to minimize the effect of sea erosion."

As for the problem of salinity, Dr. Mancy agrees that with the dam there is more water available for longer periods of time. That has caused salt to be flushed out of the soil, increasing the salinity of irrigation water and damaging crops. But, he asserts, it is "erroneous" to blame the dam for this; the problem has been that more water has been used without the construction of a sufficient number of drainage facilities. Where tile drainage has been introduced, he says, salinity is no longer severe.

Finally, the Nile River team conducted a survey of more than 20,000 Egyptians in 47 villages throughout the country and, contrary to expectations, found a declining trend in the prevalence of bilharzia. The finding, he believes, is attributable to the fact that there has been no significant expansion in the amount of perennially irrigated land as an equivalent amount has been urbanized. Other reasons are the migration of large segments of the population from the country to the city and an improvement in clean water supplies and health education. The disease is still a scourge in Egypt but there are proportionately fewer Egyptians suffering from it.

NATHANIEL HARRISON



West Africa threatened with a plague of locusts

NAIROBI—The biggest locust swarms since 1941 are threatening several West African countries—mainly due to the continuing civil war in Chad, which halted locust control operations in the Lake Chad basin at a time of exceptionally heavy breeding.

The threat this time is from the African migratory locust—a different species from the desert locust which threatened eastern

Agriculture . . .

TOP MEXICAN SCIENTISTS are trying to prevent the deterioration of the country's southeastern jungles by giant cattle ranching businesses

Dr. Gonzalo Halffter, director of the National Institute of Ecology, and Dr. Arturo Gomez Pompa, director of the National Institute for the Investigation of Biological Resources, say they are trying to avert a disaster that is already happening in parts of Brazil's Amazon Basin. They warned against international financial concerns and transnational cattle ranching businesses that are trying to open up large areas of southeast Mexico. The scientists argue that the land should be used for agricultural and forestry projects, and that cattle ranching should be confined to Mexico's northern states.

DURING CONSERVATION WEEK in Venezuela, Sept. 26-Oct. 4, several environmental programs were launched.

To encourage small farmers, nurseries will be established so trees can be sold to the National Reforestation Company. Communal forests in degraded land around settlements were to be developed and 800,000 saplings planted during Conservation Week alone.

In selected cities, the National Parks Institute and Education Ministry will cooperate in pilot programs to stimulate planting school gardens and recycling waste products. Primary school teachers will be offered workshops in nature studies, zoology and conservation. The Ministry plans to extend its environmental education program progressively across the country.

FOR THE FIRST TIME a major international lending agency, the World Bank, is giving tangible support to Indonesia's efforts to develop a system of national parks and reserves.

The bank is lending money to help turn North Sulawesi's Dumoga Wildlife Reserve into a new national park. This will accomplish two goals—protecting the Dumoga watershed to ensure a regular supply of water to irrigation systems in the Dumoga Valley and preserving the ecosystems of the parkland. Under a subcontract, the IUCN and World Wildlife Fund will help Indonesia's Directorate of Nature Conservation improve its capability to manage the park and to integrate its role with that of other development agencies.

A THREE-MONTH TRAINING COURSE in water and soil conservation techniques recently began in Beijing as part of the effort to reduce soil erosion and achieve an ecological balance. It is being attended by more than 60 technicians from water and soil conservation research institutes and experimental stations in 21 provinces and autonomous regions.

Wildlife...

BRIGITTE BARDOT, WHERE ARE YOU? Dr. Juan Grau, founder-president of the Ecological Institute of Chile, is waiting to hear from you. The French movie star promised to help him launch a world-wide campaign to save the chinchilla but, he reported, "she hasn't done anything yet." Dr. Grau says there are just a few wild colonies of chinchillas left in Chile, so he started his own breeding farm to keep the species going. "I'm desperate for help," he says, even if it's not from Mile. Bardot.

PHILIPPINES PRESIDENT Ferdinand Marcos has set up a special task force to stop the poaching of the green sea turtle and to encourage people to save the reptile from extinction. The government has also been urged to designate some of the country's 7,000-plus islands as sanctuaries for the turtle, scientifically known as Chelonia mudas latrielle. The sea turtle, unfortunately, can be put to many commercial uses. Its shell is made into combs, buttons and cufflinks, while its leathery neck is fashioned into belts and handbags. Philippine villagers believe its fresh blood and liver have medicinal value, especially in the treatment of asthma. The soft shelled turtle eggs are also considered a nutritious delicacy. The Philippines is now trying to find out more about its biology so that the turtle can be artificially propagated and reared in turtle ponds.

ONE OF THE LAST TRULY WILD PARTS of Africa, the Okavango swamps of Botswana, are to be sprayed against tse-tse fly in a massive campaign by the government of Dr. Quett Masire.

The plan has already caused a storm in wildlife circles as spraying could lead to the destruction of several species in the swamps, which cover a large area in the northern part of the country.

According to tender advertisements, the \$6 million spraying is due to begin in 1982. Botswana's economy is closely tied to cattle raising and the fly is causing havoc in many areas.

Conservationists are protesting that the insecticide to be used, endosulphan, is extremely toxic to fish and their predators. Also, they say, eradication of the tse-tse fly will encourage tribespeople to drive cattle into the swamp fringes, further destroying wildlife by overgrazing a fragile ecosystem. But scientists in Botswana say endosulphan will be used in such small overall quantities that wildlife will hardly be affected.

Africa two years ago, when wars in the Horn of Africa interfered with control operations.

U.N. officials report the presence of large swarms of the African migratory locust in parts of Nigeria and Cameroun. The affected area covers around 400,000 square kilometers, and ground control operations and aerial spraying are now being stepped up in a bid to destroy the breeding locusts before they can move further south.

Herbert Alomenu, director-general of the African Migratory Locust Control Organization, says the insects are breeding in areas with large cattle populations whose grazing is threatened. If they move further south on the prevailing winds, they will menace the rich agricultural areas of Nigeria, Benin, Togo and Ghana.

More than \$600,000 has been released by the Food and Agriculture Organization and the U.N. Development Program for the control program, but more funds may be needed later.

This possible plague of locusts is just one more potential disaster for Africa: Most of the Sahel region of West Africa is already threatened by drought, and an equally serious drought is now affecting the eastern side of Africa, from Ethiopia and the Sudan down to South Africa.

One of the few bright spots in a gloomy picture is that the desert locust, in eastern Africa, is at present under control. Thanks to an all-out effort to control breeding in the Horn of Africa and in southwest Arabia, there are no signs of any large-scale swarms.

CHARLES HARRISON

Japan negotiating on breeding endangered species overseas

TOKYO—The Japanese government is considering establishing breeding grounds abroad for endangered species. They would supply manufacturers with skins and other products now that Japan has ratified CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

An official of the Wildlife Protection Section of the Environment Agency said the Foreign Ministry is negotiating with Pakistan and India to see whether it would be possible to establish breeding facilities there for lizards, a valuable source of leather. He also said that the Ministry of International Trade and Industry is studying the feasibility of crocodile farms in New Guinea and Indonesia. And the Tokyo Municipal Government in cooperation with the Agriculture, Forestry and Fisheries Ministry is already operating a test breeding center for turtles on Japan's Bonin Islands, 960 kilometers south of Tokyo.

When the Japanese Diet (parliament) finally ratified CITES, after seven years of opposition led by manufacturers and traders, it did specify nine reservations to the treaty: three turtles (green, hawksbill and ridley), three lizards (Bengal, yellow and desert), the salt-water crocodile, fin whale and musk deer.

Yoji Onuma, managing director of the World Wildlife Fund Japan, said these reservations are expected to last only a few years, just long enough for the government to help secure the livelihood of manufacturers.

SPECIAL TO WER

Mrs. Gandhi to head India's new environment department

NEW DELHI—India's Prime Minister Mrs. Gandhi will soon head a new department of the environment.

A 14-member expert committee, which submitted its report to her September 17, had reviewed existing environmental legislation and suggested a comprehensive approach. They recommended that the new Department of Environmental Protection be under her direct charge and that environment be included in the concurrent list of the Indian Constitution (this means that both federal and state governments take responsibility for tackling environmental problems).

The new department will take a "watchdog role," bringing to the attention of governments and parliament instances, causes and consequences of environmental degradation in all sectors.

When the new department is set up, it will control all organizations and activities which are concerned with land and water management, wildlife, environmental planning and water pollution control.

R. MURALI MANOHAR

A massive river-damming plan proposed to irrigate India



NEW DELHI—India's Ministry of Irrigation and the Central Water Commission have proposed a \$62.5 billion plan to dam the great rivers of India. They claim that the scheme would irrigate 35 million hectares of land and that it would generate about 40 million kilowatts of power.

The plan has two parts. Under the first, the Himalayan Rivers Development plan, storage dams and canals would be built on the Ganges, the Brahmaputra, and their tributaries. But the Brahmaputra flows through Bangladesh to the sea, so there could be serious political repercussions if such dams were ever built.

Part two, the Peninsular Rivers Development plan, calls for the transfer of surplus water from the Mahanadi and Godavari to the Krishna, Pennar and Cauvery, all of which flow across the southern subcontinent. Most helped by this plan would be the southern drought-plagued states, where the water is needed primarily for irrigation.

If effected, the plan—called the "National Perspective for Water Resources Deelopment"—would also increase the supply of drinking water and improve flood control.

R. MURALI MANOHAR

Environment & Development . . .

THE LARGEST DAM IN LATIN AMERICA will start going up next year in northeast Mexico.

The dam is to be built in an agricultural district of the state of San Luis Potosi and will cost \$174 million. It will have a capacity of 3.7 million cubic meters of water and will irrigate more than 200,000 hectares of farmland. The project is expected to take 11 years to finish and will drown six existing villages, displacing 22,000 people.

VENEZUELA'S ENVIRONMENTAL MINISTRY is currently developing programs to protect important water basins through reforestation, fire control and environmental education.

Forty rivers north and south of the Orinoco hold more than 95 percent of Venezuela's hydroelectric potential, or 30,000 megawatts, the equivalent in energy terms of a million barrels a day of petroleum.

To protect this potential energy source, the Ministry has hired peasant families to reforest the steep land around tributaries of the Santo Domingo River to prevent sedimentation of the Jose Antonio Paez dam.

NEPAL is planning to turn 50,850 hectares of land into communal forests during the next five years to meet the increasing need for firewood. The indiscriminate collecting of firewood, timber, and fodder has been the main cause of a 25 percent depletion of Nepal's forest area during the last 10 years to only 4.5 million hectares at present. The project, named Community Forest Development, will benefit about 1.9 million people. Reforestation projects are relatively new in Nepal. It was only in 1976 that the Government planned its first comprehensive forestry project, trying to return to the villagers the responsibility for forest development and protection which was taken from them when Nepal's private forests were nationalized in 1957.

THE TRANSPORT MINISTRY of Japan has approved a plan to use garbage from waterfront areas of Tokyo and Osaka to reclaim land. The reclaimed land will be used for building large-scale garbage disposal plants as well as port facilities and city development. The total cost of the project is estimated at 700 billion yen (\$2 billion). Construction will start in 1981. Environmental maintenance organizations will be set up to supervise the work of land reclamation. The Osaka organization will be established in 1981, and the Tokyo organization the following year. An estimated 1,200 hectares of land will be reclaimed in Tokyo Bay and 800 hectares in Osaka Bay.

Ocean management . . .

FOLLOWING THE BETELGUESE TANKER DI-SASTER in Bantry Bay, Ireland, new regulations to control dangerous shipping are being proposed by the European Commission in a directive which could be implemented before the end of the year.

Irish Transport Commissioner Richard Burke said he was proposing to the Council of Ministers that dangerous shipping entering E.E.C. waters would be held in European ports until the ships were repaired. He said that sufficient legislation already existed for E.E.C. member states to inspect shipping, but some were not as zealous as others in carrying out their usage of these powers. The Commission was now proposing to force these states to take action.

AN OIL SPILL CONTINGENCY PLAN, part of the Action Plan for the Wider Caribbean, will be considered at a meeting of experts in January.

The draft contingency plan, produced this fall in Barbados, reflects the views of representatives of all the Caribbean islands plus observers from the wider Caribbean area. Project support has come from the Agency for International Development, the UN Environment Program and the Organization of American States. The Inter-governmental Maritime Consultative Organization has provided personnel.

AUSTRALIA'S GREAT BARRIER REEF is being threatened again—this time not by the specter of oil drilling but by an indigenous enemy, the Crown of Thorns starfish.

The starfish feed on the living coral, and they have become a plague in the reefs around Green Island near the city of Cairns. Under a campaign started by the Queensland Fisheries Service, divers are injecting some starfish with copper sulphate which slowly kills off the population. Still their number increases.

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ANALYSIS: Why fish stocks are dwindling

JOHANNESBURG—California's bountiful pilchard industry was wiped out in the 1940s. At the time, fishing industry scientists attributed it to "a spawning failure—an act of God."



Since then many of the world's once-prolific fisheries have experienced the same disaster, and Dr. Jan Lochner, a South African population dynamics expert, argues that the problem is distinctly man-made. Lochner predicted the collapse of South Africa's pilchard industry twelve years ago; his warning was ignored, and today catches are down 90 percent. Only a few thousand tons will be caught this year. The anchovy population, which had swelled in response to the loss, may be the next catch in danger of collapse. Namibia's anchovy catch, potentially 2.5 million tons a year, is set at 180,000 tons this year. But it may fall short of that.

Dr. Lochner's warnings were ignored for two reasons. First, at the time of his prediction catches were still increasing; signs of depletion had not yet been seen. Second, Lochner is not a biologist; he was considered an interloper. He irritated biologists in the industry by accusing them of blind ignorance for placing too much emphasis on mathematical analysis and ignoring cyclic patterns being repeated in fishing grounds around the world.



Now, the fishing industry is beginning to heed Dr. Lochner's advice. He told WER his basic theory of fisheries management: "The number of fish available to an industry can be calculated year by year, provided catch statistics are available over a number of years. In simple terms it entails having to determine the age of first sexual maturity of the species of fish concerned; only then can you discover the critical point between wise exploitation of the resource and overfishing." He said that increased fishing can raise the productivity of a population, but when over 50 percent are caught in successive years the population becomes too young to reproduce and it collapses.

Dr. Lochner has proposed a solution for the South African fishing industry—switching the fishing season from winter to summer. He suggests that the season in South Africa last from early October to the end of March so that immature fish can reach reproductive age during the Southern Hemisphere's winter. Lochner says that his plan would treble the individual weight of anchovies and that at least 75 percent would have a chance to reproduce. And he predicts that anchovy catches in the region could reach 3.5 billion tons a year.

JAMES CLARKE





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Norway's eco-budget up 11% while Sweden's is decreased

OSLO—The Norwegian government wants to increase by 10.8 percent the amount it will spend on environmental protection next year, up to \$151 million. The average budget increase for the Ministry of Environment had been 3.6 percent.

Norway has two giant clean-up projects underway: of Lake Mjoesa, the country's biggest lake (WER, July 28, p. 1) and a 10-year, \$1 billion air and water clean-up. These efforts will have priority during 1981, getting the biggest allotment of \$62 million if the Storting (parliament) approves the budget request.

Other major environmental projects include regional antipollution planning, environmental research, preparedness for offshore oil pollution, maintaining Norway's natural resources and increasing the refund paid for turning in junked cars, from \$118 to \$144 (WER, July 16, 1979, p. 1).

In **STOCKHOLM** the National Environment Protection Agency (NEPA) is proposing a reduced budget in line with the Swedish government's savings program and a change in emphasis on how NEPA spends its money.

Funding would be reduced from about \$87.5 million to \$80.7 million, or by about 8 percent.

For the first time NEPA proposes spending some \$13 million to stimulate new, improved techniques to care for the environment such as in the areas of traffic, industry, energy and waste handling. This investment in new techniques will be possible, NEPA said, because it plans to halt contributions to the construction of communal water purification plants and similar installations. It suggests the communities compensate for the loss by increasing water and sewage rates.

SPECIAL TO WER

Norway's national clean-up has cut emissions up to 90%

OSLO—Norway has reached the halfway mark in its massive 10-year national clean-up campaign by which industrial pollution is to be reduced to a minimum by the mid 1980s.

The Government launched the program in 1974 and allocated a sum of \$1 billion for it, of which about \$700 million have been spent so far.

The discharge of effluents into air and water has been reduced by between 40 and 90 percent in the case of the majority of polluting agents, according to the Ministry of Environment Affairs.

Discharges into water is the sector in which the largest

Environmental investments...

THE JAPANESE ENVIRONMENT AGENCY has demanded a budget allocation of \$230 million for fiscal 1981, up 12.6 percent from that of the current fiscal year. The budgetary request for the protection of lakes and marshes was increased by 71 percent, while that for other new environmental measures was increased by 70.5 percent. The agency also announced that priorities will be given to measures against environmental disruption caused by large-scale energy consumption, and by urbanization. Other plans for next year include the creation of a panel of experts to discuss energy-environment relations, a panel to collect data on global environmental pollution, and the imposition of stricter controls on the discharge of nitrogen oxides and pollutants into Lake Biwa, Shiga prefecture. Steps will also be taken to curb neighborhood noise nuisances, such as loud music.

A GRANT of Baht 10 million (\$500,000) has been given to Thailand by the European Economic Community (EEC) for the study of a project which will channel extra water from the Mekong River via the Ing, Yom and Nan Rivers to the Sirikit dam in northern Uttaradit province. The first stage of the study has already been carried out with the help of experts from Australia, Canada, and Japan.

The entire project will cost Baht 80 billion (\$4 billion) and will provide additional electricity and irrigation. The project is part of an effort to develop a vast area in the three river basins for agricultural purposes, said Deputy Agriculture Minister Dr. Anat Arbhabhirama.

ENVIRONMENTAL CONTROL EQUIPMENT for a newly integrated iron and steel works may reach 10 to 18 percent of total capital costs, states a UN Environment Program (UNEP) document on the iron and steel industry and the environment.

The report says rising energy and labor costs have led manufacturers to look for more efficient coking and steel-making processes, which are also able to meet more stringent environmental protection requirements. But any potential environmental benefits of such new approaches are unlikely to be felt before the end of the century without drastic changes in investment trends.

The report, Industry and Environment, Vol. 3, No. 2, is published by UNEP, 17 rue Margueritte, 75017 Paris, France.

reductions have been registered; for example, cadmium a 90 percent reduction, copper 80 percent and phosphorus 75 percent.

The figures so far are lower with regard to cleaner air. The greatest reduction in this sector are for nitric acids 55 percent and ammonia 50 percent.

When the campaign was started it was feared that costs of implementing the stringent requirements would lead to bank-ruptcies and the closing-down of companies, especially in the highly competitive export industry. But not a single concern has closed down for this reason alone. Environmental requirements have sometimes been one of several factors leading to shutdowns due to structural reorganization in, for example, the wood and fish processing industries.

After completion of the program, the campaign will be followed up with regular checks on the efficiency of cleaning systems, training of personnel operating polluting plants and finally a closer look at the remaining discharges and their damaging effects.

One still unsolved problem in connection with the environmental clean-up is the dumping of poisonous chemicals. In September it was revealed that, for instance, large quantities of creosote, which contains cancer-causing chemicals, had been dumped near Trondheim and that creosote had also leaked into a river by accident near Oslo. In both cases the creosote originated from the State Railway's plants for railroad ties. SPECIAL TO WER

Sweden centralizes control over transport of toxic goods

STOCKHOLM—The Swedish government is framing legislation to achieve better control over the movement of toxic and other goods dangerous to the environment.

The Transport Council would assume an all-embracing responsibility for such transport by road and rail, replacing several authorities. The first phase of the modernized code would become effective no later than January 1, 1982, as written by Rolf Sellgren, a Liberal Party member of parliament who was commissioned by the government to investigate the problems.

"We must clear away the jungle of regulations and officials now involved," commented Communications Minister Ulf Adelson. "Sellgren's proposal to introduce a framework law and place main responsibility for land transport in the hands of the Transport Council should simplify matters for the individual trucking firms and the authorities."

Sellgren's law would conform to Nordic and international law as well as the United Nations regulations.

In the second stage, Sellgren plans to present practical rules, for example, on how trucks should be built, which main highways may be used and how passage through built-up areas should be administered. "That is especially important," he said, "because many communities already have passed local traffic ordinances which aren't at all uniform."

Transport by sea and air will continue to be controlled by the shipping and air traffic bureaus.

SPECIAL TO WER

Criticism of UNEP's director is mounting among Europeans

NAIROBI—The row over the UN Environment Program's headquarters contract (WER, July 28, p.4) and the subsequent withholding of half the American contribution to UNEP (WER, Oct. 20, p.8) has brought increasing criticism of its executive director Mostafa Tolba.

Representatives of the nine European Community states based here have advised their governments to oppose Tolba's reappointment when the issue comes up at the UN General Assembly in November, according to newspaper reports published here. The European representatives allege that Tolba's management is autocratic and that staff morale is low, and they say that the headquarters contract situation was handled "in a less than satisfactory manner" (after Arab and African protests, the contract did not go to the lowest bidder, an Israeli firm).

And because the U.S. is waiting to hear Tolba's General Assembly report on the contract situation before it releases \$5 million of its 1980 contribution, several UNEP programs are being held up.

For example, officials of the Environment Liaison Center (ELC), which coordinates environmental non-governmental organizations, confirmed a nearly complete withdrawal of UNEP funding for their programs. "This means that NGO participation in World Environment Day 1981 cannot get started, and the report on NGO activities for next year's UNEP governing council cannot be done," a Center officer said.

Executive officer Gary Gallon has asked UNEP to reconsider as, he says, the withholding of these funds has placed the liaison center in a serious financial crisis.

CHARLES HARRISON

FAO to give Europe's farmers help on alternative energy

ATHENS—The Food and Agriculture Organization's European members decided at their recent biennial meeting to form a new cooperative scientific research network, to help farmers utilize new and renewable energy sources. This network will be the 11th FAO cooperative research effort in European agriculture.

The week-long conference, held here in cooperation with the U.N. Economic Commission for Europe, also decided on further studies into agricultural manpower problems and on effective aid to farmers and rural workers, particularly the less privileged.

The representatives, from 26 European countries, called for increased agricultural development aid to Third World countries, and many states pledged continuing or increased contributions. The conferees agreed on the need to implement Director-General Edouard Saouma's plan of action to establish food reserves in case of acute and large-scale food shortages.

KYRIACOS CONDOULIS

Environmental management...

A HIGH-RANKING SPANISH official has begun a tour of Mediterranean countries in an attempt to whip up support for Spain as seat of the secretariat of the Mediterranean Action Plan.

Juan Diaz Nicolas, Under-Secretary of the Environment, is visiting Morocco, Tunisia and Malta in a first stage, pushing the suitability of the Mediterranean port city of Barcelona.

THE SMALLER CARIBBEAN ISLANDS are getting a step-by-step plan to deal with some of their most pressing environmental problems. It's a project complementary to the Caribbean Action Plan and aims to help the smaller islands get a general picture of their environmental health problems-caused primarily by poor waste management. The project will lay the groundwork for a program to monitor coastal water pollution and will assess the potential impact of development practices on the environment. Country-by-country profiles were to be ready by December and the project completed sometime in 1981. The Caribbean Community Secretariat (CARICOM) is technical coordinator and will work closely with the Pan American Health Organization and the Caribbean Development Bank. The UN Environment Program and CARICOM are sponsoring the project.

DENMARK'S FIRST ENVIRONMENTAL TECHNICIANS get their diplomas late in December, after a two-year training period that combines theoretical classwork and a good amount of practical training. The first group of 14 has studied environmental problems, ecology, biology, mathematics, statistics, data processing, chemistry, environmental law and a good bit more.

The two-year course, roughly equivalent to a junior college curriculum, was instituted to train environmental workers for such jobs as managing sewage plants and waterworks, supervising pure food laws and running industrial health programs.

IN HO CHI MINH CITY, delegates from Thailand, Laos and Vietnam held talks during late October on further developing the Mekong Basin.

In their ninth session, they reviewed progress being made on current projects and considered new programs for approval. Some of the proposed projects are: flood control, drainage, irrigation, hydroelectric, environmental surveys and a waste recycling plan for a pilot fish farm.

THE SOUTH KOREAN government has set up a 16-member council to settle claims arising from seaborne contamination and calculate compensation money. A Marine Contamination Control Counseling Committee has also been formed to help the government formulate and implement policies concerning marine contamination.

Water quality...

UNDER PRESSURE from its neighbors in the Pacific, Japan has temporarily scuttled plans to dump nuclear wastes on the ocean floor, the Japanese ambassador to Australia announced.

The first dumping was scheduled for October 1981, at a site about 990 kilometers southeast of Tokyo. Papua New Guinea, Fiji, the Solomons, Samoa and Australia all rejected the Japanese plan outright, while New Zealand insisted on strict international standards for such dumping.

The Japanese on Ogasawara Island, only 50 kilometers southwest of the proposed dumpsite, also opposed the idea. The government had planned to sink 10,000 sealed concrete drums in water 6000 meters deep. They claim that meets or exceeds guidelines established by the OECD Nuclear Energy Agency and the International Atomic Energy Agency.

Japan has about 125,000 tons of unspent nuclear fuel stockpiled, and dumping may still take place in two or three years.

JAPAN'S ISOTOPE ASSOCIATION recently admitted that it had dumped 37 drums of nuclear wastes containing cobalt 60 and cesium 137 into waters near Tokyo Bay.

Twenty-seven drums were dumped in 1955 to a depth of 1400 meters and 10 drums in 1957 to a depth of 2000-2500 meters. An association official said that the amounts of cobalt 60 and cesium 137 found recently were too small to contaminate marine life.

SOUTH KOREA HAS BEEN DUMPING low-level nuclear waste in the Sea of Japan for the past 10 years, Japan's Kyodo News Service reported. Kyodo said details of the dumping were disclosed by Lee Byung Hui, a member of South Korea's Atomic Power Commission. Lee admitted that low-level waste from radioactive isotopes for research and other purposes had been dumped in waters off South Korea's Uilung Island.

FISHERMEN FROM NORTHERN JAPAN, worried about their scallop grounds, have formally protested the return of Japan's only nuclear-powered ship to its home port of Ominato in Mutsu City, 725 kilometers north of Tokyo.

The 8,214-ton ship, called the Mutsu, officially has been homeless since it developed a reactor leak on its test run in 1974, two years after it was built at a cost of \$22 million. The test run had been delayed by fearful fishermen, and the ship has been idle since that time. Since 1978, it has been undergoing repairs in Sasebo, 465 kilometers southwest of Tokyo, but residents there are anxious for the Government to remove it.

The Mutsu had been heralded as a new age in merchant shipping for Japan.

Nile River data flows into a computer after 5 years' study

CAIRO—Virtually every ecological fact on the Nile River is going into a computerized water quality data bank set up by Egyptian and American scientists, not only for use in Egypt but as a model for other river systems.

The data bank is housed in Egypt's National Research Center and should be among the major accomplishments of a comprehensive seven-year study of one of the world's most important waterways. Already, project officials have recorded 50,000 items covering intake and effluent from industry, flow levels, and the overall biological status of the water. Since the project began in 1975, the Nile has been monitored by research teams stationed at points along the entire river, from Aswan to the Mediterranean.

The data bank, says Dr. Mohamed Ibrahim Younis of the National Research Center, will enable Egyptian officials to know, for example, the exact ecological condition of the river at a certain point. With that information, predictions can be made concerning the impact of industrial discharge, and appropriate legislation and regulation can be applied.

Systematic research on the Nile was begun six years ago in a joint venture between the Egyptian Academy of Scientific Research and Technology and the University of Michigan. The project, originally planned to end in 1980, has been extended for another two years with funding from the U.S. Environmental Protection Agency and the Ford Foundation.

The data bank should prove to be one of the less controversial products of the study, albeit one of the most significant.

Any study of the Nile River today must consider the impact of the Aswan High Dam, which in recent years has been blamed by a number of Egyptian and foreign scientists for having had a devastating effect on the environment and public health of Egypt.

The director of the project, Dr. Khalil H. Mancy of the School of Public Health at the University of Michigan, contends the goal of the research is not to determine once and for all if the Aswan High Dam is good or bad. The purpose, he has written, is to assess "present and future river quality conditions" and to "develop guidelines for the rational use of Nile resources in Egypt."

Nevertheless, in its initial reporting of results gathered to date, the project has challenged the basis of many of the accusations that have lately been leveled at the dam.

Within six years of its completion in 1968, Egyptians officials began to question the value of the dam, contending that (among other things) it has caused erosion of silt barriers along the Mediterranean coast, the spread of the parasitic disease bilharzia, and an increase in the salinity of agricultural land.

However, defenders of the dam cited a marked and beneficial decrease in the amount of water lost to the Mediterranean. Previously, approximately 40 percent of the annual Nile discharge flowed ineffectively into the sea. But with the dam, it has been pointed out, there was enough water to bring 1 million hectares of existing Egyptian farmland under perennial irrigation, allowing year-round farming. At the same time, more water was made available for the reclamation of barren, arid land, desperately needed

for agricultural and housing expansion.

And, with its 12 turbines, the dam now provides the country more than half its electric power.

Dr. Mancy readily acknowledges that the dam has changed the ecology of Egypt but argues that in most cases where the effects have been harmful the fault lies not with the dam but with a failure to prepare facilities that could have lessened the impact. Planners and officials, he says, were aware of what the dam would do to the environment but simply failed to act promptly.

Prior to the dam between 60 and 180 million tons of silt used to be deposited annually in the Mediterranean. Now, this silt has been held back in the reservoir behind the dam, meaning that portions of the Mediterranean coastline have begun to erode in the absence of silt barriers. "Undoubtedly," Dr. Mancy says, "certain stretches of the coastline have to be strengthened in order to minimize the effect of sea erosion."

As for the problem of salinity, Dr. Mancy agrees that with the dam there is more water available for longer periods of time. That has caused salt to be flushed out of the soil, increasing the salinity of irrigation water and damaging crops. But, he asserts, it is "erroneous" to blame the dam for this; the problem has been that more water has been used without the construction of a sufficient number of drainage facilities. Where tile drainage has been introduced, he says, salinity is no longer severe.

Finally, the Nile River team conducted a survey of more than 20,000 Egyptians in 47 villages throughout the country and, contrary to expectations, found a declining trend in the prevalence of bilharzia. The finding, he believes, is attributable to the fact that there has been no significant expansion in the amount of perennially irrigated land as an equivalent amount has been urbanized. Other reasons are the migration of large segments of the population from the country to the city and an improvement in clean water supplies and health education. The disease is still a scourge in Egypt but there are proportionately fewer Egyptians suffering from it.

NATHANIEL HARRISON



West Africa threatened with a plague of locusts

NAIROBI—The biggest locust swarms since 1941 are threatening several West African countries—mainly due to the continuing civil war in Chad, which halted locust control operations in the Lake Chad basin at a time of exceptionally heavy breeding.

The threat this time is from the African migratory locust—a different species from the desert locust which threatened eastern

Agriculture . . .

TOP MEXICAN SCIENTISTS are trying to prevent the deterioration of the country's southeastern jungles by giant cattle ranching businesses.

Dr. Gonzalo Halffter, director of the National Institute of Ecology, and Dr. Arturo Gomez Pompa, director of the National Institute for the Investigation of Biological Resources, say they are trying to avert a disaster that is already happening in parts of Brazil's Amazon Basin. They warned against international financial concerns and transnational cattle ranching businesses that are trying to open up large areas of southeast Mexico. The scientists argue that the land should be used for agricultural and forestry projects, and that cattle ranching should be confined to Mexico's northern states.

DURING CONSERVATION WEEK in Venezuela, Sept. 26-Oct. 4, several environmental programs were launched.

To encourage small farmers, nurseries will be established so trees can be sold to the National Reforestation Company. Communal forests in degraded land around settlements were to be developed and 800,000 saplings planted during Conservation Week alone.

In selected cities, the National Parks Institute and Education Ministry will cooperate in pilot programs to stimulate planting school gardens and recycling waste products. Primary school teachers will be offered workshops in nature studies, zoology and conservation. The Ministry plans to extend its environmental education program progressively across the country.

FOR THE FIRST TIME a major international lending agency, the World Bank, is giving tangible support to Indonesia's efforts to develop a system of national parks and reserves.

The bank is lending money to help turn North Sulawesi's Dumoga Wildlife Reserve into a new. national park. This will accomplish two goals—protecting the Dumoga watershed to ensure a regular supply of water to irrigation systems in the Dumoga Valley and preserving the ecosystems of the parkland. Under a subcontract, the IUCN and World Wildlife Fund will help Indonesia's Directorate of Nature Conservation improve its capability to manage the park and to integrate its role with that of other development agencies.

A THREE-MONTH TRAINING COURSE in water and soil conservation techniques recently began in Beijing as part of the effort to reduce soil erosion and achieve an ecological balance. It is being attended by more than 60 technicians from water and soil conservation research institutes and experimental stations in 21 provinces and autonomous regions.

Wildlife...

BRIGITTE BARDOT, WHERE ARE YOU? Dr. Juan Grau, founder-president of the Ecological Institute of Chile, is waiting to hear from you. The French movie star promised to help him launch a world-wide campaign to save the chinchilla but, he reported, "she hasn't done anything yet." Dr. Grau says there are just a few wild colonies of chinchillas left in Chile, so he started his own breeding farm to keep the species going. "I'm desperate for help," he says, even if it's not from Mlle, Bardot.

PHILIPPINES PRESIDENT Ferdinand Marcos has set up a special task force to stop the poaching of the green sea turtle and to encourage people to save the reptile from extinction. The government has also been urged to designate some of the country's 7,000-plus islands as sanctuaries for the turtle, scientifically known as Chelonia mudas latrielle. The sea turtle, unfortunately, can be put to many commercial uses. Its shell is made into combs, buttons and cufflinks, while its leathery neck is fashioned into belts and handbags. Philippine villagers believe its fresh blood and liver have medicinal value, especially in the treatment of asthma. The soft shelled turtle eggs are also considered a nutritious delicacy. The Philippines is now trying to find out more about its biology so that the turtle can be artificially propagated and reared in turtle ponds.

ONE OF THE LAST TRULY WILD PARTS of Africa, the Okavango swamps of Botswana, are to be sprayed against tse-tse fly in a massive campaign by the government of Dr. Quett Masire.

The plan has already caused a storm in wildlife circles as spraying could lead to the destruction of several species in the swamps, which cover a large area in the northern part of the country.

According to tender advertisements, the \$6 million spraying is due to begin in 1982. Botswana's economy is closely tied to cattle raising and the fly is causing havoc in many areas.

Conservationists are protesting that the insecticide to be used, endosulphan, is extremely toxic to fish and their predators. Also, they say, eradication of the tse-tse fly will encourage tribespeople to drive cattle into the swamp fringes, further destroying wildlife by overgrazing a fragile ecosystem. But scientists in Botswana say endosulphan will be used in such small overall quantities that wildlife will hardly be affected.

Africa two years ago, when wars in the Horn of Africa interfered with control operations.

U.N. officials report the presence of large swarms of the African migratory locust in parts of Nigeria and Cameroun. The affected area covers around 400,000 square kilometers, and ground control operations and aerial spraying are now being stepped up in a bid to destroy the breeding locusts before they can move further south.

Herbert Alomenu, director-general of the African Migratory Locust Control Organization, says the insects are breeding in areas with large cattle populations whose grazing is threatened. If they move further south on the prevailing winds, they will menace the rich agricultural areas of Nigeria, Benin, Togo and Ghana.

More than \$600,000 has been released by the Food and Agriculture Organization and the U.N. Development Program for the control program, but more funds may be needed later.

This possible plague of locusts is just one more potential disaster for Africa: Most of the Sahel region of West Africa is already threatened by drought, and an equally serious drought is now affecting the eastern side of Africa, from Ethiopia and the Sudan down to South Africa.

One of the few bright spots in a gloomy picture is that the desert locust, in eastern Africa, is at present under control. Thanks to an all-out effort to control breeding in the Horn of Africa and in southwest Arabia, there are no signs of any large-scale swarms.

CHARLES HARRISON

Japan negotiating on breeding endangered species overseas

TOKYO—The Japanese government is considering establishing breeding grounds abroad for endangered species. They would supply manufacturers with skins and other products now that Japan has ratified CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora.

An official of the Wildlife Protection Section of the Environment Agency said the Foreign Ministry is negotiating with Pakistan and India to see whether it would be possible to establish breeding facilities there for lizards, a valuable source of leather. He also said that the Ministry of International Trade and Industry is studying the feasibility of crocodile farms in New Guinea and Indonesia. And the Tokyo Municipal Government in cooperation with the Agriculture, Forestry and Fisheries Ministry is already operating a test breeding center for turtles on Japan's Bonin Islands, 960 kilometers south of Tokyo.

When the Japanese Diet (parliament) finally ratified CITES, after seven years of opposition led by manufacturers and traders, it did specify nine reservations to the treaty: three turtles (green, hawksbill and ridley), three lizards (Bengal, yellow and desert), the salt-water crocodile, fin whale and musk deer.

Yoji Onuma, managing director of the World Wildlife Fund Japan, said these reservations are expected to last only a few years, just long enough for the government to help secure the livelihood of manufacturers.

SPECIAL TO WER

Mrs. Gandhi to head India's new environment department

NEW DELHI—India's Prime Minister Mrs. Gandhi will soon head a new department of the environment.

A 14-member expert committee, which submitted its report to her September 17, had reviewed existing environmental legislation and suggested a comprehensive approach. They recommended that the new Department of Environmental Protection be under her direct charge and that environment be included in the concurrent list of the Indian Constitution (this means that both federal and state governments take responsibility for tackling environmental problems).

The new department will take a "watchdog role," bringing to the attention of governments and parliament instances, causes and consequences of environmental degradation in all sectors.

When the new department is set up, it will control all organizations and activities which are concerned with land and water management, wildlife, environmental planning and water pollution control.

R. MURALI MANOHAR

A massive river-damming plan proposed to irrigate India



NEW DELHI—India's Ministry of Irrigation and the Central Water Commission have proposed a \$62.5 billion plan to dam the great rivers of India. They claim that the scheme would irrigate 35 million hectares of land and that it would generate about 40 million kilowatts of power.

The plan has two parts. Under the first, the Himalayan Rivers Development plan, storage dams and canals would be built on the Ganges, the Brahmaputra, and their tributaries. But the Brahmaputra flows through Bangladesh to the sea, so there could be serious political repercussions if such dams were ever built.

Part two, the Peninsular Rivers Development plan, calls for the transfer of surplus water from the Mahanadi and Godavari to the Krishna, Pennar and Cauvery, all of which flow across the southern subcontinent. Most helped by this plan would be the southern drought-plagued states, where the water is needed primarily for irrigation.

If effected, the plan—called the "National Perspective for Water Resources Deelopment"—would also increase the supply of drinking water and improve flood control.

R. MURALI MANOHAR

Environment & Development . . .

THE LARGEST DAM IN LATIN AMERICA will start going up next year in northeast Mexico.

The dam is to be built in an agricultural district of the state of San Luis Potosi and will cost \$174 million. It will have a capacity of 3.7 million cubic meters of water and will irrigate more than 200,000 hectares of farmland. The project is expected to take 11 years to finish and will drown six existing villages, displacing 22,000 people.

VENEZUELA'S ENVIRONMENTAL MINISTRY is currently developing programs to protect important water basins through reforestation, fire control and environmental education.

Forty rivers north and south of the Orinoco hold more than 95 percent of Venezuela's hydroelectric potential, or 30,000 megawatts, the equivalent in energy terms of a million barrels a day of petroleum.

To protect this potential energy source, the Ministry has hired peasant families to reforest the steep land around tributaries of the Santo Domingo River to prevent sedimentation of the Jose Antonio Paez dam.

NEPAL is planning to turn 50,850 hectares of land into communal forests during the next five years to meet the increasing need for firewood. The indiscriminate collecting of firewood, timber, and fodder has been the main cause of a 25 percent depletion of Nepal's forest area during the last 10 years to only 4.5 million hectares at present. The project, named Community Forest Development, will benefit about 1.9 million people. Reforestation projects are relatively new in Nepal. It was only in 1976 that the Government planned its first comprehensive forestry project, trying to return to the villagers the responsibility for forest development and protection which was taken from them when Nepal's private forests were nationalized in 1957.

THE TRANSPORT MINISTRY of Japan has approved a plan to use garbage from waterfront areas of Tokyo and Osaka to reclaim land. The reclaimed land will be used for building large-scale garbage disposal plants as well as port facilities and city development. The total cost of the project is estimated at 700 billion yen (\$2 billion). Construction will start in 1981. Environmental maintenance organizations will be set up to supervise the work of land reclamation. The Osaka organization will be established in 1981, and the Tokyo organization the following year. An estimated 1,200 hectares of land will be reclaimed in Tokyo Bay and 800 hectares in Osaka Bay.

Ocean management . . .

FOLLOWING THE BETELGUESE TANKER DI-SASTER in Bantry Bay, Ireland, new regulations to control dangerous shipping are being proposed by the European Commission in a directive which could be implemented before the end of the year.

Irish Transport Commissioner Richard Burke said he was proposing to the Council of Ministers that dangerous shipping entering E.E.C. waters would be held in European ports until the ships were repaired. He said that sufficient legislation already existed for E.E.C. member states to inspect shipping, but some were not as zealous as others in carrying out their usage of these powers. The Commission was now proposing to force these states to take action.

AN OIL SPILL CONTINGENCY PLAN, part of the Action Plan for the Wider Caribbean, will be considered at a meeting of experts in January.

The draft contingency plan, produced this fall in Barbados, reflects the views of representatives of all the Caribbean islands plus observers from the wider Caribbean area. Project support has come from the Agency for International Development, the UN Environment Program and the Organization of American States. The Inter-governmental Maritime Consultative Organization has provided personnel.

AUSTRALIA'S GREAT BARRIER REEF is being threatened again—this time not by the specter of oil drilling but by an indigenous enemy, the Crown of Thorns starfish.

The starfish feed on the living coral, and they have become a plague in the reefs around Green Island near the city of Cairns. Under a campaign started by the Queensland Fisheries Service, divers are injecting some starfish with copper sulphate which slowly kills off the population. Still their number increases.

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ANALYSIS: Why fish stocks are dwindling

JOHANNESBURG—California's bountiful pilchard industry was wiped out in the 1940s. At the time, fishing industry scientists attributed it to "a spawning failure—an act of God."



Since then many of the world's once-prolific fisheries have experienced the same disaster, and Dr. Jan Lochner, a South African population dynamics expert, argues that the problem is distinctly man-made. Lochner predicted the collapse of South Africa's pilchard industry twelve years ago; his warning was ignored, and today catches are down 90 percent. Only a few thousand tons will be caught this year. The anchovy population, which had swelled in response to the loss, may be the next catch in danger of collapse. Namibia's anchovy catch, potentially 2.5 million tons a year, is set at 180,000 tons this year. But it may fall short of that.

Dr. Lochner's warnings were ignored for two reasons. First, at the time of his prediction catches were still increasing; signs of depletion had not yet been seen. Second, Lochner is not a biologist; he was considered an interloper. He irritated biologists in the industry by accusing them of blind ignorance for placing too much emphasis on mathematical analysis and ignoring cyclic patterns being repeated in fishing grounds around the world.



Now, the fishing industry is beginning to heed Dr. Lochner's advice. He told WER his basic theory of fisheries management: "The number of fish available to an industry can be calculated year by year, provided catch statistics are available over a number of years. In simple terms it entails having to determine the age of first sexual maturity of the species of fish concerned; only then can you discover the critical point between wise exploitation of the resource and overfishing." He said that increased fishing can raise the productivity of a population, but when over 50 percent are caught in successive years the population becomes too young to reproduce and it collapses.

Dr. Lochner has proposed a solution for the South African fishing industry—switching the fishing season from winter to summer. He suggests that the season in South Africa last from early October to the end of March so that immature fish can reach reproductive age during the Southern Hemisphere's winter. Lochner says that his plan would treble the individual weight of anchovies and that at least 75 percent would have a chance to reproduce. And he predicts that anchovy catches in the region could reach 3.5 billion tons a year.

JAMES CLARKE



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NEW NAME

WER's publisher has a new name—one that is much easier to remember—the World Environment Center. We used to be the Center for International Environment Information.

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on resource management and conservation 1

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USAID to give resource management information

WASHINGTON—The U.S. Agency for International Development (AID) plans to spend \$2.3 million over the next four years for a new program to ensure that every development project stamped "AID" bears the mark of wise resource management and conservation.

In the past, AID spent its money almost exclusively on conventional development projects, a policy that drew criticism—and eventually a lawsuit—from U.S. environmental groups. A settlement of that lawsuit in 1977 required AID to include an environmental assessment of every project it undertakes. Now, AID plans to upgrade its resource management expertise because, project designer Peter Freeman said, the agency "realized that [AID] projects weren't really taking into account the degraded state of Third World environments." The object of this latest effort, which goes by the bureaucratic title of "Environment and Natural Resources Expanded Information Base," is to ensure that developing countries can turn to AID missions to get the best information money can buy.

Until recently, Freeman said, AID was not technically prepared to do environmental baseline studies, or to counsel governments on such things as high altitude forest management or desertification. "The fact is, many countries look for help in this area," but no one—including international agencies—is there with the answers. "None of the international agencies has done a very good job," he stated, charging "It's the worst case of criminal neglect in the history of international organizations."

AID turned to an agency with experience in resource management—the National Park Service—to educate AID personnel overseas and to help recipient governments carry out long-term natural resource management and conservation programs. The Park Service's three-stage approach will include:

• Review Papers—The Park Service will help amass "state-of-knowledge" reviews on how to survey natural resources and predict the ecological effects of their development, with regional projections of possible scarcities and damage to the environment. In this two-year project, the Park Service will look at how the U.S., the U.N. and international donor organizations like the World Bank determine "environmental baselines"—resource inventories—and how they pinpoint what is happening to those resources.

Another set of reviews will examine how laws, regulations and institutions manage resources and the environment. Study will

Environmental management...

ENVIRONMENTAL MANAGEMENT is becoming an increasing priority in Third World countries. More and more of them are asking development assistance institutions to concentrate funding and efforts on building just such a capability. To determine the extent of indigenous environmental training, the World Environment Center recently made a study of environmental management training projects in developing countries—at the request of the Ford Foundation. Using reports from WER correspondents and research done in the United States and Canada, the Center has put together the most comprehensive report to date on "Environmental Training in Developing Countries—A study of the practices of major national and international development financing agencies." The report concludes with a section on needs still not met and makes recommendations on how to fill the gaps. The 31-page report is available from The World Environment Center, 300 East 42nd Street, New York, N.Y. 10017, U.S.A., for \$5 (overseas orders \$1.25 extra).

FOLLOWING THE RELEASE of the Global 2000 Study by the United States, Japan's Prime Minister Zenko Suzuki has instructed the Director-General of the Environment Agency to form a private consultative panel to study worldwide environment problems by the year 2000. The panel of experts is to submit an interim report within this year.

INDIA's federal government has appointed a high-powered committee to oversee measures to save the historic Taj Mahal from the dangers of pollutants from the Mathura Oil Refinery, which is being built nearby.

Mrs. Gandhi's Cabinet wanted this committee to take the following measures: 1) the existing two coal-based power plants at Agra should be closed; 2) steps should be taken to shift existing small industries in Agra, particularly the foundries, so that their emissions do not affect the Taj; 3) no new industry which can cause pollution should be permitted in Agra; 4) the railways should switch from steam to diesel locomotives in the marshalling yards at Agra; 5) the federal Works and Housing Ministry should be entrusted with responsibility for dealing with pollution problems between Mathura and Agra; 6) at least three or four pollution-monitoring stations should be operational before commissioning the refinery; and 7) scientific studies should be undertaken to find out the effects of sulphur dioxide as well as oxides of nitrogen on marble and red sandstone. concentrate on Venezuela, the Sudan, Ghana and Malaysia to show how institutions have evolved in developing countries, and eventually move to "sector" analyses that will answer regional questions, such as how forestry problems are handled in Latin America, or how water is managed in the Nile region.

Finally, the Park Service plans to spend \$116,000 for a 15-month study of ecological problems in the tropics, to be prepared by a committee of the National Research Council and to draw on the Council's voluminous research on tropical moist forest development and protection.

• Case studies—The Park Service will take a long look at generic practices that pose special environmental dilemmas or offer solutions to perennial problems. For example, a joint U.S.-host country research team might chronicle the evolution of local native tropical agricultural methods, documenting successes, failures and solutions to guide future AID activity.

• Project design aids—For the final phase, the Park Service will plan how best to incorporate resource management and environmental concerns into AID development projects. Project types now being considered include irrigation, rainfed farming in differing climates, watershed management, rural roads and malaria control.

"A lot of money is becoming available from AID in resource management and environmental protection," notes Jeff Tschirley of the National Park Service. Existing AID environmental projects run from modest grants such as Tanzania's recently acquired \$40,000 for regional training of park and game wardens and resource managers to multi-million dollar efforts like Panama's watershed planning project. AID spent almost \$300 million during the past fiscal year on environment and natural resource activities.

CHRISTOPHER JOYCE

A big-money trade-off may lead to an ecological loss

PERTH—Four years ago the Australian government stopped an Australian-American joint venture company from mining sand on Fraser Island because it was causing environmental damage. Last year DM Minerals, a 50-50 partnership between the American Dillingham Corporation and the local Murphyores, went to the World Court demanding \$23 million in damages rather than the \$4 million the Australian government had offered in compensation. Recently, a proposed solution was hammered out between the two countries' Attorneys-General, Senator Peter Drew Durack of Australia and Benjamin Civiletti, in which the environment was seemingly ignored. If Australia allows Dillingham to resume sand mining on Fraser Island, the U.S. government will offer some concessions regarding anti-trust suits which the U.S. Westinghouse Corporation has lodged against several Australian companies (CRA, Pancontinental, Queensland Mines and Peko EZ), alleging trade practices aimed at putting up the price of uranium. A final decision is to come. IANE NACZYNSKI-PHILLIPS

The U.S. helps Kenya develop alternative energy programs

NAIROBI—The United States will help Kenya develop solar power installations for rural areas and will also cooperate in new energy programs emphasizing oil conservation.

The U.S. is providing \$4.8 million over the next four years to:

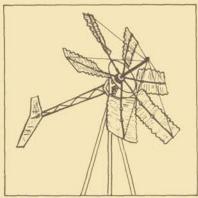
- stimulate and develop low-cost renewable energy techniques for poor people:
- support the development of renewable energy technologies to substitute for oil, wood or charcoal-based fuels;
- promote the expansion of forests and
- find ways to increase the efficient use of oil.

The U.S. Agency for International Development (AID) will provide a computer terminal and related software, plus training and technical assistance for Kenya's energy program—including the production of more efficient cookstoves for home use (WER, Feb. 23, p.5).

AID is also financing two photo-voltaic demonstration projects to convert solar power into electricity for rural health centers in two different areas. In Kitui District, the proposed unit will provide enough power for lighting and small electrical appliances; in Machakos District, it will also power an operating theater.

The aim is to show how the latest photo-voltaic equipment can meet the basic power needs in rural areas. The U.S. National Aeronautics and Space Administration (NASA) will design, develop, install and field test the equipment, and will train Kenyans to use and maintain it.

CHARLES HARRISON



Tanzania's village technology scheme is coming of age

ARUSHA—The Arusha Appropriate Technology Project (AATP) is gaining a national and international reputation for its innovative efforts to develop simple, low-cost devices required by Tanzania's rural poor.

AATP was started in 1977 by several young Americans who, based on their experiences with international aid agencies, felt traditional approaches to development work in villages had serious problems of technology transfer. AATP's founders aimed instead to design technologies which used readily available materials and could be maintained by the villagers themselves.

During its first two years, AATP established a demonstration site at which it produced and tested a variety of devices including solar water heaters, fuel efficient stoves, windmills for pumping water, wheelbarrows, ox carts and plows. The AATP staff worked on a

Energy sources...

ATLANTIC RICHFIELD (ARCO) has been recommended for an oil-gas exploration concession in eastern Greenland largely on its environmental record. A mixed Danish-Greenland delegation inspected ARCO's Alaskan installations at Prudhoe Bay and the shipping facilities at Valdez and came home with an official recommendation that the American oil company be permitted to help carry out a search for oil and gas in Jameson Land on the east Greenland coast. The Greenland home rule legislature is expected to grant its approval before the end of the year so that negotiations can begin with Nordisk Mineselskab, a Danish mining company in which ARCO holds a 30 percent share. Working out a concession and establishing ground rules for petroleum exploration in the sensitive east Greenland area will take about two years.

south Korea's first solar Power plant, set up by the Korea Solar Energy Research Institute (KSERI), recently went into operation. The generator, with a capacity of 4 kilowatts, provides electricity for 37 houses on Achado islet near Kanghwa Island in the West Sea.

KSERI now plans to establish solar generators with a total capacity of 90,000 kilowatts by the end of 1986 in locations where power lines are not available, a spokesman said.

CHINA HAS DEVELOPED a portable, low-cost solar cooker, weighing only 15 kilograms and costing less than \$20.

Using a bamboo framework and hundreds of small mirrors focusing on a centrally-placed cooking pot, the cooker provides temperatures higher than the conventional electric cooker.

Dr. Reynaldo Lesaca, deputy director of the UN Environment Program (UNEP) regional office in Bangkok, had the cooker demonstrated to him when he recently visited a school in Chengchow, in Hunan Province. He saw food prepared quickly and easily. Dr. Lesaca says several Chinese villages have already started using the cooker.

THE PHILIPPINE MINISTRY OF ENERGY has announced the official opening of the first geothermal plant in Negros Oriental Province. The three-megawatt power plant worth \$4.6 million will provide electricity to the whole of Dumaguate city and save 1.2 million barrels of oil. By 1982, a 112.5-megawatt plant will start operation at the southern Negros geothermal project in Palipinon-Dabin area in Negros Oriental. By 1985, the Philippines expects to have a capacity of more than 1,000 megawatts of electricity from geothermal energy.

Environment & Development . . .

IN EASTERN GUYANA preparatory work has begun on a massive \$40 million drainage and irrigation project. It will provide irrigation for 22,000 hectares of virgin land and improve the facilities for more than 12,500 hectares near the South American country's eastern border.

More than 30,000 farmers of rice, sugar cane, coconuts and other food crops will benefit from the project aimed at increasing Guyana's agricultural output both for the domestic and export markets.

The project is financed by the Government of Guyana, the Inter-American Development Bank and the International Development Association.

MAHARASHTRA is one of the largest states in India, and nearly three-quarters of its 60 million people depend on agriculture for their livelihood. But because rainfall is limited, crop yields are low. The state government has invested substantial amounts to develop its irrigation potential, but outdated planning, design and construction standards, and operational methods have limited the benefits.

The World Bank has come to the rescue through its International Development Association with a \$210 million interest-free loan over 50 years, nearly half the cost of the \$451 million, five-year project.

During that time, five major surface irrigation schemes will be constructed and two existing ones rehabilitated. There will be an increase of 11 dams, 900 kilometers of canals and about 620 kilometers of new or improved roads. The end result is expected to be year-round cropping, greatly increased yields of grains, cotton and sugarcane, and employment for more than 200,000 workers. It is expected that the percentage of farm families below the poverty line should shrink from 60 percent to 13 percent.

INDIA AND THE WORLD BANK are jointly funding the first integrated watershed development project—tackling both soil erosion and economic development—in the Himalayan submountainous zone of Punjab.

The \$60.8 million project covers five watersheds. Rehabilitation will be carried out in the upper catchments to control runoff and erosion; at the same time, flood control and irrigation will proceed in the lower catchments. Some of the existing wasteland will be reclaimed, and horticulture, livestock, poultry and fisheries development introduced.

pilot basis in three villages. About a year ago they added a Village Extension Program and now AATP is working in 25 villages in Arusha region.

AATP has moved from an emphasis on inventing gadgets at its demonstration site and then trying to "sell" villagers on them to doing extensive village surveys to determine local needs and priorities, then developing new technologies with the villagers and training craftspeople to make them.

AATP has discovered that these peoples' most pressing technical problems fall into four categories: water (both lack of and quality), housing, transport and cooking.

"We found, for instance, that people do not just want to improve traditional mud houses," extension program coordinator John Siceloff stated. "They want houses which look nice, will hold up and won't catch fire. Our big effort is to bring down the cost of good houses."

As Siceloff said, "When AATP first started, our original idea was the democratization of technology, the belief that everyone can make a new house, a better water system, etc. But we have found that unless people have a stake in it beyond their personal needs, they won't bother. Our emphasis has now shifted to creating cooperatives of craftspeople. They have a profit motive and an incentive to keep the project going. Now the villages decide on their needs and then look for capable villagers to respond to their needs."

In addition, AATP has found that low-cost technology is not crude technology. It must be made by skilled craftspeople. "We have discovered that the simpler and cheaper the technology, the more skill that's involved in the construction," said Siceloff. "As you're using the strengths and capacities of a material to the fullest, you must use the material well and carefully."

AATP's demonstration site, located in Arusha's industrial area under the shadow of Mt. Meru, can be spotted from a distance by its huge windmill turning above the surrounding buildings. There a steady stream of people—villagers, government officials and international visitors—see how the different devices are designed and used. Some inventions have proved more successful than others.

"We are trying to come up with a whole range of gadgets in different price ranges, some which institutions can afford, others which villagers can," explained Siceloff. For instance, based on village women's need to conserve cooking fuel, AATP has designed a variety of fuel efficient stoves. One, a solar cooker, is cheap and portable but, because it must be used outside and during daylight, has proved not very suitable. Several models of wood and charcoal burning stoves have been more successful. AATP's methane stove is relatively costly and takes a fair amount of animal manure so it is best suited for use by institutions rather than individual villagers.

Today AATP has a staff of five foreigners and 19 Tanzanians. By mid-1981 it will be turned over completely to Tanzanians. The project is part of Tanzania's Small Industry Development Organization and receives funding from a number of aid agencies, including USAID, OXFAM and the Swedish International Development Agency.

MARTHA HONEY

South Africa is revising and tightening its eco-controls

JOHANNESBURG—The South African government has revised and tightened its environmental controls.

In the past, environmental matters never really worried politicians and were not serious considerations even at election time. But over the last 10 years environmental pressure groups have begun criticizing the government's shortsighted planning.

There has been growing anger and concern even among government supporters over the government's piecemeal approach, a plethora of Acts that have been inadequately implemented or that were just plain inadequate. There has been little coordination and a fair amount of conflicting interests among departments. Recently, the government made three moves which reflect this growing concern.

1. Earlier in the year it scrapped the Department of Environmental Planning, and now all physical planning comes under the Prime Minister's Office. This is to enable a single powerful department to decide on priorities. Until now the building of big projects often depended on who got to the Treasury first before funds dried up.

2. In July, the government issued a White Paper announcing a new coordinated approach. The job of coordinating various environmental matters (ranging through pollution, waste management, wildlife management, noise, heritage buildings and areas, etc.) was to fall under the reinforced Department of Water Affairs, Forestry and Environmental Conservation.

The White Paper also called for environmental impact assessments on all large projects whether government, provincial or private. But it fell short of demanding that these be compulsory.

3. At the end of July the public was shown a draft of the Environmental Conservation Act, 1980, and invited to comment—a rare move in South Africa. The Act establishes a 30-man Council for the Environment to be appointed by the Department of Water Affairs, Forestry and Environmental Conservation's Minister Bram Raubenheimer. A third of the council will be Department men and the rest drawn from other authorities including the private sector "whom the Minister regards as environmental experts."

The council will advise the Minister and recommend new legislation. It can summon people to give evidence and fine those who refuse \$160. The council will establish committees for such areas as solid waste, the combatting of noise, and so on as necessary. The committees will review legislation in their fields on a continuing basis, and the council as a whole will coordinate their anti-pollution effects.

The Minister, after consultation with the council, is empowered to make regulations to control waste and various forms of pollution.

The Act makes the Department responsible for watching the effectiveness of radiation and pollution control, soil conservation, water pollution, marine pollution, waste disposal and littering.

IAMES CLARKE

Environmental legislation . . .

CAR-SHARING, a means of saving on the nation's fuel consumption and relieving road congestion, is to be made easier by provisions in the British Government's 1980 Transport Act.

Around nine million people in Britain either choose or are forced to drive alone in their cars to work. If only 2 percent organized themselves into a shared travel scheme, estimates the Department of Transport, 55 million liters of fuel and £30 million (\$72 million) in running costs could be saved annually.

The new provisions, which became law on October 6th, will not permit drivers to ply for hire like a taxi service but they will be able to advertise their willingness to carry passengers on a shared cost basis. This would include fuel, servicing and depreciation. Drivers will not be allowed to make profits or run businesses.

THE ENVIRONMENT AGENCY OF JAPAN has announced a set of standards to protect lakes and swamps from phosphate pollution. Lakes in Japan will be classified into five groups depending on the degree of required cleanliness.

Agency officials said that water in class I lakes should have a phosphate concentration of less than 0.005 milligram per liter, class II of less than 0.01 milligram, class III less than 0.03 milligram, class IV less than 0.05 milligram, and class V less than 0.1 milligram.

A NEW LAW aimed at reducing noise pollution in Hong Kong will be drafted soon for enactment by the Executive Council, official sources reported. Areas covered by the bill will include industry, neighborhoods, aircraft, building services equipment, railways and marine craft. Road traffic noise will be covered under a separate ordinance, the sources said. The draft bill is expected to be ready in six months.

IN JAPAN a unanimous vote by the Kawasaki municipal assembly in July defeated a resident-sponsored bill which would have banned the use of synthetic detergents in the industrial suburb 25 kilometers south of Tokyo.

Instead, it approved an assembly-sponsored bill to form a panel to study the product's safety and alleged pollution-causing effects.

The Kawasaki assembly followed neighboring Yokohama, Japan's second largest city with a population of 2.78 million, in rejecting a resident-sponsored bill of this sort, according to news reports.

Kawasaki has a population of 1.05 million and is a major electronics manufacturing center.

Water quality...

GREATER COPENHAGEN'S new \$200 million sewage treatment plant, which can handle 290,000 cubic meters of liquid wastes a day, should be completed about October 1, after roughly one year's delay. The Lynetten plant—so named after an old fort on the site—will carry out biological cleaning of sewage from a municipal area with over one million inhabitants, ending an old practice of sending these wastes out into the Oresund waterway with little or no treatment.

Oddly enough, construction of the plant posed an environmental problem. Work was delayed for months by workers' refusal to use epoxy as a coating for treatment tanks. Epoxy was finally used, but under strict surveillance of health authorities.

DELEGATIONS FROM EAST AND WEST Germany opened a series of negotiations in East Berlin recently to seek joint efforts to reduce serious pollution of rivers running between both states.

It was their first round of inter-government negotiations since the postponement of a planned summit between the two German leaders in August.

West German experts have pointed to East German potash mining as a major source of pollution of the border rivers.

The delegations have predicted that the talks will go on for several months.

THE UN ENVIRONMENT PROGRAM'S regional office in Bangkok will sponsor a UNEP-ASEAN workshop on environmental impact assessment for water resource development projects. The workshop has been proposed for February 16-20 next year, with a tentative venue at the Srinakarin dam in central Thailand. The Srinakarin is the country's newest dam.

SRI LANKA WILL SOON BEGIN a \$94 million water supply and sewerage project serving greater Colombo and adjacent urban areas. The project is expected to reduce serious health risks by improving the existing water supply and sewage collection systems. Financing will be shared about equally by the World Bank, the Saudi Fund for Development and the Government of Sri Lanka.

KOREA SOCIAL DEVELOPMENT Corporation researchers have warned that deteriorating river quality is posing a grave threat to Koreans—to the extent of endangering their source of drinking water. The researchers said that pollution in the country's four major rivers will double or even triple the permissible level of biochemical oxygen demand (bod) of 10 parts per million. The environmental experts also forecast that air pollution in Seoul will double or triple.

Clean water for all by 1990 is the next major UN effort

GENEVA—At its November 10 session in New York the U.N. General Assembly will launch the International Drinking Water Supply and Sanitation Decade—1981-1990.

Its goal is to provide safe water and sanitation to all people by 1990. The action follows a three-year preparatory phase during which the World Health Organization in cooperation with the World Bank carried out rapid assessments of the status of drinking water and excreta disposal in more than 100 countries. Measures needed to adjust national programs to the goals of the Decade and the difficulties that the countries are facing were also identified.

The effort and resources required to achieve clean water for all can be judged from a study reflecting the global situation in 1975: About 1.1 billion people, or 80 percent of the world's rural population, were found to have no reasonable access to a safe water supply. In urban areas about 22 percent—frequently the poorest—were similarly deprived.

The study found the sanitation situation to be even worse. An estimated 150 million people (25 percent) in urban areas were not served by any sanitary system whatsoever, while in rural areas 1.2 billion (85 percent) lacked sanitary facilities.

Seven UN organizations—UN, UNDP, UNICEF, ILO, FAO, World Bank and WHO—are working together closely to promote the Decade. WHO said that particular attention is being paid to improving coordination at the country level, and to establishing regular consultations among the governments, international organizations and the non-governmental organizations concerned. It said that UNDP Resident Representatives have been assigned a central role in coordinating the UN system's input to the national programs.

WILLIAM G. MAHONEY



A massive mystery fish kill hits the Caribbean area

PORT-AU-PRINCE—Millions of fish were found dead, or almost dead, this September, floating on the surface and washing up on Atlantic and Caribbean beaches surrounding the island of Hispaniola and the western shore of Jamaica.

Scientists from the Dominican Republic, Haiti, Jamaica, Puerto Rico, the Organization of American States, the United Nations and other agencies are trying to find out the cause. Andre Audant, a marine biologist consultant to Haiti's Ministry of Agriculture reported that most of the fish affected seemed to be bottom dwellers such as the red snapper, weighing between 2 and 15 kilograms.

While the source of the kill has not been officially determined, experts believe it must be an extremely powerful organic poison, possibly fluorophosphorus, usually used as an insecticide on land, Audant said.

However, sources in the Dominical Republic told WER that about ten 55 gallon steel drums of an insecticide of this type were blown into the sea from a commercial pier in Santo Domingo during Hurricane Allen. An official of the U.S. Agency for International Development, who heard this report, is said to have contacted the Dominical Republic Minister of Agriculture with an urgent warning that the drums must be located before they ruptured or rusted through. However, sources in the country said that no action was taken by authorities, and officials at the Ministry of Agriculture refused to confirm or deny the allegation.

Meanwhile, all countries in the affected area have issued warnings to their citizens not to eat fish or crustaceans from the contaminated waters.

ARTHUR B. CANDELL



Venezuela wants to develop the Orinoco for energy

CARACAS—South America is a major fresh water resource, for it has 60 percent of the world's rainfall, "yet," says the director of Venezuela's Environment Ministry, "its great rivers and their tributaries have contributed little to the socio-economic development of the region, and the majority of them might be classed as 'idle'."

To open up the interior for development, environment director German Uzcategui proposed to the IX Latin American Hydraulic Congress that an interior waterway be created by linking the Orinoco, Amazon and Parana Rivers.

Venezuela's Orinoco and its basin, for example, drain 85 percent of the nation's surface yet account for only 10 percent of Venezuela's economy. Between the towns of Puerto Ayacucho and Ciudad Bolivar the Orinoco has an estimated hydroelectric potential of 8,000 megawatts. In terms of equivalent petroleum energy this would represent 252,000 barrels a day, with a present value of \$3 billion annually. This hydroelectric energy is not only comparable in value to the undeveloped Orinoco Tar Sands area (with 500 billion barrels of recoverable heavy crude oil), but it is also cleaner and practically inexhaustible, environment officials observed.

Improved navigation on the Orinoco would result from the construction of power stations and would open up the entire area for development, from the delta to the foothills of the Andes, said the Environment Ministry. It would also help decongest coastal centers.

HILARY BRANCH

Toxics...

KOMMUNEKEMI, DENMARK'S PIONEERING PLANT for handling the entire country's chemical wastes, fears a threat to its operations in local authorities' approval of a Copenhagen paint company's project to burn its own wastes. Kommunekemi's administration fears the approval may set a precedent.

Kommunekemi, which is owned by the Association of Municipal Bodies, burns or otherwise disposes of all liquid and solid chemical wastes that can't be reprocessed by industry. The plant, located at Nyborg in central Denmark, hasn't gone into the recycling business, largely because it's not yet an economical matter. Kommunekemi gets its income by charging industry for transporting wastes to the Nyborg plant and by selling heat to the local district heating system. The paint company that has won a goahead for its own waste-handling plans says it costs too much to send the wastes to Kommunekemi and it can use the wastes for its own heating purposes.

IN JAPAN, a liaison council, organized by the Ministry of International Trade and Industry (MITI), the Health and Welfare Ministry, the Foreign Ministry, the Meteorological Agency and the Environment Agency has decided to curb the discharge of chlorofluorocarbons into the atmosphere. The council is still deciding the extent of the restrictions. Chlorofluorocarbons are used in aerosol containers and as cooling agents in refrigerators and air-conditioners. Their accumulation in the atmosphere is destroying the ozone layer that protects the earth from harmful ultraviolet rays. A one percent loss of ozone could cause a 4 percent increase in the incidence of skin cancer. After the decision of the liaison council, MITI asked the industries concerned to substitute other gases in air spray products.

"PUBLIC POLICY FOR CHEMICALS: National and International Issues" provides an overview of the problems involved in the notification, testing and control of toxic chemicals. It has been designed as a primer to assist businessmen, legislators and interested individuals in understanding global as well as national aspects of chemical control issues. Chapters emphasize developments in chemical control in the U.S. and Europe, dealing briefly with similar trends in other countries such as Japan. It suggests alternatives available to the chemical control policy-maker and the processes by which choices are made. The 152-page book is published by The Conservation Foundation, 1717 Massachusetts Avenue, N.W., Washington, D.C. 20036, U.S.A. It sells for \$8.95.

Briefly ...

THE U.S. IS HOLDING onto \$5 million of its \$10 million 1980 contribution to the UN Environment Program because UNEP bowed to Arab and African pressure and did not award the contract for its new facilities in Nairobi to the lowest bidder, an Israeli firm, Said a U.S. State Department spokesman, "Our concern never has been that the contract be awarded to any particular contractor or any particular country. Our concern is that the UN's own contracting procedures should be observed in letter and spirit." UNEP will soon make a full report on the contracting controversy to the General Assembly and, said the U.S. spokesman, "until we get a chance to read that report, we are not in a position to say whether the procedures were lived up to." However, since the U.S. is UNEP's biggest funder and, he said, "because of the importance we attach to UNEP for attacking environmental problems," it is unlikely that the money will be withheld after UNEP's executive director Tolba makes his report.

ATMOSPHERIC RESEARCH plays a vital role in the environmental sciences. In 1977 the U.S. National Research Council (NRC) initiated a broad review of what had been done in the field, where current research was headed, and what research objectives should be in the coming decade. The NRC appointed a Committee on Atmospheric Sciences to formulate national objectives in this field during the 1980s. This Committee has produced a book on its findings suggesting that national efforts focus on climate, atmospheric chemistry, small-scale and severe storm-research. Its findings may be of interest to other governments as well. "The Atmospheric Sciences: National Objectives for the 1980s" is available from the Committee on Atmospheric Sciences, National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C. 20418. 130 pages.

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The megalopolis of 2000 needs balanced planning now



ROME—By the end of the century over half of the world population will be urban, a situation unprecedented in human history.

The number of super-cities of more than five million, now 26, is expected to become 60 by the year 2000 and three-quarters of them will be in the developing world. Mexico City could lead the list with 31 million inhabitants, followed by Sao Paulo do Brazil with 25.8 and by Tokyo-Yokohama with 24.2. New York, which now ranks as the world's largest metropolitan area with a population of 20.4 million, would barely lead Shanghai by 100,000 people; it will have 22.8 million inhabitants spread over the city and northeastern New Jersey. Peking could have 19.9 million citizens, followed closely by Rio de Janeiro, Bombay, Calcutta, Jakarta, Seoul and Los Angeles-Long Beach, Cairo-Giza-Imbaba and Madras, Manila and Buenos Aires.

This awesome perspective of the urban explosion in the next millennium was scrutinized by mayors and urban planners from all over the world, assembled here recently by the UN Fund for Population Activities. The participants of the International Conference on Population and Urban Future considered the problems generated by rapid urbanization: housing, jobs, pure water and clean air, sanitation, mass transport, health services, education, and recreational activities.

The final document of the conference, termed The Declaration of Rome, warns that unplanned urbanization may generate tension between groups and classes within the city itself and it may generate tension between urban and rural areas. "Peace, which is the precondition for development, may be put in jeopardy as one of the principal threats to peace is the social unrest caused by the accumulation of human fear and hopelessness," the declaration stated.

The Rome Declaration directs an appeal to countries which do not yet have comprehensive population policies and programs to formulate them by 1985, with particular emphasis on health, education, housing, nutrition, employment and environmental conditions.

But above all, plans for the redistribution of population, the Rome Declaration warns, will succeed only if they form part of a strategy of balanced development. To reduce the flow of migration from the countryside to the cities, it is necessary to eliminate glaring disparities in the quality of life between urban and rural areas.

VITTORIO PESCIALLO

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For the sake of argument: A triage strategy for species

NAIROBI—The problem of disappearing species is becoming increasingly acute. Of earth's 5-10 million species, only 1.6 million have been identified by science, and a far smaller number has been assessed for their survival prospects. If we consider all species on earth and the rate at which natural environments are being disrupted if not destroyed, it is not unrealistic to suppose that we are losing at least one species a day. By the end of the 1980s, we could be losing one species an hour.

It is becoming plain that we cannot assist all species that face extinction within the foreseeable future. Conservationists have limited resources at their disposal—finance, scientific backup, etc. Even were these resources to be increased several times over, we could not hope to save more than a small proportion of all species that appear doomed to disappear. The processes of habitat disruption are too strongly underway to be halted in short order.

When we allocate funds to safeguard one species, we automatically deny those funds to other species. This means that we effectively assign priority to certain species in preference to others. We choose unwittingly rather than deliberately. But we choose.

Hitherto conservationists have tended to support those species that receive most attention. As a result, they have focused on species known to science, known to be threatened, and generally which offer some measure of public appeal. By contrast, species with a less glamorous image have received far less attention; and species that are yet to be recognized by science and hence remain uncategorized have received virtually no attention. Included in these latter categories are the great majority of invertebrates, which, together with certain other uncharismatic groups, comprise at least 80 percent of all species.

Today, we support only a mere fraction of all species in trouble. Before long we may find that we can assist a still smaller proportion of all species facing extinction. Thus a key challenge for conservationists lies in the most efficient way to allocate funds for species-saving programs.

We may already have reached the stage where there is merit in determining which species are "most deserving" of a place on our planet. Agonizing as it will be to make choices among these lines, a conservation strategy needs to be made as systematically selective as possible. In other words, the previous approach needs to be complemented by a broader, more methodical approach that seeks to determine, for example, which groups of species are

Wildlife...

THE WORLD WILDLIFE FUND (WWF) recently announced that Japan will become the 60th member of the Convention on International Trade in Endangered Species. Since Japan is now playing an important role in the international trade in many animal and plant products, the country's acceptance of the convention would help in the conservation of many endangered species, a WWF spokesman said.

A CONFERENCE ON THE ELEPHANTS of Southeast Asia was held in Sri Lanka recently. An "action plan" for their conservation was discussed along with a proposal to set up an Asian Elephant Secretariat in Sri Lanka.

The conference, sponsored by the International Union for the Conservation of Nature and Natural Resources, was attended by elephant experts from Bangladesh, India, Indonesia, Malaysia, Sri Lanka, Thailand and Nepal. Burma was not represented but has submitted a report about the elephant situation there. The elephant population in Asia is estimated at 40,000 ranging from 30 in Nepal to about 15,000 in India, conference sources said.

THE WILD ANIMALS PROTECTION Bill prohibiting hunting in Hong Kong was recently passed by the Legislative Council, to be implemented beginning January 1. However, according to a government spokesman, specific hunting could still be permitted under a section of the principal ordinance.

LAKE HORNBORGA in southwestern Sweden—once a birdwatcher's paradise—is to be restored. "This is absolutely the biggest single environmental project undertaken in this country," commented Valfrid Paulsson, director general of the state's National Environmental Protection Agency. The restoration will cost an estimated 50 million crowns (\$12 million) and require 15 years to complete.

A century ago, the lake was two meters deep and had 30 square kilometers of open water. To gain arable land, the lake's water level was lowered several times with the result that it became grown over and now is mainly marsh. Fish and bird life steadily disappeared.

Ten square kilometers of the lake's northeastern area are to be cleared of reeds and a 25-kilometer-long protective embankment built around parts of the shoreline and feeder streams to prevent flooding. Thereafter, the water level is to be raised 1½ meters in two stages with an eight year interval to permit nature to build a new shore line.

unusually vulnerable to summary extinction, which groups make outstanding contributions to ecosystem stability, which groups are of significant economic value to humankind, and so forth—and which groups are, willy-nilly, less "worthy" and so less likely to qualify for limited conservation measures. In short, we need to devise an analytic methodology that supplies us with an evaluatory ranking of priority among species.







Triage strategy

In essence, this approach amounts to a "triage strategy" for species. The term derives from French medical practice in World War I, when battlefield doctors found there were more wounded than they could handle. So they assigned each soldier to one of three categories: those who could certainly be helped by medical attention; those who could probably survive without attention; and those who appeared likely to die no matter how much attention they received. The first category absorbed pretty well all medical services available, so the other two categories were ignored.

If a strategy along similar lines were applied to threatened species, it would amount to a more rational approach than that practiced so far. It would be systematic rather than haphazard, and it would enable conservationists to make optimal use of their finances and skills.

How would choices be made? How could we decide between the Bengal tiger and a crab in the Caribbean? Should we focus on remnant patches of rainforest in countries that have experienced decades of destruction, or should we try to "lock away" vast tracts of forest in regions that have been little touched? These, among many others, will be decisions that are difficult to make.

A start could be made through systematic analysis of factors that make some species more susceptible to extinction than others—for example, sensitivity to habitat disruption and poor reproductive capacity. In addition to bio-ecological factors, there is need to consider economic, political, legal and sociocultural aspects of the problem. The Bengal tiger requires large amounts of living space in a part of the world that is crowded with human beings, but it could stimulate more public support for conservation of its ecosystem (and thereby help save many other species than could the less-than-charismatic crab. When we integrate all the various factors that tell for and against a species, we shall have a clearer idea of where we can best apply our conservation muscle.

Many tough decisions will have to be made. Nobody will like the challenge of deliberately consigning species to oblivion. But insofar as man is already doing so unintentionally, he might as well do it with as much selective discretion as he can muster and determine the future of species by design rather than by default.

DR. NORMAN MYERS

Eskimos from three countries meet to save their homeland

NEW YORK—The Inuit, or Eskimo people, of Canada, the U.S. and Greenland gathered in Nuuk, Greenland, this summer for their second-ever conference. They drew up a charter recognizing that "the Inuit homeland and its resources are of critical importance to the international community" and that "international and national policies and practices should give due consideration to protection of the arctic and sub-arctic environment and to the preservation and evolution of Inuit culture and societies." And they vowed "to promote wise management and use of non-renewable resources."

Most of the resolutions their General Assembly adopted were environmental: on offshore drilling for oil and gas; the transport of oil; coastal zone management; scientific research on the marine environment; whaling; shrimp fishing; living resources regulation; integrated resource development; banning nuclear exploration, testing and disposal; environmental impact assessment and on depletion of renewable resources.

Their goal is to be recognized as one people, transcending political boundaries, including those of Siberia, so that they have a say in the policies and activities affecting their homeland.

LIBBY BASSETT

World Wilderness Congress culminates in conflict

PERTH—Conflict has developed, particularly in Australia itself, over the content and staging of the Second World Wilderness Congress held recently in Cairns, Queensland.

The congress, organized over a two-year period following the first such conference in Johannesburg, South Africa, has been widely criticized by delegates and the press here as little more than a public relations exercise for Queensland tourism and the mining companies who were its major sponsors. About 40 speakers were invited to the \$250,000 five-day meeting.

Protesting that no Aboriginal groups had been invited to the congress and that the meeting was pro-mining, a counter-congress was set up nearby and an Aboriginal group staged a demonstration outside the congress meeting place. In a protest at the lack of Aboriginal involvement in national park management, one speaker said: "We owe it to ourselves to be educated by the Aboriginals, because they kept this country for 40,000 years and we are denigrating it in 200 years."

Congress Executive Director Alan Lennon told WER that, despite the publicity, the official congress and counter-congress were not at loggerheads. "It was not intended to be an Aboriginal land rights forum, or a cattlemen's forum, or any other kind," he said. Nevertheless, of 18 resolutions passed at the congress dealing with wilderness issues, six involved Aboriginals' relationship to their native land.

Plans are underway now for the Third World Wilderness Congress which may be staged in either the Philippines or Brazil.

JANE NACZYNSKI-PHILLIPS

Education ...

"HUMAN SETTLEMENTS IN THE ARCTIC" provides a review of experience from eight Arctic countries over the last 20 years in the planning and development of their communities. Separate chapters consider the objectives of northern community development, the difficulties involved in providing infrastructure comparable with that in more southerly latitudes and the particular difficulties associated with construction of housing and other buildings in the north. The 122-page book is based on the proceedings and conclusions of a 1978 UN seminar on the Arctic. It is published by Pergamon Press and sells for \$22.

MORE THAN 10,000 PEOPLE—top executives in industry, government experts and other decision-makers—from 30 countries have been trained over the last three years under an environmental education project carried out in Geneva, Switzerland.

It is jointly sponsored by the Swedish and Danish international development agencies, and by the UN Environment Program (UNEP).

About 200 seminars and workshops have been held at the Center for Education in International Management in Geneva. National industrial organizations and various regional environmental educational institutions helped set up the courses.

A workshop to evaluate the program, held at UNEP HQ in Nairobi, was attended by experts from Switzerland. Italy, East Germany, Senegal and Canada, and by a UNEP team headed by its Environmental Education and Training head, Victor Johnson. The Nairobi meeting recommended strengthening environmental research institutions in developing countries. They also agreed that relevant educational materials should be related closely to the needs of different regions.

VENEZUELA'S SCHOOLS will teach environmental education. A joint program of the Ministries of Education and Environment aims at initially reaching 35 percent of Venezuelan pupils, at least 630,000 students. The director of environmental education in the Environment Ministry. Rodolfo Hernandez Grillet, said his staff is working with Ministry of Education experts on the reformulation of studies to include ecology and conservation.

Plans call for 1,260 teachers to be trained in 42 special courses in order to serve as instructors.

The Environment Ministry also signed an agreement with the Agrarian Training Institute to instruct 30,000 farmers in conservation problems.

Down under ...

ADELAIDE is already one of Australia's loveliest city centers with the Torrens River just a short walk from the downtown business district.

Now the state of South Australia has proposed a \$23 million facelifting scheme. Over 14 years the river would be converted into a 30 kilometerlong greenbelt through the city and suburbs, linking the Adelaide Hills to the sea.

The proposal, five years in the making, provides for two golf courses, an equestrian park, a wildlife sanctuary and reserves for sports activities, all linked by bush trails and cycle tracks.

DESPITE FEDERAL OPPOSITION, state legislators in New South Wales (where Sydney's pollution ranks high on the international blacklist) announced their intention to introduce lead-free gasoline at all retail outlets.

Australia's federal government opposes the introduction of lead-free gasoline, which reduces the yield of gasoline per barrel of oil, because of the added cost to consumers and because it comes at a point when conservation of domestic supplies is a prime objective at the federal level.

Incidentally, at about the time the announcement was made, the Sydney City Council announced that the city's ozone reading was five times above World Health Organization recommended levels.

THE KEEP AUSTRALIA BEAUTIFUL Council of Western Australia has asked local packaging industries to donate one percent of their costs to an anti-litter campaign. The levy is supported by the larger soft-drink, milk, fast-food, confectionery and ice cream manufacturers.

The levy ties in with those products that could become litter or whose packaging could become litter. The money will be spent on public education and litter-abatement programs in Western Australia.

THE PESTY FRUIT FLY, which causes untold damage to Australian orchards, is about to have its procreation activities curtailed—by breeding more of the insects.

In Western Australia, some 10 million fruit flies specially bred for the task will be released each week from August to March. But the laboratory insects, all males, have been sterilized. The Department of Agriculture is hoping the sterile insects, still sexually active, will swamp the fertile fly population, resulting in the death rate of the flies surpassing the birth rate and, eventually, eradication.

This program follows a pilot project initiated last year when four million sterile flies were released.

The new breed will be released around Carnarvon, 980 kilometers north of Perth and an ideal area because of its isolation from other fruit fly areas.

Tasmania saves a wilderness by modifying a power scheme

PERTH—Two river valleys in a wilderness area of Tasmania, Australia's island state, have been saved from flooding. The idea was to build a dam that would provide 180 megawatts of power—and employment. But the scheme met a flood of protests from conservationists and led to a four-day debate in the state capital, Hobart, first by the Cabinet and then by a caucus of the whole Labor party.

A compromise scheme was voted in, building the dam further upstream on one river, the Gordon, and turning the other river, the Franklin, and its catchment area into a national park.

Although seen as a victory, the score is really 1 to 1. Stage one of Gordon River Power Development began in 1967 and caused a decade of controversy before it officially opened last year. This scheme involved flooding Lake Pedder National Park. Full opposition to the plan did not gather force until it was discovered during construction that the area contained rare animal and plant species.

The public awareness that this caused led the Hydro Electric Commission (HEC), which had kept stage one activities under wraps, to begin publicizing its proposal for stage two as early as 1976. It was this which led to the compromise agreement, and the HEC will now look for other rivers to develop outside the remote southwest, which is a favorite haunt of bushwalkers, conservationists and artists.

JANE NACZYNSKI-PHILLIPS

New Zealand looks for health problems from Agent Orange

WELLINGTON—New Zealand's Vietnam veterans are joining with their fellows in other countries in questioning the link between health problems and Agent Orange, a defoliant used in the war that is suspected of causing birth defects. One component of Agent Orange, the herbicide 2,4,5,-T is still widely used in spraying crops.

The National Health Statistics Center is collecting data on the majority of birth defects through the country. Information on the number, and rates, of 11 sorts of congenital anomalies goes out monthly from the center to be evaluated. If clusterings of anomalies occur, these are drawn to the attention of the Director of Public Health.

The Agricultural Chemical Board hs set up an independent advisory committee on pesticide hazards. The Health Department is studying workers at a chemical manufacturing plant at New Plymouth which produces 2,4,5-T. And a clinical school in Wellington is studying the health of agricultural spraying operators and their families.

Meanwhile, Joan Brooks, investigating officer at the Commission for the Environment, believes there is a wider ethical issue raised by crop spraying. She asks whether anyone, or their property, should be unwittingly or unwillingly sprayed by "any mixture of chemicals, no matter what they are." JOHN KELLEHER

Red tape and political sloth slow Italy's eco-protection

MILAN—Stringent pollution control laws are not in place four years after major environmental disasters struck northern Italy—the dioxin pollution which led to the evacuation of Seveso and an oil leakage into Lake Como. An official of the Ecologic Council of the Lombardy region agrees, without blushing, that "we are well behind all industrialized countries in this sector."

The official, engineer Carlo Di Silio, says "red tape and little political interest" are the main reasons for slow enforcement of the so-called Merli law (named for its sponsor), which was approved by the parliament in 1976. It grants power and funds to regional authorities for anti-pollution measures.

Even though significant results have been achieved nationwide against air pollution, water pollution and the treatment of city and industrial wastes are unresolved problems, say environmental officials of the Lombardy and Piedmont regions—the most industrialized in Italy and the most advanced, comparatively, in antipollution efforts.

Nearly 6,000 companies in Lombardy and about the same number in Piedmont have applied for special state financing to install waste treatment facilities by the end of this year. However, approval of these projects and the allocation of 350 billion lire (\$420 million) by the government is not expected by then, which will make it two years later than originally scheduled.

Treatment of city wastes, for which 2 trillion lire (\$2.4 billion) was to be invested within the next two years, is also running late in many regions due to lack of technicians and infrastructure. Although jail terms ranging from two months to two years and fines of from 500,000 to 10 million lire (\$600 to \$12,000) can be imposed as penalties for pollution, in the absence of controls and because of delayed enforcement of the laws, illegal dumping of industrial wastes still is common.

The Seveso case, following a massive leakage of the highly toxic chemical dioxin in a densely populated area, triggered calls for a closer cooperation between land offices and authorities on air and water pollution and on industrial planning.

According to experts, Italy was not prepared to face the environmental crisis which followed the years of heavy industrialization. Many oil refineries and other potentially hazardous industries sprouted along Italy's coasts and rivers in the '50s and '60s without the inherent environmental problems being considered.

"Now we are trying to recover the time lost," said a regional official. "We are behind, many years late, in comparison with industrialized countries. However, specialized personnel in the Lombardy ecology division have climbed from zero in 1971 to 90 this year and are going to reach as high as 130 by 1981. This is a first and essential step for strengthening public structures, needed for the solution of growing environmental problems."

PIERO VALSECCHI

In Europe...

DON'T LOOK FOR MUCH MILITANCY from Danish environmentalists. Only a minority of delegates representing various environmental groups at a recent conference came out in favor of joint political action to elect members to municipal and county bodies. The prevailing view appeared to be that heterogeneity provides strength, because it keeps the politicians guessing.

The conference, held at the Askov Peoples High School, produced agreement on the exchange of information and a decision to make the gathering an annual affair. In all, about one hundred environmental group representatives took part.

THE PEOPLE OF FINLAND have responded enthusiastically to an initiative by local nongovernment organizations to make 1980 a year of Environment Protection.

Each quarter, special attention has been directed to a different major issue—conservation of nature, protection of the human environment, energy, and non-renewable resources—with conferences, seminars and other campaigns attracting wide public support.

Supporting the campaign, the Finnish Government's Ministry of the Interior has launched an environmental education project. One of its objectives is to double research on environmental issues in Finland by 1985.

IN PORTUGAL, groups are sprouting up all over the country to defend the environment. In the north, villagers fed up with the filth seeping into their houses from an asphalt factory simply blocked the entrance to the industrial unit with rocks. The villagers have been picketing for over a month and intend to let workers and administration start up again only after antipollution devices have been installed. In the center of Portugal, thousands protested in front of a huge petrochemical complex demanding that local officials be consulted before the villages in the area are polluted beyond repair. In other areas, local representatives are forming groups to dredge rivers, clean beaches and draw attention to projects that could eventually damage the environment.

ONE OF SWEDEN'S SIMMERING environmental questions, whether to exploit what is claimed to be Europe's largest remaining reserve of uranium ore, recently was laid to rest.

The boards of Ranstad Slate company and the Swedish Alum Slate Extraction company, which owned the rights to the Ranstad area in southern Sweden, announced they would not quarry the uranium-rich slate because it would no longer pay in view of the declining price of uranium on the world market.

In Latin America ...

BRAZIL HAS A SURPLUS of alcohol for automobile fuel production and, according to the Ministry of Industry and Commerce, should be exporting \$200 million worth of alcohol this year. The current selling price has been pegged at \$62 a barrel and the major purchasers are expected to be the United States and Japan—with minor sales to several European countries.

This situation, however, will not last, says the ministry, and sales will cease as soon as domestic demand catches up with supply.

The surplus is mainly due to a long auto workers strike in Sao Paulo which has caused the production of alcohol-burning cars to fall well short of targets. Alcohol production, however, has kept pace with government goals.

AS FORESTS in Central and South America and the Caribbean are cut down, ornithologists in North America are noting a corresponding decrease in the number of migratory songbirds that fly north each spring.

Studies published by the Smithsonian Institution show also that recent changing land-use patterns—using one-time forest land for agriculture or industry—have forced the songbirds to find new breeding and foraging areas. Scientists feel this may affect the birds' health and reproduction.

THE CHILEAN GOVERNMENT should seriously look into two natural resources which could be exploited for alternative energy sources, says one of the nation's leading scientists, Dr. Igor Saavedra of the University of Chile.

"Chile has the greatest wind potential in the world," said Saavedra in a recent speech, and the wave potential of the northern coastal waters should also be more fully utilized. Chile has some 5000 kilometers of Pacific coast and is studying alternatives to escape its dependence on imported oil.

COLOMBIA'S MINISTRY OF AGRICULTURE is completing an ecological study and a hydrodynamic model of the Bay of Cartagena to reduce pollution of the coastal waterway. Cosponsored by the University of Miami and the Colombian Convention of Oceanography, the project will aid municipal authorities in controlling industrial waste entering the bay from a man-made canal near petrochemical and oil installations.

The ministry also has asked the Food & Agriculture Organization to send a team of Swedish experts to Cartagena to revise government proposals for pollution controls at a bayside soda plant. The plant, one of the largest in the country, was closed after it was found to be dumping large quantities of mercury into the bay of Colombia's most popular tourist resort.

Venezuela is multiplying its conservation efforts

CARACAS—Venezuela's Environment Ministry has intensified its efforts recently. For example:

- A study on "Venezuelan macro-environmental systems" was undertaken with the cooperation of UN agencies and foundations such as Bariloche of Argentina and Oficel of Colombia.
- A conservation declaration was signed by all major political parties as well as representatives of private communications media, labor unions and company associations for cooperation in environmental protection and conveying conservation messages.
- Contacts were made with the French Environment Minsitry to establish a cooperative program through Jean Chapon, who visited the Venezuelan environment minister Carlos Febres Pobeda. Not unsurprisingly, he announced that several French companies are interested in contracts for pollution control and ecological defense.
- A permanent commission involving the Environment Ministry and Caracas' town council was set up to expedite the organization of now-frequent community actions, such as cleanup operations, tree-planting and protection of green zones. The joint commission would serve as a model for similar bodies throughout the country.
- An inventory was begun of the large reserves recently declared National Parks to make them available for public recreation. "We reject the contemplative meaning of national parks because we consider they are for the enjoyment of all, within rational use," said environment chief Febres.
- Courses were offered to teachers in the uses of parks and green zones as open classrooms.
- Billboards were outlawed from green zones around Caracas, except for those with conservation messages.
- And, an agreement was made with Catholic Church authorities in Tachira State for the transmission of conservation messages on church radio programs.

A Colombian town unites against a chemical plant

BOGOTA—The people of Caloto are threatening to throw out their municipal council because it approved a sulphuric acid plant in this agricultural and fishing town in southwestern Colombia.

Oppositon centers on company plans to construct a 30-meter-high chimney which the Calotenos claim will shower 312 kilograms of sulphur dioxide every day on the surrounding country-side. "Maybe we don't know anything about chemicals," remarked an elderly peasant, "but when we want to frighten the birds away from the tomato patch, all we have do is burn a piece of sulphur and the animals never come back. That's what the plant is going to do—burns tons of sulphur."

Local inhabitants also object to the plant's intended use of a nearby river for dumping chemical residues as the river is a source of livelihood for local fishermen.

The proposed plant is part of a chain owned by Quin (Quimica Basica Colombiana S.A. y Compancol), and was to replace a similar installation in the nearby city of Cali. The Cali plant was closed by the government in November, 1977, following a long battle between the company and civic authorities. Studies showed that not only was the plant responsible for severe air pollution, but that 50 percent of Quin's labor force in Cali suffered health problems as a result of their work.

Quin and the Caloto municipal council did not count on local opposition to the project, which has united all economic classes and political persuasions. Nor has Quin been able to persuade the people of the employment opportunities offered by the \$7 million plant, as there will be only 85 jobs for a population of 80,000.

The company claims that "those Negro brutes" in Caloto are misinformed and that the plant will not contaminate air or water. The local people responded by threatening to oust their municipal councilmen. And representatives of eight neighboring towns have joined the protest movement.

Words such as "ecology" and "sulphuric acid" are now often heard in public discussions on the bus and in the marketplace. Argemiro Mina, the local schoolteacher and a protest leader, has even written an ecological primer to teach his students to read.

Caloto is an historical site that once was the home of the South American liberator Simon Bolivar. It is also known for a miraculous statue of the child Mary, drawing pilgrims from distant parts of Columbia, which now is being called upon "to make the company go away."

PENNY LERNOUX

Chile says regulating coalfired plants is unnecessary

SANTIAGO—As Chile begins to use more coal to fire its thermoelectric generating plants, no plans are being made by the nation's officials to control emissions from the plants.

No environmental controls are now in practice and none are planned for the future because they are not needed, said the national electricity company's (Endesa) director of development, Rudolf Rihm Rihm.

Though Chile obtains most of its energy from hydroelectricity, thermoelectric plants are now located in three separate areas, with two units at each location and several more planned.

Endesa official Rihm said this will not create environmental problems since the plants utilizing the coal are located on the coast in desert regions, not near enough major population centers to affect health or air pollution standards.

Chile has no ministry or overall environmental protection agency to deal with the problem of air pollution from plants to be built in the future, though there are some small and largely powerless governmental entities that deal with environmental controls, primarily in Santiago where air pollution is considered a threat.

JOHN ENDERS

Environmental health...

HUMAN VIRUSES in water, wastewater and soil, as well as in fish and seafood, constitute a public health problem of real significance, says the World Health Organization.

More than 100 different virus types are known to be excreted by humans, and WHO says that enteroviruses, for example, can persist for long periods of time in the environment—for up to five months in tap water, seawater and soil; two to three months in oysters, etc.

And their studies have shown that viruses can easily survive present sewage treatment methods

Through its Environmental Health Program, WHO has been studying water pollution control in developing countries, the re-use of effluents, disposal of community wastewater, and the public health problems of viral contamination of food nourished by these waters.

THE ENTIRE POPULATION of a village called Chanora near Baroda town in the western Indian state of Gujarat is to be shifted to another site, partly because of excessive pollution caused by emissions from the nearby state-owned petrochemical complex and the Gujarat oil refinery.

The Indian Petro-Chemicals Limited is one of the biggest complexes of its kind in the world and has been responsible for boosting Baroda as a major industrial center in the country. Its management will finance the relocation of villagers.

A RECENT SURVEY by the Christian Industrial Council in Hong Kong says that industrial pollution in Kuntong has reached alarming proportions. Kuntong is the largest urban industrial area in Hong Kong with 5,200 factories and a population of 620,000. The survey found that the majority of workers suffer from respiratory difficulties and chronic bronchial and trachea ailments.

Workers interviewed put forward the following recommendations: tougher penalties for offenders; the removal of toxic and polluting industries from urban areas; the setting up of more parks, the establishment of an independent body, consisting of trade unions, health experts and employers, to monitor industrial pollution; and an independent department in the government to deal with pollution complaints and inferior factory machinery. The results of the survey and the suggestions of the workers will be submitted to the government departments concerned.

Renewable energy...

RENEWABLE ENERGY sources can raise environmental problems, which must not be overlooked as the world turns increasingly to alternative energy. This is the message in a 132-page report drawn up by the UN Environment Program, the third in a UNEP series that follows earlier documents on nuclear and fossil fuels.

Compiled by Dr. Essam el-Hannawi, chairman of UNEP's energy task force, on the basis of contributions by many experts, the report notes that although knowledge of the environmental impacts of geothermal energy and hydropower is more advanced that that of other renewable energy sources, little is known of the health impacts or the quantitative environmental impacts of these sources.

The report sets out details of present information relating to geothermal energy, solar energy, wind energy, wave energy, hydropower, biomass, biogas and alcohol production from vegetable matter.

Copies of the report and related information can be obtained from Dr. Essam el-Hinnawi, Chairman, Energy Task Force, UNEP, P.O. Box 30552, Nairobi, Kenya.

IN 1969, INDIA'S GUJARAT STATE launched a community forestry program to increase the supply of fuelwood and other forest products. Even so, forests cover only about 10 percent of the state's area, and shortages of wood are severe.

To increase the amount of fuelwood and other forest products and, particularly, to offer paid employment to the poorest Gujaratis and thus stabilize their environment, the government and the World Bank are financing a \$76 million, five-year community forest project. It will train foresters, provide housing and equipment, establish about 105,000 hectares of forest plantations, expand state tree nurseries, and promote fuelwood conservation.

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The President of Mexico proposes a world energy plan

MEXICO CITY—Calling Mexico "the border between the world of poverty and the world of wealth," Mexican President Jose Lopez Portillo strongly urged adoption of a world energy plan as a means to world peace. The plea, along with comments on his country's environmental problems and progress, came in his fourth annual State of the Nation address. Two years remain in his presidential term.

Mexico's world energy plan is "based on the premise that energy supplies are the joint responsibility of the world community," he said. They should be used to insure "an orderly, progressive, unified and just transition between two ages of mankind and between two world energy structures: The present, based on the often excessive, wasteful and unbalanced use of the most rapidly exhaustible fossil fuels, particularly oil, and the future, based on rational, orderly and progressive use of alternative energy sources...."

President Lopez Portillo pointed out that an agreement by Mexico and Venezuela to supply the oil needs of Central American and Caribbean countries at low prices and long-term, low-interest credit was "a partial and temporary expression of the world energy plan we proposed.... We believe that this effort toward congruent action should, by its example, encourage similar actions by other nations, not only in relation to petroleum but in all fields of progress, mutual respect and international social justice."

Success is being achieved in a key part of the national demographic plan, he said. The birth rate, around 3.6 percent when Lopez Portillo began his term, is now down to 2.9 percent and may be lowered to 2.5 percent by the time his term ends in 1982, he predicted. The other major thrust of the demographic plan is reversal of the process of population concentrations around Mexico City and in other large cities by channeling it to other regions.

The overall purpose, Lopez Portillo stated, is to "promote unified and balanced urban development...in terms of needs for land, housing, services, infrastructure, equipment and urban ecology." Mexico's population of 68 million is two-thirds urban, one-third rural, the reverse of the situation 50 years ago.

"Because environmental pollution is a serious social problem, its prevention and the conservation and improvement of our environment is a task and responsibility that must be shared by all our citizens—people and government alike—in a genuine act of solidarity so that we can face our destiny with dignity," the President said.

KATHERINE HATCH



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An Arab sheikhdom is shaken by an unexpected oil slick

BAHRAIN—Even a relatively little oil spill can do a lot of damage, as this island sheikhdom of 598 square kilometers has learned to its regret. Beginning August 26 and continuing for the next two days, 3-to-4,000 barrels of crude oil washed ashore, layering 20 miles of northern and western coastline with a brown-black sludge. Fishing, an important Bahraini industry, has been disrupted and beaches have been abandoned to the mop-up crews.

Prime Minister Sheikh Khalifa bin Sulman Al Khalifa has drafted 600 men to begin clean-up operations, which are expected to last a month. Their effort with shovel and rubbish disposal bags has been supplemented by Bahrain Defense Force boats and Arabian American Company (ARAMCO) helicopters which sprayed the slick with low-toxic dispersants.

ARAMCO and the Bahrain Petroleum Company are two of the 17 members of the Gulf Area Oil Companies Mutual Aid Organization (GAOCMAO) pledged to assist each other in fighting oil pollution in the Gulf. The Arabian Gulf is a relatively shallow and nearly land-locked body of water where evaporation exceeds input, and the water level is maintained by water flowing in through the Strait of Hormuz. For these reasons a major oil spill poses a particularly acute threat to the ecology of the region as its effects are likely to be long-lasting. Forty percent of the world's oil supply is ferried through the Strait of Hormuz at the rate of 20 million barrels a day.

There has been no official allocation of blame for the Bahrain spill, but speculation centers on the ARAMCO tanker loading terminal of Ju'aymah about 88 kilometers away on the Saudi coast, where a hose break occurred little more than a week before the slick first touched the Bahrain beaches.

Criticism in the local press has been directed at the lack of warning officials here had of the impending pollution. Bahrain's Director of Fisheries, Khalid Fakhro, said that the first he knew of the slick was when he read about it in the newspapers; another official involved in the clean-up operation was quoted as saying, "The first we knew of the slick was when it arrived...We were all quite shattered."

Fuels ...

THE SOUTH PACIFIC COMMISSION, comprising the governments of Chile, Colombia, Ecuador and Peru, have announced that they will cooperate in establishing plans to deal with offshore oil spills and other natural catastrophes, following their latest meeting in Lima.

The future controls and emergency plans by the organization will become increasingly important as more large petroleum shipments pass through coastal waters adjacent to the South American nations. Currently, Ecuador is a regular supplier of oil for Chile, although the latter country is raising its offshore production in the extreme southern waters of the Magellan Straits.

ZIMBABWE MOTORISTS are now buying a gasohol that contains up to 50 percent locally produced ethanol, either from coal or from sugar molasses. There is no "pure" petrol, or gasoline, to be had.

Oil producers in Abu Dhabi, Kuwait and Saudi Arabia have told a delegation from Zimbabwe that they are anxious to help in the development of ethanol and the electrification of the national railways. Delegation leader C.G. Tracey, said, "The Arabs are keen to reduce the flow of their oil to Africa and are therefore most helpful in ways that can achieve their objective. They want to encourage self-help schemes so that their limited oil stocks can last longer."

Zimbabwe has long term plans to electrify much of the rail system, based on hydroelectric power from the river Zambezi, and the new government of Robert Mugabe is refurbishing about 100 steam engines.

UNLESS VENEZUELA'S LIMITED REFINING capacity, now 1.5 million barrels a day, is enlarged at considerable cost, the rising internal demand for gasoline and gas will precipitate an energy crisis by 1987, according to Ministry of Energy and Mines figures.

Enlarging the refineries and adapting them to process plentiful heavy crudes would cost Venezuela \$6 billion.

Gasoline consumption is rising 9 percent a year; high octane gas use jumped 23 percent between 1977 and 1978. The estimated per capita consumption of gasoline is 864 liters for every Venezuelan, or some 11 billion liters total.

Industrial demands tap principally one source, natural gas, and account for 45 percent of the total energy consumption. The Ministry estimates that by 1990 there will be a deficit of 10 billion cubic meters of gas.

There is no official warning system operational in the Gulf, but at the initiative of the UN Environment Program, efforts to combat pollution have been coordinated in the Kuwait Action Plan (KAP). Established in Kuwait on December 21, 1978, KAP aims to lay down guidelines for those actions which affect the quality of the environment and to develop measures on which cooperative efforts will rely. Ironically, its headquarters, known as the Marine Emergency Mutual Aid Center, is slated to be Bahrain, and editorial writers here are asking why two years have not sufficed for such a center to be set up.

SPECIAL TO WER



Israel's energy plan causes transboundary problems

JERUSALEM—Diversification is a recurrent word in Israel's energy vocabulary. In the aftermath of the return of the Sinai oil fields as part of the price of peace with Egypt and barring the discovery of significant oil reserves, Israel's policy calls for a steady reduction of oil imports, for diversification of energy sources and for development of local energy resources.

One "local" scheme has already created problems with Israel's neighbors. On August 24th Israel's cabinet approved a plan to join the Dead Sea to the Mediterranean via a canal and tunnel. By using the 400-meter drop between the two seas to produce hydroelectricity, supporters say the 600-megawatt power plant could go a long way towards meeting the country's energy needs by the year 2000. It would also raise the Dead Sea's water level, help develop agriculture, provide water for industry, and be a source of cooling water for potential inland power stations. The problem is that half the Dead Sea lies in Jordan. Its huge potash plant would be flooded if the scheme went through, meaning that \$500 million in foreign investment would be washed away. The Jordanians say they will use Arab financial clout to make sure no one puts up money for the canal. The Egyptians also have a gripe: The canal's proposed route crosses its occupied Gaza Strip.

A second planned hydroelectric station at Almagor, in northern Israel, will take advantage of the 250-meter difference in height between the Jordan River and Lake Kinneret (the Sea of Galilee). Proposed for 1985, it involves diverting the river's water into the lake, resulting in a waterfall expected to produce 100 megawatts.

The retreat from imported oil, constituting 99 percent of Israel's total energy consumption, is also being synchronized with an advance toward coal. Despite the absence of local coal reserves, the switch to coal is a basic tenet of Israel's energy policy for two reasons: firstly, the more even distribution of coal throughout the

world will enable Israel to purchase it from a wider variety of sources thus freeing the country from almost total dependence on an unstable, precarious supply of oil. Secondly, the price factor—coal is approximately half the price of oil—makes the switch almost inevitable in Israel's inflated economy where energy expenditure accounts for 8.5 percent of the GNP.

Israel's first coal-fired power complex, four units of 350 megawatts each, is being built in Hadera, on the Mediterranean coast between Haifa and Tel Aviv. Two giant 250-meter-high stacks mark the site of Israel's largest building project, its cost \$750 million. Full operation of the power plant—the first unit is scheduled for operation next year—will supply 40 percent of Israel's total energy system and will reduce oil imports for power plants from 2.8 million tons per year to 1.9 million tons annually.

The decision to turn to coal was accompanied by intensive deliberation on its potential impact on the environment. A number of interdisciplinary expert committees, in which residents of the region participated as full partners, studied such environmental aspects of the subject as coal transport, pollutant emissions, and ash generation and disposal. As a result of their recommendations, permit conditions for operation of the power complex enumerate requirements for environmental protection. Foremost among required steps is a sophisticated, automatic monitoring system of 12 stations designed to ensure that pollutant concentrations do not exceed permitted standards.

The coal itself will be directly unloaded at the port of Hadera onto an offshore terminal and transported via closed conveyor belt to the power complex.

A second coal-fired complex is being planned for the south of the country. Recommendations for siting have recently been presented to the National Council for Planning and Building, which was scheduled to begin deliberations on the subject in September. Plans are for four units of 550 megawatts each, the first of which is scheduled for operation in 1986-87 when Israel's energy demand will be about 3065 megawatts—based on a forecasted annual growth in energy demand of 6.3 percent. It is estimated that by the end of this decade oil imports will be reduced to under 1 million tons a year.

In order to further reduce Israel's energy expenditure, the possibilities for switching heavy industry to coal are being investigated. Currently weighing this possibility are the cement and petro-chemical industries.

Since neither coal nor oil is indigenous to Israel, ongoing intensive research aimed at developing alternative sources of energy, particularly solar, is receiving high priority. Israel, with a climate well suited to the exploitation of solar energy, is a world leader in the field. Today, approximately 400,000 solar collectors for water heating are installed in Israeli buildings serving about 40 percent of the population. The percentage is expected to increase steadily in coming years as a result of recent regulations requiring installation of solar collectors in all new buildings. In addition, an amendment to an existing law will enable residents in cooperative apartment buildings to disengage themselves from the central heating system in order to install collectors on an individual basis.

Energy sources...

THE GROWING DEMAND for electricity in Japan and the move to find alternate sources of energy have prompted a revival in pump-up powerhouses which recycle once-used water to generate more electricity.

Kansai Electric Co. began operating six pumpup powerhouses in Nara Prefecture this summer with a combined output capacity of 1.22 million kilowatts monthly. Chubu Electric Power Co. plans to put into operation two plants generating 2.19 million kilowatts in Aichi Prefecture.

Thirteen other stations are under construction and are expected to contribute to the monthly output of 29 million kilowatts by 1986, the target year for completion. Electricity generated in this manner is expected to increase 3.6 times its present level by 1986, according to news reports.

THE BRITISH MINISTER responsible for energy conservation, John Moore, recently announced that 18 local authorities had expressed interest in having the government test Combined Heat and Power/District Heating schemes in their localities. This is a scheme in which waste heat from power stations is used to provide heating for homes, offices and factories. The government believes that utilizing waste heat could save the UK 30 million tonnes of coal equivalent each year. Moore said the consultant firm of W.S. Atkins and Partners will select from the 18 a short list of sites where the system could be tested quickly and economically.

THE INDIAN GOVERNMENT has set up a committee to study further scientific data and determine whether the southern Kerala State government can go ahead with the Silent Valley hydro-electric project without "significant ecological harm."

This was decided at a meeting between Prime Minister Indira Gandhi and the State Chief Minister E.K. Nayanar and other officials.

The immediate gain of cheap power from a 120 megawatt generator and a dam which, at best, may have a life span of 30 to 50 years will be discussed again against the dangers of cutting up a balanced biosystem evolved over several million years. The submerged area would be just 10 percent of the valley but the chain reaction would be traumatic, many scientists believe.

The committee will finalize its report within three months. Meanwhile, the Kerala Government is preparing an additional project to meet the power needs of the state. It has not yet given up the Silent Valley though the Federal government has suggested it choose an alternative and build a national park in the valley to protect rare species of animals and plants.

Renewable energy...

IN TAIWAN research institutes are close to commercializing the production of solar cells. Two local companies—the Fine Products Microelectronics Co. and the President Enterprises Corp.—will soon manufacture solar cells for both the domestic and foreign markets.

In a related move, an energy research institute is to be set up in Taiwan to further cooperation in solar cell research between the U.S. and Taiwan.

A BRAZILIAN UNIVERSITY has completed a three year experiment on the possibilities of using solar energy to dry agricultural products including coffee beans. According to Unicamp (the University of Campinas in the state of Sao Paulo) the process uses a solar collector which heats air up to 60 degrees Celsius. This air is then passed over the product to be dried. Project coordinator Jean Meyer asserted that the process has proved to be much more efficient than conventional techniques.

AN INDIAN GOVERNMENT-OWNED COM-PANY, Allwyn, will soon manufacture solar clocks, in collaboration with the Seiko Company of Japan. Allwyn's chairman, Ajit Singh, claimed there is no risk of the solar clocks stopping on rainy days, for the solar power cells have the capacity to store enough energy to make them run for three months at a stretch without any sunlight.

A TWO-YEAR EXPERIMENTAL PROJECT using small windmills for generating electricity and pumping water has proved to be a failure. The project was organized by the Japanese Science and Technology Agency.

It set up eight windmills on a mountain, a golf course and along a hilly seashore. All had a generating capacity of one kilowatt at a windspeed of 10 meters a second. The result showed that the cost of using windmills for generating electricity was far greater than that of using oil. The combined output of all eight windmills in the experiment would be just enough to meet the energy needs of one family.

According to agency researchers, one reason for the failure was simply the dependence on wind. Another problem was in the system of storing the generated energy in batteries. Since the volume of power generated was low and there were periods of complete standstill, there was a natural loss of energy from the battery.

Following this project, the agency plans to test larger windmills of 20 kilowatts. Meanwhile, the Ministry of International Trade and Industry (MITI) is also planning experiments with windmills of 100-kilowatt capacity.

Among the most recent breakthroughs in the realm of solar energy was Israel's inauguration last December of the world's largest solar-electric power plant activated by a solar pond. According to Energy Minister Yitzhak Modai, the activation of the 150-kilowatt pilot plant in Ein Bokek, on the shores of the Dead Sea, may signal the start of a process whereby the Dead Sea will be converted to a "Sea of Life" able to supply a large percentage of Israel's energy needs.

Planned for operation by the end of 1981 is a 5 megawatt solar power plant activated by a solar pond of ¼ square kilometer which will be expanded to 1 kilometer to serve a 20 megawatt unit in 1983. Also planned for 1983 is an experimental model of a sun lake—a solar pond floating on a large salt-water lake such as the Dead Sea. If appropriate means are found, Israel hopes to produce 2000 megawatts upon an area of 500 square kilometers by the end of the century.

A three-year American-Israeli cooperation agreement in research and development of solar energy was recently signed in Washington. One of the projects to be implemented as part of the \$2.9 million agreement involves extraction of energy from agricultural waste based upon technology developed in Israel. The Israeli project is sponsored by the Ministry of Energy and Infrastructure and the Kibbutz Industry Association. Digestion of all available biodegradable organic matter is expected to bring about energy self-reliance in the kibbutz. Anaerobic treatment of other sources of organic wastes from the urban sector, envisioned for the future, will create a new source of energy while ridding the environment of offensive materials. After five years of research and development, the project is now in the implementation stage at Kibbutz Kfar Giladi.

While anaerobic digestion is not a new technique, the Israeli project offers a large-scale, practical, economically feasible program with numerous advantages over similar systems developed elsewhere in the world. Fifteen foreign firms have already submitted their requests for purchase of the know-how and equipment developed in the Israeli project.

Still another area of investigation into local sources of energy is shale oil exploitation. It is estimated that approximately 2 billion tons of oil shale exist in Israel capable of producing approximately 1 million tons of oil. A new body, "Energy 2000," has recently been formed to examine possibilities of fuel extraction from shale oil and from coal.

Among other energy alternatives currently being investigated are possibilities for exploitation of the Kinneret Basin's lignite reserves (where pre-feasibility studies have pointed to a potential of 300 megawatts for 30 years); utilization of wind energy; and use of geothermal energy.

Finally, utilization of nuclear energy, approved in principle several years ago, remains an option which may join coal, solar, hydroelectric, wind, geothermal and other energy sources as economically feasible in filling Israel's energy needs by the year 2000.

SHOSHANA GABBAY

The World Bank wants to start an energy lending affiliate

WASHINGTON—The World Bank is exploring the idea of setting up an energy affiliate to provide additional financing so developing countries can meet their "urgent need to expand domestic energy production," Bank president Robert S. McNamara announced in August.

The announcement came from the Bank's comprehensive survey, "Energy in the Developing Countries." In it the multinational lending agency says that the Third World's bill for importing oil could more than double to \$110 billion in just a decade if domestic production grows no faster than in recent years. But, McNamara said, "By maximizing energy production... and by a vigorous program of energy conservation" developing countries could cut their oil-import bill in 1990 by \$25-30 billion.

The Bank estimates that the total investment needed for energy aid is \$450 to \$500 billion from all sources. Over the next five years, the Bank's planned energy loans would be \$13 billion, but McNamara stated \$25 billion "is both desirable and feasible." Therefore, the agency is considering setting up an energy affiliate, although a decision on the proposal will not be made until next year.

This would enable the Bank to substantially expand its lending for fuelwood, initiate work in alcohol production from biomass, and help developing countries make better use of their energy resources by building or improving refineries, investing in energy saving devices, and developing more efficient processes in industry, such as retrofitting. When completed, the agency estimates the expanded program would produce—or save—energy equivalent to 2.9 million barrels of oil a day, or 9.5 percent of the Third World's consumption in 1990.

The Bank suggests there is a need to increase oil exploration and to recover natural gas liquids. It says that coal reserves in the developing countries are widespread and that "with a concentrated effort," their production could nearly double at the end of the decade. And it says that there is a tremendous hydropower potential in the developing countries, for they have roughly half the world's potential while only 10 percent has been developed.

"A second energy crisis," the report says, is that the demand for fuelwood has grown far faster than supply, leading to use of crop residues and animal dung. The Bank study says that some 50 million hectares of fuelwood would need to be planted in the developing countries by the end of the century to satisfy the projected demand for domestic cooking and heating. This would require a five-fold increase over current planting worldwide, with a 15-fold increase in Africa, where up to 90 percent of all energy comes from traditional renewable resources.

More efficient energy use could reduce projected consumption by as much as 15 percent, the Bank study asserts, adding that many of these measures involve little or no investment and would yield significant results quickly.

LIBBY BASSETT

Conservation ...

ENERGY CONSUMPTION in South Korea has been sharply reduced during the first half of this year. According to figures released by the Ministry of Energy and Resources, electricity demand in July was up only 2.6 percent from the same period last year. The increased rate registered last year was 9.2 percent. Electricity consumed during the first six months totalled 15.94 million kilowatts, representing an annual growth rate of 5.1 percent compared to 18.6 percent recorded last year. The figures showed that household power consumption slowed down more than any other sector.

NEW, LOWER HEATING LIMITS to be enforced in non-domestic buildings from October 1st could save Britain the energy equivalent of one million tonnes of oil a year.

As part of its energy conservation policy, the Department of Energy announced the reduction from 20°C (68°F) to 19°C (66°F) of maximum heating limits in public buildings, offices, shops and industrial premises.

IF ONLY 30 PERCENT OF BRITISH HOUSEWIVES changed to cold water detergents on washday, they would save the nation £100 million (\$235 million) each year, equivalent to the output of two power stations.

Dr. Richard Murray of Scotland's Center for Consumer Education and Research, which made these calculations, accuses the two major detergent producers who control 90 percent of the British market—Lever Brothers and Procter & Gamble—of deliberately avoiding cold water detergent production to protect their profits. Hot water powder detergents demand large-scale production to be cost-effective.

The detergent companies and representatives of the Consumer Association magazine "Which" say that cold water detergents have been given pilot trials which showed the detergents were not as effective, did not fit into the wash cycles of the majority of British machines and met with the alleged conservatism of the British housewife.

BRAZIL'S DETERMINATION to cut back on oil consumption through a program of enforced control is beginning to take effect. From January 1 next year, Brazilian saw mills and companies in the grain, leaf, lumber and mineral drying sector are to have their supplies of fuel oil cut off and will have to convert to other energy sources.

According to the National Petroleum Council, the companies involved were warned of the cut-off date some two years ago. Conversion funding of almost \$20 million has been provided by the government.

Water wise...

DANISH COMMUNITIES will receive new instructions around the new year on better safeguarding of the country's water supplies. The new rules from the Environmental Protection Agency should have been completed several months ago, but the need to confer with various organizations held up their issuance. Under Danish law, central authorities set up goals and guidelines, leaving actual law enforcement to municipal and county governments.

The Agency believes it is holding its own in its fight against water pollution, but what it wants to see is a real improvement in water quality. Recent statistics show that the fight for cleaner water accounts for up to 75 percent of the antipollution funds spent by national and local bodies. Industry has long been considered the major offender, but recent studies in Jutland showed that 70 percent of the farms studied were violating environmental laws.

IRELAND'S FIRST WATER QUALITY map was just published by An Foras Forbartha which reported that in general the quality of Irish freshwater resources was good or satisfactory. The highest geographical concentration of rivers with polluted stretches were found in the Eastern Counties.

Town sewage and farm wastes were particularly blamed for pollution difficulties in rivers.

NEPAL hopes to supply safe water to almost all its major cities and towns by 1990—and to restore and extend its sewerage service in Kathmandu and Lalitpur. The \$33.3 million project will get a long-term \$27 million loan from the World Bank, which will be used not only for construction and consultant services but also for training fellowships overseas.

THE COLIFORM LEVEL of Hong Kong's wells exceed accepted safety levels for drinking water by more than 2,000 times, according to a recent survey done by Dr. Mark Kai-Keung, a lecturer of the Chinese University of Hong Kong. The faecal coliform levels in some 100 wells being studied average 5,000 per 100 milliliters, while the World Health Organization's recommended level is 2.2 per 100 ml.

The survey also revealed that pollution in streams is getting worse. Since the stream water collects in reservoirs, Dr. Mark warned that faecal bacteria may be carried into reservoirs. Although no reservoirs appear to be badly polluted at present, the danger of contamination is increasing all the time, he said.

At last: the Law of the Sea conference draws up a treaty

GENEVA—A complicated compromise between the developed and underdeveloped world appears to have broken a six-year impasse over mining the ocean floor's mineral riches, permitting the ninth session of the United Nations Law of the Sea Conference to close (Aug. 30) with predictions of agreement on an historic treaty at the next session in March.

"It is now all but certain that the text of a convention on the Law of the Sea will be ready for signature in 1981," U.S. Ambassador Elliot Richardson declared. "Historians looking back on this session," he continued, would see it as "the most significant single development of the rule of law since the founding of the United Nations itself."

Richardson said that the key to breaking the impasse was an agreement over decision-making with a 36-nation Governing Council of a proposed International Seabed Authority.

The compromise gives the U.S. and other Western industrial countries, which have the technological expertise to mine the ocean floor, a veto over all important decisions taken by the new International Seabed Authority that will regulate seabed mining. The Authority will license private deep sea mining outside any country's 200-mile economic zone and will carry out some mining activities on its own. Profits made by the Authority and the taxes it will receive from the private firms will be turned over to the United Nations to assist less developed countries. The industrialized countries have agreed to lend the Authority \$1 billion to finance the first deep sea mining exploration.

Delegates are taking the overall agreement back to home capitals for study before sitting down together again in March, probably in New York. But practically all of the details have been in the hands of world governments as they emerged during six years of often tortuous negotiations. Most governments will be merely giving an official stamp of approval to terms they have already cleared.

Therefore the Chairman of the Conference, Ambassador Shirley Amerasinghe of Sri Lanka, called the meeting "very successful" and predicted that "we will get an agreement next Spring."

Although the key breakthrough was on the mining roadblock, there are other aspects to the new draft Convention:

- recognition that states have an exclusive right to all oil, natural
 gas, fish and other riches found within a distance of 200 miles from
 their coastlines, although in some cases they would have to share
 such income with land-locked countries.
- rights of free passage and overflight for all nations through the straits and archipelegos of the world.
- obligation on all signatories to curb pollution of the seas by their own ships and from their own shores. WILLIAM G. MAHONEY

Rats! A sound barrier the polluting rodents can't cross

OSLO—Luckily, rats and mice can't break the sound barrier—a barrier of high-frequency sound that hurts their ears and keeps them away from human food.

A Norwegian firm, Scancontrol A/S of Asker, spent five years developing and testing a system that broadcasts on frequencies so high the human ear can't hear them, but which are intolerable to rodents. The sonic system is already used in Norwegian food factories, warehouses, grain silos and restaurants. Small loudspeakers attached to ship hawsers and gangplanks are also keeping rats away from some passenger and cargo ships. Bjoern Mortensen Jr., Scancontrol's manager, predicts that soon, "There will be no more rats to leave sinking ships."

The system has proved so effective that it is being exported by Skatron A/S of Drammen to Iceland, and the United States, West Germany and the Netherlands for testing.

It has a central sound generator which transmits on differing frequencies or constantly sweeping frequencies to several loud-speakers. "This is to secure that the rodents do not get accustomed to one particular high-pitched sound," Mortensen said.

Rats are more than just pests; they have been responsible for terrible plagues and, says the World Health Organization, rodents destroy 33 million tons of food grain annually—enough to feed 200 million people. Insurance companies claim rodents may be responsible for 25 percent of all fires of unknown origin, because they gnaw on electric wires.

They are so voracious, Mortensen said, that if kept away from food by the sound barrier, they may eat anything, even poisoned bait or one another and, as a result, their numbers may dwindle.



ANALYSIS: A case study in conflicting methods of conservation

SPECIAL TO WER

NAIROBI—The vicuna, back from a brush with extinction, has long symbolized the problems of threatened species in South America. Today, it epitomizes the world-wide conflicts between traditional and modern conservation.

At one time the vicuna, a wild cousin of the camel, used to roam all over the Andes. But its habitat was severely diminished during this century and, by the late 1960s, it had become confined to a few scattered sites and was threatened with extinction. The La Paz Agreement of 1969, signed by all five Andean nations (Peru, Ecuador, Bolivia, Chile and Argentina), put a halt to trade in vicuna

Agriculture ...

INDIA'S CENTRAL ARID ZONE Research Institute in Jodhpur says that rodents are the number one enemy of the desert. They destabilize the sand dunes by burrowing and upset the ecosystem resulting in expansion of the desert.

An Institute expert, Dr. Iswar Prakash, told WER that seventeen species of rodents had been recorded so far in that area, and that gerbils were the most destructive because of their voracious appetites for grass.

RICE is food—and shelter and energy, says scientist Dr. M. Khalid Farooq of Pakistan's Council of Scientific and Industrial Research in Labore.

In his paper, "Rice Husk—A Renewable Energy Source and an Important Mineral," he asserts that rice husks have a calorie value nearly half that of good coal. He says the heat from burning husks can be used for drying rice or to produce steam for generating electricity, or to fire bricks in a specially designed kiln where the valuable ash can be recovered without contamination. The ash, which contains silica, can be used to produce a cement at around \$19 a ton. And the silica can be used for making insulation bricks.

A RICE GENE from Kerala, at the southernmost tip of India, has helped combat a plant pest that might eventually have threatened the globe, said Dr. B. P. Pal, Chairman of the National Committee on Environmental Planning and Coordination. The brown plant hopper, which was destroying rice plants on a massive scale in Indonesia and other southeast Asian countries five years ago, does not attack the Kerala variety. Therefore, this variety can be used by scientists for producing new hybrids and may do more to boost rice production in the region than almost any other kind of crop protection measure in the last decade.

PAKISTAN'S AGRICULTURAL RESEARCH Council is formulating a comprehensive study for better utilization of salt-affected soils by introducing salt-tolerant crops.

Agricultural scientists met in Islamabad this June to work out details of the project.

Nearly 7 million hectares of land have been affected by salinity. The meeting recommended that a country-wide survey be conducted to determine the natural dominant vegetation in different saline soils of the country. Since drainage is an expensive and long-term solution for water-logged areas, the scientists hope to identify crops of economic importance that can be grown in saline areas. This strategy would not only provide interim relief but would also lead to better utilization of the affected land.

Environmental management...

IUCN, the International Union for Conservation of Nature and Natural Resources, has a new director-general, Lee Talbot, an American ecologist. Talbot, who will succeed David Munro, a Canadian, has been Conservation Director of the World Wildlife Fund, and as a result is well-known around the world. He has received several awards for his achievements.

THE WORLD WILDLIFE FUND'S new director of conservation Dr. Arne Schiotz, a Dane, stresses the need to maintain balance in save-the-species campaigns: "It's important to consider the whole picture and remember that there must also be room for people."

Dr. Schiotz, who has led the Danish Aquarium at Charlottenlund since 1964, takes a pragmatic view of the future of some species in their wild state. "Sometimes, I regret to say, we must admit that there isn't room for a large-sized animal in an area with good agricultural soil, so the animal must make way for man. It's necessary to recognize this and consider it in our planning, rather than get involved in a hopeless quarrel with the local population." However, he believes that "if it's a case of a rare species, or an animal that is threatened with extinction, then it can be saved in a zoo."

THE UN ENVIRONMENT PROGRAM (UNEP) is thinking about sponsoring an association of development and environment journalists on a world-wide basis. The aim would be to foster cooperation among journalists in the exchange of information, ideas and trends, The idea came from 19 journalists from several Asian countries who met recently in Singapore to discuss ways of improving environmental reporting in their own countries. The workshop was sponsored jointly by UNEP and the Asian Mass Communication Research and Information Center (AMIC).

CORRECTION: In the August 25th WER on page 7, "U.S. Ambassador...," Masayoshi Ito was erroneously identified as Japan's Prime Minister; he is its Foreign Minister.

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products, particularly its luxurious and very expensive wool. This Latin initiative was consolidated in 1973 by the Convention on International Trade in Endangered Species, in Washington, D.C.

At its nadir in 1968, the largest herd was at the Pampa Galeros National Reserve in Peru—just 1,000 vicunas. But by 1979, with complete protection, one census found that they had increased to 43,000, too many for the 260 square miles of reserve. So the Peruvian government formulated a plan for regulated culling, to keep their numbers within the "carrying capacity" of the Pampa Galeros. Their wool and meat would be sold to raise funds for conservation, though this would be a by-product activity, not the reason.

Dr. Felipe Benavides, a Peruvian who had fought since the 1950s to save the vicuna and who had won the prestigious Paul Getty Prize for Conservation, was not about to see wildlife managers shoot vicunas. He drew international support from European conservationists, who had begun their save-the-species campaigns shortly after World War II.

Ranged against these traditional conservationists was a new breed, primarily from the Third World, who asserted that wildlife is a natural resource that should make its economic contribution to development aspirations.

The conflict came to a head last year at an IUCN Survival Service Commission meeting held in Costa Rica. It was finally agreed that culling should go ahead, with part of the proceeds to be spent on translocating a few vicuna herds from Pampa Galeros to new reserves in Peru.

Then in April 1980, a British scientist, Prof. S. Keith Eltringham of Cambridge University, reported the results of his survey of Pampa Galeros—that there were only 15,000 vicunas there, not 43,000. Conservationists from North America and Europe fired off cables to the President of Peru, once again asking that the vicuna be protected.

The conflict surrounding the vicuna could apply as well to the elephant or the tiger or any other species. Should it be considered a natural resource under the exclusive jurisdiction of its host countries? Or is it a natural heritage that belongs to the global community? What should be done when a species is saved and then multiplies beyond the carrying capacity of its habitat? Should the same commercial interests that nearly destroyed the vicuna be allowed a say in its future management? Can the traditionalist approach of the advanced nations offer substantive solutions to the fundamentally different problems and opportunities of developing nations?

Since anywhere from two-thirds to three-quarters of all species exist in the tropics, what kind of special responsibility does this imply for developing nations to safeguard everyone's heritage? And does this postulate a gesture on the part of rich temperatezone nations to subsidize conservation efforts by Third World nations?

Clearly, the challenges of the future with the possibility of one million creatures going extinct by the end of the century, call for an expanded form of conservation on behalf of threatened species. But should we aim for "the same as before, only more so," or do we need to formulate basically fresh strategies?

NORMAN MYERS

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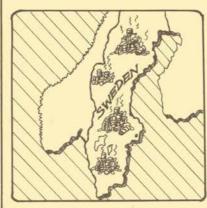
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Sweden's toxic waste facility has trouble finding a site

STOCKHOLM—Sweden seems to have an environmental orphan on its hands—SAKAB, the Swedish Waste Conversion Company. It is responsible for handling the country's toxic wastes, but virtually nobody wants to give SAKAB a home.

Under legislation passed in 1975, SAKAB was to treat the country's hazardous waste at a central facility. It planned a new and enlarged setup at Norrtorp in the very heart of Sweden to handle 100,000 tons of environmentally dangerous waste. But the National Environment Protection Agency (NEPA) objected to the site, and local inhabitants protested as well.

Since then the story has been pretty much the same. Site after site came under consideration and time after time the communal councils and local opinion said "not here."

Then Kramfors in northern Sweden saw a chance of creating 200 badly needed jobs and invited SAKAB to set up there. It has good rail and road connections and a deep-water harbor plus another attraction, an abandoned pulp plant on a neighboring site where methanol could be manufactured as a by-product of the wastemethanol to stretch gasoline supplies and thus cut oil costs.

SAKAB applied at the end of July for a license to build at Kramfors while it continued to examine the practical and economic aspects of settling down at a point so distant from central Sweden where most of the toxic waste originates.

Almost at once, Kramfors inhabitants began a protest action to stop the project. Protest lists with 4,559 signatures have already been handed to the district council and more lists are in circulation.

While the decision about where to build drags on, Sweden's toxic waste continues to pose a serious problem. The country no longer has the capacity to handle it.

Swedish industry every year pours out an estimated 500,000 tons of waste that is dangerous to the environment, said NEPA's official monthly journal, Miljoeaktuellt.

Approximately 20,000 tons of the most hazardous waste was

In Europe ...

TOUGH NEW LAWS to control the carrying of chemicals on Irish roads will be implemented this September. The laws are being introduced in response to growing concern about the dangers of unregistered and unmarked trucks hauling dangerous chemicals.

From September trucks carrying any of 25 listed substances must display signs indicating what they are carrying and the dangers from the chemical. If an accident occurs, authorities must be fully notified of the necessary controls to be implemented. Densely-populated areas must be avoided by the trucks.

GREENLAND'S home-rule government and Danish authorities want more information before they okay a Canadian plan for liquid gas transportation through the Davis Straits off western Greenland. Petro Canada plans to transport gas in large ice-breaking tankers on a year-round basis along a route that would come within 45 kilometers of the Greenland coast.

Greenland authorities fear the tankers would endanger seal colonies in the area, for seals are an important food source. There's also concern for oil pollution of the sensitive coastal area if a tanker should run aground and fuel tanks start leaking.

PORTUGAL AND THE UN Development Program are working together to learn more about pollution in the nation's major estuary, the Tejo (or Tagus). Foreign and local specialists are making a three-year study of water quality, living resources and wastes not only of the estuary but also along adjacent coastal waters.

Philip O'Kane, the chief technical advisor, told WER, "The Tejo is not nearly as polluted as the Thames, Mersey or Rhine. If measures are not taken, the situation can become serious but as it stands there is a good chance of cleaning it up."

Untreated wastes from 600 industries and the nation's capital, Lisbon, pour daily into the Tejo; however, experts believe 40 major industries are responsible for most of the industrial waste. A full report with alternative courses of action to combat pollution of the Tejo is expected to be ready within a year.

IN WEST GERMANY, combined state and industrial investments in environmental protection between 1977 and 1981 total about 83.2 billion marks (\$46.2 billion).

Industry's total investment was placed at 46.8 DM billion, the Ministry of the Interior announced, with public funding at 36.4 billion.

According to a Battelle Institute study, the total spending on environment in West Germany amounts to 1.4 percent of the country's gross national product.

licensed for export last year—to West Germany, England, Denmark and the Netherlands—for destruction, storage or recycling, Miljoeaktuellt said.

Of the waste which wasn't exported, Miljoeaktuellt said that SAKAB, which has primary responsibility, handled only 11 percent. Industry itself took care of 40 percent, the communities 2 percent and other firms which accept such waste handled the rest.

The situation will grow worse if SAKAB's Industridestillation (ID) disposal plant at Loevsta outside Stockholm is shut down when its license expires at the end of 1980. This facility mainly handles hazardous liquids. Stockholm officials and various local resident associations oppose SAKAB's request for a license extension.

If ID's license is not renewed under the environment protection law, then the mountain of waste will grow and become a major problem. Said Anders Hoejlund, NEPA's expert on toxic wastes, "It is then that the real panic can break out."

Periodically, the Swedish press raises alarms about drums of poisons illegally dumped in gravel pits and in forests by unlicensed transport firms. Miljoeaktuellt commented that "as long as it is difficult to get rid of waste, there is the risk that it will disappear via unknown and illegal ways."

Meanwhile, Director Bo Helmerson of the Swedish Industrial Federation disclosed in Svenska Dagbladet that a common Nordic plant to handle wastes is under discussion with the Federation's counterparts in Norway and Finland. "We think that the plant SAKAB is planning for Norrtorp (or Kramfors) is too big for Sweden," he said, "but a large facility is rational, profitable and provides the preconditions for better protection of the environment." He added that the "interest among industries to take care of their own waste themselves under full environmental security control is increasing" because oil now is so expensive; therefore the energy and raw materials in waste become more valuable.

SPECIAL TO WER

The UN's weather organization wants to make rain in Spain

GENEVA—The rain in Spain may no longer stay mainly in the plain, if a research program by the World Meteorological Organization (WMO) is successful.

That United Nations organization has begun a Precipitation Enhancement Project (PEP)—medicine men call it "rainmaking"—in Spain. It is expected, WMO said, that by the time PEP is completed, in about seven more years, "scientific advances in understanding precipitation-forming processes may well allow general application of the PEP results to other regions and to other forms of (weather) modification."

Research is presently taking place in the Duero River basin near Valladolid in Spain. It began on January 14th and was to continue until May 10th. Eight WMO-member countries (Australia, Bulgaria, France, Canada, Spain, Switzerland, U.S. and Soviet Union) are participating by providing equipment and/or personnel for the observation work or the relevant analyses and interpretation.

The main purpose of the present measurement and research period of PEP is to establish whether the clouds in the proposed site are suitable for seeding and whether they occur with sufficient frequency to make the actual seeding experiments scientifically viable. A preliminary seven-week observation program was carried out in early 1979 with more limited facilities. It provided very useful information for the present phase, WMO said.

WMO will mount another observational campaign in early 1981 before initiating the seeding experiment itself, the next phase of PEP. A spokesman said that the detailed analysis of data collected during the 1979, 1980 and 1981 observational and investigation periods will serve as a basis for the decision and planning of the future conduct of PEP. The field experiment phase during which cloud seeding will take place is expected to last about four years with another year for the evaluation phase.

WILLIAM G. MAHONEY



Turkey's pollutiontarnished Golden Horn to be cleaned

ISTANBUL—Turkey's Golden Horn has become badly tarnished—by pollution.

The Golden Horn is the name given to a bay of the Marmara Sea which divides the old and new sectors of Istanbul. Over the past few years, the Golden Horn has become polluted by industries set up all along its shores.

During the first week in August, a conference was organized here by the Office of Environmental Protection to discuss plans to save this near-legendary inlet at the site where East meets West. Istanbul's Mayor Aytekin Kotil announced a \$1.5 million credit for the clean-up plan from the World Bank, along with contributions from other institutions.

To make the Golden Horn shine once again, Mayor Kotil said, would require relocating a major power station and several factories, building facilities to filter and refine industrial wastes, and strictly controlling air and water pollution in the area.

At the same time he announced that the World Bank was giving a \$100 million loan to finish work on Istanbul's sewerage system.

Meanwhile, municipal authorities said that an agreement has been reached with a West German firm for recycling domestic waste to produce electricity. About 8,000 tons of litter are collected daily in Istanbul, and experts said that burning 4,000 tons could produce 70 megawatts of power. The World Health Organization is also participating in the project and, they said, firms from Canada and Britain have expressed interest in it as well.

SAM COHEN

More on Europe...

WHAT IF A TALL AND SPREADING TREE in a neighbor's yard shades the solar heating device on your roof?

The thought has occurred to the Swedish government planning office which thinks regulation may become necessary. Therefore, it proposes the government amplify the building code with a rider stating that "reasonable measures shall be taken so that vegetation does not prevent the sun from shining on a building or the sun catchment of a neighboring building site."

If it's a question of another building throwing its shadow over a solar system, the building code already can take care of that.

THE IRISH GOVERNMENT is setting up house with robots.

An Foras Forbartha, the State-funded research agency, is buying two ordinary semi-detached houses in a Dublin suburb and moving in two robot families, "Mr. and Mrs. Waste" and, nearby, the family of "Mr. and Mrs. Save."

Everything they do over the next three years will be carefully studied, and their behavioral patterns, scientists hope, will show how the nation could save millions of pounds by demonstrating how householders can reduce weekly spending on cooking, heating and lighting.

Each house will be fitted with a variety of devices and the energy-related tasks which the typical household carries out will be studied. Information obtained will be made available internationally.

THE GREEK GOVERNMENT has prohibited smoking in all indoor public areas, and penalties for lawbreakers are prison terms of up to three months plus a heavy fine.

The only exception to the rule are special smoking areas in airports and train stations.

Pioneering the intensive campaign is Minister of Social Services Spyridon Doxiadis, who also banned cigarette advertisements on radio and television. A physician by profession and a fanatical anti-smoker, he also proposed steep price rises on cigarettes, or the imposition of a "sanitary tax," to go to the Greek Anti-Cancer Society.

The effects of the government's anti-smoking campaign have been encouraging, since figures show that the country's total consumption of tobacco from 1977 to 1978 increased by 5 percent, while from 1978 to 1979 only by 0.07 percent.

In the Middle East ...

PINK AND BLUE POLKA DOT mountains in Israel's Galilee? Not if Israel's Nature Reserves Authority (NRA) has a say in the matter. The planned aerial spray painting is to be part of an artistic happening scheduled for early September in Tel-Hai in northern Israel in which artists will utilize the landscape in their creative work.

The NRA declared such spraying to be a legal offense and called upon the Regional Council of the Upper Galilee, initiator of the event, to withdraw its support of any activity which might damage the natural landscape. The NRA called upon Galilee residents to preserve their scenic landscape which has been a source of inspiration to artists for many generations.

GARDENERS IN JERUSALEM have saved the city over \$1 million in fees which otherwise would have been paid private contractors to develop sites throughout the new capital. Through their own resources, the volunteer gardeners succeeded in adding 38 public parks, recreational areas, green belts, and tree-lined boulevards during 1979-80.

With this addition, the municipality's gardeners will now be responsible for the care and maintenance of 401.2 hectares of parks, gardens, groves, and green belts throughout the city.

THE SOCIETY FOR THE PROTECTION OF NATURE in Israel has been awarded the coveted Israel Prize for its activities in behalf of environmental quality. The presentation was made on Israel's Independence Day to Professor Amotz Zahavi and Azaria Alon who helped found the society in the early 1950s.

The society has been instrumental in passing a number of environmental laws and has been especially successful in mobilizing public participation in campaigns calling for the protection of nature. Today, the society devotes the lion's share of its work to educational activities. Within this framework, it operates 23 field schools which are vital in educating Israel's youth toward a recognition and appreciation of the valuable natural assets of their country.

THE DEMOCRATIC REPUBLIC OF YEMEN will embark on a \$39.2 million project to alleviate the critical shortage of safe drinking water in Aden. When completed in 1987, the project will increase the water flow to 1,000 liters per second by rehabilitating the existing water system and enlarging it to draw on water supplies from the Wadi Bana and Bir Nasir areas of western Yemen.

Israel will clean and clear a riverine dump near Tel Aviv

JERUSALEM—The Yarkon River, which flows through Israel's most populated region, metropolitan Tel Aviv, is going to be transformed from a dump into a clean, free-flowing stream with parklands on either side for recreation.

The 30-kilometer-long river currently is supplied with a large amount of wastewater from nearby industrial and residential areas. The Rehabilitation Project, based on a feasibility study commissioned by Israel's Environmental Protection Service and prepared by the stream monitoring unit of the Nature Reserves Authority, is designed to restore a 14-kilometer stretch at the heart of the river by removing all wastewater and adding fresh water.

The study, composed of engineering, biological, scenic and economic evaluations, outlines the steps necessary to restore the Yarkon and to transform its surroundings into a recreation site for at least a million visitors a year.

To do this, accumulated trash, tree trunks and sludge will be removed, and vegetation along the banks will be thinned. Water treatment will allow boating and swimming once again, and perhaps fishing. Many species of flora and fauna are expected in the wake of water restoration, regulation of the rate of flow and opening the river to light.

At the request of the Ministry of the Interior, plans are currently underway for the formation of a River Basin Authority to be responsible for the project's implementation.

A cost/benefit analysis of the project indicates that benefits would outweigh costs, including annual expenses for engineering and for the park. The real benefit, of course, is the availability of a haven near a crowded metropolis.

SHOSHANA GABBAY

Morocco will soon have an environment agency

RABAT—The Moroccan government has issued a special decree setting up a series of national and regional agencies with responsibility for protecting the environment. It is the first time Morocco has introduced legislation to "orient, promote and coordinate all activities related to the improvement and protection of the environment."

A National Environment Council will be set up, with representatives of 19 different government departments. They will be divided into five specialized commissions each dealing with a particular aspect of the problem, including a judicial commission that will draft new legislation to control industrial and other forms of pollution.

The national council will be assisted by regional councils for

each of the country's six major economic regions.

In the meantime authorities have already taken steps to protect and improve the environment. At Oujda, in northeast Morocco, a new \$1.2 million cement plant has been fitted with special dust and gas filters to prevent pollution of the air, even though the plant is located 45 kilometers from the nearest town.

In cooperation with a French organization, Morocco has also conducted an interesting experiment designed to preserve the country's population of Magot Monkeys, more commonly known as Barbary Apes. It is estimated that there are less than 15,000 Barbary Apes left in Morocco and their numbers are diminishing rapidly. To arrest their decline, 200 were taken to France to reproduce, and they eventually grew to a group of 850. Last June 200 of these were brought back to Morocco and released in the cedar forests of the Azrou mountain area.

At present a group of zoologists is observing the new apes to determine how they are reintegrating with other colonies in the wild state. If they manage to survive and to effect a "social" integration with their wild colleagues, the imported apes will be followed by other groups brought from France to replenish the stock.

If this experiment is successful, no doubt those responsible will be the first candidates for the new Environment Prize offered by King Hassan II to any individuals or organizations that contribute to the protection or improvement of the environment

STEPHEN O. HUGHES

Ghana launches a national environmental drive

ACCRA—Ghana's Environmental Protection Council has launched a nationwide environmental drive on behalf of the government.

The drive was announced on national radio and television just before World Environment Day by Professor Boateng, the Council Chairman. He invited Ghanians to join in to clean up the country's environment and to repair and rehabilitate broken-down facilities and services. He appealed for voluntary contributions in cash, loans of vehicles and equipment, and even muscle power. The drive, he explained, will supplement the concerted efforts to improve sanitation that are expected of all executing agencies during the four months ending September 30.

Four of the country's nine regional Ministers have since held clean-up rallies in their respective capitals with the active support of their municipal councils. The Ministry of Health, which this year postponed the celebration of World Health Day to coincide with World Environment Day, also joined in along with a number of voluntary organizations.

A complementary education campaign has been mounted. To ensure that the drive is sustained, regional environmental committees have been formed and have been meeting periodically.

EIRENE AMISSAH

In Africa...

CAREFUL MONITORING of the West African rivers where insecticides are being dropped or sprayed to control river blindness (onchocerciasis) shows that no permanent damage is being done to the local ecology.

The insecticides are being applied as part of a 20-year World Health Organization program to eliminate the blackfly that transmits the river blindness parasite. More than 100,000 people in the Volta River Basin area are blind because of the disease.

Dr. Martin Odei, Director of the Institute of Aquatic Biology in Accra, Ghana, one of two laboratories studying the effects of the insecticides, says that river organisms are adversely affected but, within a week, life forms have recovered—although some may exist in fewer numbers. "There are ecological side-effects, but the benefits (to the people) outweigh the drawbacks."

A PROJECT TO RAISE URBAN LIVING STAN-DARDS is underway in Bujumbura, the capital of Burundi in central Africa.

The first official effort to promote low-cost housing in Burundi, it is being supported by HABITAT (the UN Center for Human Settlements) with a \$15 million loan from the World Bank's International Development Association. The five-year scheme will provide better street lighting, paved streets, neighborhood schools, refuse collection services, will finance loans for house construction and improvement and will provide administrative training.

Nearly 17,000 households—a population of well over 100,000—will benefit. The project is designed to provide a model for other, similar schemes.

SOUTH AFRICA'S CABINET has stopped the quasi-state Iron and Steel Corporation (Iscor) from prospecting for coal in the country's biggest national park, Kruger Park. Iscor, however, says the nation's steel production could be jeopardized in 20 years' time when present supplies of coking coal run out—unless it is allowed to mine the park. And it has provided an environmental impact report for public perusal. Although the Cabinet stopped Iscor, it is understood that the government is considering amending the National Parks Act to allow mining and prospecting. Recently, The Star, a daily paper in Johannesburg, collected 53,000 signatures protesting the plan.

Toxics . . .

RADIO BUDAPEST reported on August 22nd that about 1,000 people have been stricken by an illness caused by contaminated water in the West Hungarian city of Nagykanizsa. It said more than 200 people were hospitalized.

Radio Budapest said that experts are still conducting an investigation into the outbreak; however, earlier radio and media reports said that the contamination was caused by sewage leaking into the water system during repairs on a water line in early August.

The radio has reported regularly since the outbreak of the illness, not only giving data on the increase of the outbreak, but warning people to observe health precautions. It noted that several sick people had left hospitals without permission and had been taken back forcibly by police. It repeated warnings that those being treated at home should not leave their homes to avoid contaminating others.

ITALIAN CUSTOMS seized 260 metric tons of mercury-polluted frozen fish aboard the Japanese ship "Seta Maru" off the Sicilian port city of Trapani.

The mackerel shark was intended for the Italian market. Shipped from South Korea, it contained a level of mercury several times above that legally allowed, authorities reported.

Two months ago, 300 tons of fish contaminated by mercury had been seized in the port city of Bari, southern Italy, aboard another Japanese ship. Earlier, 200 tons of mackerel shark imported from Japan and containing a high level of mercury had been marketed before it could be seized, in central Italy.

Italian customs have strengthened their checks on imported frozen fish from Asian countries in view of the growing shipments of contaminated products.

JAPAN'S CENTRAL COUNCIL for Control of Environmental Pollution, an advisory body of Prime Minister Zenko Suzuki, has recently submitted a report on the revision of domestic laws concerning marine environmental preservation to the Environmental Agency.

In the report, the council recommended that the agency should ban both dumping and incineration in and on the sea of wastes containing chemical products—mercury, copper, zinc, cadmium and fluorine—as well as agricultural chemicals and fertilizers. The report also made recommendations on incineration methods of all kinds of wastes including polychlorinated biphenyl (PCB). It said that PCBs should be incinerated at a point at least 92.6 kilometers off the country's territorial waters with a combustion rate of more than 99.9 percent. In addition, the report also called for the establishment of a control system for the disposal and recycling of wastes.



East African drought spreads south to Zululand

JOHANNESBURG—The searing drought down the east coast of Africa has penetrated as far south as KwaZulu on South Africa's east coast. It has left 100,000 cattle dead and most of the croplands devastated. Malnutrition has reached unprecedented heights.

Professor John Hanks of the Institute of Natural Resources in Maritzburg has pleaded with the Prime Minister's Office to consider KwaZulu and "white" Natal as one province. The government would like to see KwaZulu—about a third of Natal's area—become an independent black state, divorced from Natal. "Only by taking the holistic approach can the region (KwaZulu and Natal) survive. The drought has simply accentuated the problem of soil conservation and overpopulation," he said.

He said the crisis had been building for years and respected no boundaries. For the first time in history the cane crop died from lack of water. Half the KwaZulu sugar crop and 35 percent of Natal's sugar was killed this year.

The Zulu, traditionally a cattleman, is a poor farmer who in the past has escaped overgrazing and drought by migrating. A century ago when the British subjugated them, Zulu migrations ended but the population increase did not. Today KwaZulu (population 3 million) has a population growth of 3.1 percent a year—the highest in South Africa.

Professor Hanks, for years a wildlife management expert in Zambia and Zimbabwe, believes that if KwaZulu is forced into independence (its Prime Minister, Chief Gatsha Buthelezi, has refused independence), it will make the sharing of conservation staff, veterinary experts, and extension officers impossible. Neither Natal nor KwaZulu has adequate numbers of researchers, advisers or the finances to combat both soil erosion ("the worst in South Africa") and population problems but together the territories have a chance, he said.

JAMES CLARKE

Insecticide misuse kills wildlife in southern Africa

JOHANNESBURG—South Africa's health department has made strong pleas to the government asking that carbonate-based insecticides be banned following reports of wildlife deaths in the Caprivi Strip, east of Namibia.

The South African Army in the Caprivi Strip reported that an insecticide (a systemic poison used to protect young maize plants) was used, illegally, by poachers to smear the carcass of an

elephant. Around the elephant were six poisoned lions and 100 vultures. In another case a deliberately contaminated impala carcass was surrounded by 50 dead vultures and a dead lion. Ducks and geese were seen "staggering around" maize fields after eating young seedlings.

Complaints were also lodged with the Namibian authorities that local people were using insecticide tins for carrying drinking water. The tins were clearly marked with a red skull and crossbones and "poison" in all local languages plus the warning to puncture and crush the tin after use.

The manufacturer (Bayer) of the brand that caused the deaths believes the need is for a stricter application of the laws governing the handling of insecticides. Bayer points out that the laws are adequate but farmers disregard them by not locking up the poisons and by being careless in other directions.

The company says that carbonate-based insecticides are by far the most effective way to protect young maize and that animals eating the plants would survive the effects after some initial suffering. An elephant would need to eat 150 tons of maize to obtain a lethal dose.

The complaints are being investigated by the Department of Agriculture Technical Services. A spokesman says surveillance of stocks is to be stepped up immediately.

JAMES CLARKE

Hong Kong suspends sales of insecticides in supermarkets

HONG KONG—Major supermarkets here have temporarily suspended the sale of insecticides which the Consumer Council claims contain levels of poison dangerous to human health.

The Council reported that five locally sold insecticides contain a toxic chemical, Dichlorvos, in quantities exceeding the limit laid down by the British Insecticides Safety Scheme, 0.8 percent. The five brands are Mobil, Shelltox (red label), Tri-tox, Wipe-out, all aerosol sprays, and non-aerosol Shelltox (red label).

A Council spokesman said the insecticides are widely used in Hong Kong without public knowledge of the dangers allegedly involved. Hong Kong at present has no legislation controlling the toxic content of insecticides except in agriculture use. Meanwhile, the president of the Practicing Pharmacists Association urged the government to set a standard controlling the toxic contents of insecticides to protect public health. A spokesman of the Medical and Health Department commented that insecticides do not come under its jurisdiction.

Mobil issued a statement saying that it will investigate the alleged toxicity of its product. It said that the insecticides are made in Holland after the formula has been approved by the technical department of the company in New York. The acting Managing Director of Shell in Hong Kong criticized the allegation of the Council. He maintains that Shelltox and Tri-tox have met the requirements set by the Hong Kong Agriculture and Fisheries Department for domestic application.

SPECIAL TO WER

In Asia..

SALES OF U.S. CITRUS FRUITS IN JAPAN have dropped dramatically since the Tokyo government's Bureau of Public Health announced that tests on animals showed they were coated with a carcinogen.

Orthophenylphenol sodium (OPP sodium) is a fungicide used to keep citrus fruit from deteriorating during shipping. Since the news was published that it is a carcinogen, wholesale sales of imported lemons have dropped 50 percent, and grapefruit sales dropped 20 percent. Retail sales have also been affected.

Japanese standards limit the use of OPP sodium on citrus to 10 parts per million, half the amount set by the World Health Organization.

ENVIRONMENTAL POLLUTION IN THE ASEAN countries is worsening due to the acceleration of industrialization, says a report from the United Nations Environment Program (UNEP) and the Economic and Social Commission for Asia and Pacific (ESCAP).

It suggested that environmental improvement and strong anti-pollution measures should be included in government socio-economic planning during this decade.

THE ASEAN COUNTRIES Subcommittee on Protein has formed a working group to study the conversion of food wastes into useful products like biogas. The southeast Asian nations' group also wants to develop new techniques for battling pollution by using such means as reverse osmosis and ultrafiltration. Singapore will allocate \$187,000 to finance the projects undertaken by several institutes in the island republic.

AN INTERNATIONAL CONFERENCE on biogas technology, jointly sponsored by the United Nations Industrial Development Organization and the Chinese National Office for Biogas Development, was held recently in Beijing. The meeting was attended by experts from China and 20 other developing countries, as well as UN officials, and specialists from the Economic and Social Commission for Asia and the Pacific, and the Bremen Overseas Research and Development Association of West Germany.

THE CHINESE ACADEMY OF SCIENCES has set up a Committee to coordinate environmental research in the country. The Committee, with 32 members at present, is headed by Professor Li Su, Deputy General Secretary of the Academy.

THE SOUTH KOREAN Ministry of Home Affairs has instructed provincial governments to punish religious followers in mountainous areas who engage in acts potentially harmful to the natural environment, such as collecting stones to build altars and using lighted candles for ritual ceremonies in forests.

A RECENT SURVEY OF INDIA'S RURAL WATER supply by the World Health Organization (WHO) revealed that more than 80 percent of the rural population live without safe and germ-free water. Professor N. Majumdar, former director of National Environmental Engineering Research Institute at Calcutta, said, "the picture is indeed gloomy.'

IN VARANASI, India's holy Hindu city, about 50 participants of the Summer Institute of Environmental Studies cruised along the holy Ganges river. They collected water samples from 30 spots and found the city's sewage and effluents from the nearby industrial estate were being discharged into the river. They also saw millions of devout Hindus from different parts of the country faithfully sip the water and then bottle it to take home.

The Minister for Shipping and Transport, A. P. Sharna assured Parliament that the quality of Ganges water "is such that it always remains pure despite various things getting mixed in it." He recalled the philosophy behind the purity of the holy Ganges: "Nothing can pollute the waters of the holy Ganga. It purifies everything which mingles into it." Perhaps because of this attitude, no government action has been taken, even though the attention of the government and municipal authorities was drawn to this pollution problem a year ago.

FOR THE FIRST TIME, India's Parliament discussed the environment-for three hours in August-when the Prime Minister, Mrs. Gandhi, announced that legislation to prevent water and air pollution would be brought up after the National Committee on Environment submitted its report in mid-September.

Mrs. Gandhi assured Parliamentarians that the government was trying to subject every project proposal to scrutiny not only from the socio-economic point of view but also from that of environment. She assured them that the stress on protection of ecological systems was not at the cost of development and improvement of the lot of human beings.

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On the Subcontinent . . . | Calcutta's pollution problems overwhelm municipal officials

CALCUTTA—This city has earned the dubious distinction of being one of the most polluted cities in the world. One report says that 670 tons of pollutants are generated every day.

Though the National Environmental Engineering Research Institute (NEERI) has recommended solutions to solve the crisis, the state government has not been implementing them on the ground that "Calcutta suffers from too many ills to be tackled together.'

Citizens complain of headaches, eye irritation and respiratory trouble. According to a recent survey, over 25 percent of the student population either had or is prone to tuberculosis.

The presence of particulates in the air is mainly due to the heavy consumption of low-grade coal by domestic and industrial consumers. Industries in the Howrah belt are responsible for 90 percent of the particulate matter. The highest emission is by chemical industries, according to a NEERI study of 81 chemical

NEERI said that the situation has not yet reached a crisis point because of the vast depth and breadth of the Hooghly River. With four tides every day, "there is a natural flushing action," the NEERI report said.

NEERI has now suggested setting up an environmental board for keeping a vigil over the entire metropolitan area. The West Bengal government still has on its statute book the outdated 1905 Bengal Smoke Nuisance Act, and no steps have been taken since then to control particulate emissions to acceptable standards.

R. MURALI MANOHAR

Pakistan expands wildlife conservation measures

ISLAMABAD—The Pakistan government is moving forward on several fronts to protect its diminishing stocks of wildlife.

A Federal Council for Wildlife Conservation has been set up which includes several government ministers, provincial leaders and non-official experts. Its secretary, Abdul Malik Khattak, announced recently that, for the first time, the government had allocated Rs.5 million (\$400,000) for a national seminar on wildlife, to be held Nov. 12-14; in the past it had made a yearly token grant of \$100.

A Wildlife Act has been enacted to give comprehensive legal authority to the Council's program, and the Council is considering setting up special courts for trying wildlife violations; they have already been established in two provinces.

The Council has undertaken a nationwide wildlife survey and will soon add two new parks to its existing five national parks, 40 game sanctuaries and 65 wildlife reserves.

In addition, the Council secretary said, they have embarked on educational programs: news bulletins, documentaries, and wildlife courses on the graduate and post-graduate degree levels.

MOHAMMAD AFTAB

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Pacific islanders protest Japan's nuclear dumping plan

TOKYO—Despite protests from Pacific islanders, the Japanese government intends to continue its plan to dump 5,000 to 10,000 barrels of low-level radioactive waste in the ocean next year. A mission from the northern Mariana Islands, led by Saipan's Mayor Francisco Diza, visited Japan's Science and Technology Agency August 2 to oppose the plan. The group was in Tokyo to attend the eight-day World Conference Against Atomic and Hydrogen Bombs, which opened that day.

Minoru Honami, director of the agency's Office of Emergency Planning and Environmental Radioactivity, said that in August the Japanese government was sending a team of experts to a regional summit meeting in Guam and then on a tour of South Pacific nations to explain the dumping plans, "especially the technical aspect."

Honami said geographic surveys begun in 1972 located four possible oceanic sites for dumping the waste, the most likely being 900 kilometers southeast of Tokyo at 30 degrees latitude north and 147 degrees longitude east. "Japan is surrounded by seas, but most areas are not deep enough," he said. The most likely site is 6,000 meters deep, fulfilling the International Atomic Energy Agency's recommended depth of 4,000 meters.

At present, low-level radioactive waste is stored in 200-liter drums at nuclear power plants and related facilities, and in March, 1979, there were 213,600 drums, according to information supplied by Masaki Yokoyama of the Jishu-koza, a citizen environmental awareness group.

Delegates to the ban-the-bomb conference said that despite assurances that dumping is safe and will not affect their fishing grounds, "it is well recognized that every phase of nuclear energy is inherently dangerous."

"Dumping is being imposed on us without our consent," J. Roman Bedor of Palau said. "It is really our survival. We've been used as guinea pigs in the past," he said, referring to atomic bomb tests in the region.

Palau, part of the U.S.-administered Micronesian Islands, recently voted in favor of a constitution declaring Palau "nuclear-free," prohibiting nuclear power plants, weapons or ships without a majority vote by referendum.

In another development, the Japanese and U.S. governments have agreed to conduct a two-year jointly funded study of the health, safety, legal and environmental aspects of dumping used nuclear fuel. The first meeting was in July in Tokyo, and representatives agreed to meet again within three months, a spokesman for the Japanese Foreign Ministry said.

SPECIAL TO WER

Nuclear power...

THE U.S. AND MALAYSIA will sign an agreement in Vienna in August for the supply of a reactor and enriched uranium to the Tun Ismail Atomic Research Center (Puspati) by a U.S. firm, General Atomic, said the Secretary General of the Ministry of Science, Technology and Environment Datuk Mohamed Hashim. The one-megawatt reactor will cost \$2.3 million and be delivered before the middle of next year. The reactor will be operational by the end of 1981.

At the same time, he said, a bill to set up a National Atomic Energy Commission for monitoring activities concerning radioactive materials in Malaysia may be put forward in the next session of Parliament.

A MASSIVE LEAK of radioactive liquid in Britain's largest nuclear plant at Windscale, Cumbria, went undiscovered for several years and has led to strong condemnation of the plant's managers, the state-owned British Nuclear Fuels Ltd. (BNFL).

The leak occurred in a tank in a building which has not been in use since the late 1950s. The leak spilled over into a sump tank and from there deep into the soil. It was not discovered until last year. BNFL says the contamination is moving slowly and presents no danger to workers or the environment.

A report by the Nuclear Installations Inspectorate, published August 1st, strongly condemned both the professional judgment and the safety standards exercised by BNFL, who have acknowledged their errors and the report's fairness. In spite of this, no legal action is to be taken because of the prompt remedial action by BNFL once the leak was discovered.

A CZECHOSLOVAK OFFICIAL acknowledged that there had been an incident at a nuclear power station about five years ago that had forced the reactor to be shut down.

Milos Drahny, a member of the Czechoslovak Nuclear Energy Commission, made the disclosure during a round-table discussion over Radio Prague on August 8.

Drahny said that there had been a "disturbance" at a nuclear reactor he called A-1. This would be the first Czechoslovak nuclear generator, part of the complex at Jaslovske Bohunice in Western Slovakia. He said the reactor had been damaged but insisted that no safety regulations had been violated, that no dangerous radioactive leaks had been detected and that no employees had been injured by radiation.

In late 1978 the Czechoslovak human rights group Charter 77 claimed that there had been two deaths and radioactive pollution after two malfunctions at the Jaslovske Bohunice nuclear plant. The Prague Government denied these charges.

Brazilian nuclear plants to have ecological buffer zones

RIO DE JANEIRO—Brazil's president Joao Figueiredo has signed a decree which the government says is "an answer to those who criticize the Brazilian nuclear power program and accuse it of being a threat to our ecology." The decree stipulates that all power plants built in Brazil should be surrounded by an "ecological protection area."

Although no details have been released as to how such areas will be monitored, the government has given a full assurance that the ecological stations will be ready and functioning before any nuclear power plant actually comes on stream.

Brazil's nuclear program calls for construction of nine nuclear power plants together with a highly controversial nuclear fuel processing plant. The first of these is due to come on stream next year at Angra dos Reis, on a beautiful stretch of unspoiled coastline south of Rio de Janeiro. Construction has begun on a second plant at the same location and a site is currently being sought for a third plant. Two more plants have been approved on the Sao Paulo state coastline, a decision which sparked off massive ecological protests.

The Figueiredo government has said that the new ecological stations will occupy the entire area appropriated by the state to build these plants with the exception of the actual space needed for construction. As far as Angra dos Reis, where construction is well advanced, the dimensions of the area covered by such environmental protection remain to be defined.

The whole nuclear power program in Brazil has been lashed with criticism by economists and environmentalists alike. Already, costs have rocketed above original estimates. At Angra, originally estimated costs of \$510 per installed kilowatt have soared to \$2,000 per kw, and building time exceeded by over three years. For Angra II and III, estimated costs are already hitting \$2,600 per kw, and construction costs revised upwards from \$1.3 billion in 1976 to \$3.1 billion today.

Further delays in the program are now expected following a 15 percent cutback in the spending budgets of state companies. The original total estimated budget for the Brazilian-West German project was estimated at \$7 billion. Latest figures suggest a total cost of \$35 billion, and the project completion date has been put back five years to 1995. But in announcing these new and somewhat amorphous plans to protect the environment, the government believes it has countered environmental objections so that the nuclear program can continue.

GEORGE HAWRYLYSHYN



India will build a refinery near the historic Taj Mahal

NEW DELHI—The government of India is now determined to complete construction of an oil refinery near the Taj Mahal at Agra, and environmentalists have lost their final battle (WER, Nov. 20, 1978, p. 1; July 2, 1979, p. 4; July 16, 1979, p. 8).

Professor J. N. Dave, an eminent environmental scientist at New Delhi's Jawaharlal Nehru University, expressed serious doubts about the effectiveness of the anti-pollution safeguards being built into the Mathura Oil Refinery to protect the Taj and other historical monuments nearby. He said that the proposed pollution monitoring stations should not be supervised by the Indian Oil Corporation, which will operate the refinery. He suggested that the task of monitoring pollution should be entrusted to an independent organization.

Som N. Chib, Vice President of the newly formed Indian Heritage Society, deplored the government's decision despite protests by various environmental scientists.

Environmentalists have stopped lobbying for shifting the refinery to another site as enormous sums have already been spent on it. But they do stress that safeguards should be strengthened to save the Taj from being eroded by toxic emissions.

A team of quality control engineers connected with the Mathura Oil Refinery has claimed that there is no immediate danger or threat to the beauty of the inlaid marble of the Taj, but they have promised that after the refinery is commissioned a fresh study will be undertaken to ascertain the extent of pollution.

R. MURALI MANOHAR

Despite opposition, Bombay gets a massive power plant

BOMBAY—India's second biggest industrial group is planning to put up a second massive thermal plant near Bombay where their existing power station has helped create India's most polluted area.

When the Tatas proposed building a 500-megawatt thermalunit at Trombay around 1972, bodies like the Society for Clean Environment (SOCLEEN) protested because, they said, the coal burned at the plant would release tremendous quantities of sulphur dioxides and nitrogen oxides into the atmosphere. Nevertheless, the Tatas' proposal was approved for two reasons: the overwhelming need for more power in the city, which is the country's leading industrial center, and assurances from the promoters that they would install anti-pollution devices and use low-sulphur coal or natural gas as fuel.

The first unit, estimated to cost around \$160 million—\$100 million of it loaned by the World Bank—is expected to be completed in 1982. Now the Tatas have asked for permission to

Energy sources ...

WORK WILL START within a few months on the Soviet Union's first solar power station.

A power industry official said that the new station, to be constructed in the Crimea, will have a capacity of five megawatts—equal to the generating capacity of the USSR's first nuclear power station at Obninsk near Moscow.

A Comecon meeting held in Prague recently was dominated by the issues of fuel and raw material supplies. A communique at the end of the session stressed the need for closer cooperation in finding new energy resources.

THE THIRD WORLD HYDROGEN ENERGY Conference was held in Japan recently. About 450 hydrogen energy experts from 30 countries participated, the Japan Times said. Among the topics discussed were vehicles and hydrogen combustion, and the industrial aspect of hydrogen energy. The conference was presented by the International Association for Hydrogen Energy (IAHE).

HYDROGEN-POWERED CARS, said to be the world's first, are to be produced in Queensland, Australia. The cars were developed by Sydney engineer Stephen Horvath.

The car system consists of a 40,000-volt current passing through a hydrogen-filled chamber. The hydrogen is mixed with air fed into a modified manifold inlet and compressed. Fusion changes the hydrogen to helium, and a spark plug burns off the excess energy.

MEMBER COUNTRIES of the International Standards Organization (ISO) in Geneva have agreed to set up a solar energy secretariat in Sydney, Australia, to be run by the Australian Standards Association. The basic task of the secretariat will be to develop standard methods for testing solar energy equipment such as hot water heaters, salt extractors and air-conditioning plants. It will also examine the Australian code for the construction, installation, and testing of hot water heaters.

REPORTS assembled by the UN Economic Commission for Europe (ECE) on new ways of producing and using energy have just been published in book form.

According to an ECE spokesman, it would be invaluable to those with limited technical knowledge, since it is a source of authoritative, unbiased and up-to-date information. It would also be of interest, he said, to environmentalists, ecologists, planners and administrators in government, and to research institutes concerned with energy.

"Environmental Aspects of Energy Production and Use with Particular Reference to New Technologies" is published by the Pergamon Press. The 116-page book sells for \$15.

Renewable energy...



A JAPANESE TANKER-CARGO SHIP, fitted out with sails and a waste-fuel recycler, has been launched in southwestern Japan.

The 699-ton Shin-Aitoku Maru, owned by Aitoku Co. of Tokuyama, is expected to make regular runs beginning in September between Japan, China and Southeast Asia.

The ship is 66 meters long, with a micro-computer to adjust the two 12-by-8-meter sails according to wind velocity. Improved hull design and the waste-fuel recycler make for half as much fuel consumption, according to reports. The building cost was 530 million yen (about \$2.3 million), an estimated 100 million yen more than it would cost to build a ship of similar size,

but the saving in fuel is expected to recover the difference in two or three years.

ENEL, the Italian state-controlled electric power company, is building a wind-power test plant on the island of Sardinia.

Energy will be produced by a Fiat-made propeller, with a diameter of 15 meters, operating a big dynamo. The cost of the plant was estimated at 100 million lire (\$120,000). Operating expenses are expected to be minimal.

On the basis of the energy produced by the test plant, Enel will decide whether to build others in Sardinia and on the mainland. Meanwhile, a country-wide map of winds is being prepared by Enel technicians.

A PROJECT TO DEVELOP a vertical axis wind turbine has been given £450,000 (1,057,500), or 80 percent of its cost, by Britain's Department of Energy as part of its wind-energy research sponsorship.

Its inventor, Dr. Peter Musgrove of Reading University, believes that, successfully developed, a system of turbines could provide one-fifth of Britain's electricity demand by the year 2000. He envisages 2,000 windmills in groups of 200, placed on strategic sites offshore.

The advantage of a vertical over a horizontal axis is that it can accept the wind from all directions. This design is unique in that its blades furl according to the strength of the wind. It has blades 25 meters in diameter and an output of 130 kilowatts.

The project is to be carried out by a consortium which will provide 20 percent of the cost.

erect a second plant of the same size (the biggest in the country) at Trombay, where a state-owned fertilizer factory and two oil refineries in the adjoining area of Chembur (WER, Feb. 25, p. 7) already create health problems for residents.

SOCLEEN has claimed that each plant will add 101 tonnes of sulphur dioxide and 55 tonnes of nitrogen oxides to the existing pollution. The Tatas say that the coal will only have a sulphur content of 0.4 percent and have sought the advice of U.S. consultants in installing flue gas desulphurization equipment. As far as natural gas from the Bombay High off-shore venture is concerned, however, the thermal units will have only limited access to supplies because it is more economical to use it for fertilizer and petro-chemical plants.

Each 500-megawatt plant will need 1.35 tonnes of coal a year: Together they will consume almost as much as all Bombay's existing industries do. Besides, the transport of such huge quantities of coal to midtown Bombay, which is a narrow peninsula, poses immense problems.

The Bombay Environmental Action Group suggests that the second thermal unit be shifted 600 miles away, to Chandrapur in Maharashtra state's coal belt where the State Electricity Board is already erecting a thermal station. The power loss in transmission, they say, would be far less than the cost that will be extracted from Bombay's beleaguered citizens, particularly in Trombay-Chembur, where respiratory ailments have shown an alarming rise in recent years. Another possible site is along the pipes that the government is laying to carry Bombay High gas to the north of the country to chemical plants.

DARRYL D'MONTE

Pakistan to propose energy management legislation

ISLAMABAD—Pakistan's new National Energy Policy Committee will propose energy management legislation to prevent wastage in all sectors of industry, transport and at home.

Sohail Quershi, committee secretary, said that deterrent measures in the draft legislation should conserve at least 30 percent of the energy now wasted.

Meanwhile, the committee is moving ahead on measures to tap renewable sources of energy. In August, a three-year \$3.8 million project was launched: 1,100 biogas units to provide gas and electricity to 159 villages. The energy generated from these units should replace four million liters of kerosene each year, saving over \$800,000 annually in foreign exchange. Initially, 25 percent of the cost of these biogas plants will be in foreign exchange to import machinery—generators, valves, compressors and heat pumps. Eventually, all parts will be fabricated locally.

The committee also hopes that the European Community will provide \$1.5 million for Pakistan's solar energy program. The money will be used to set up three pilot projects producing from five to 35 kilowatts per hour.

MOHAMMED AFTAB

Ireland finds oil companies culpable in tanker disaster

DUBLIN—The French oil company, Total, and the American company, Gulf Oil, have been severely criticized by an Irish tribunal which investigated the Betelgeuse oil tanker disaster in Bantry Bay on January 8, 1979. Fifty people died in a massive explosion that blew the ship apart.

The report is believed to be one of the strongest condemnations

of multinational oil companies ever published.

The tribunal found that Total did not properly carry out repairs and servicing of the tanker because they wanted to sell it. Total has

rejected the findings.

Total insisted that the fire which led to the disaster started on the Gulf jetty, but the tribunal finds otherwise and claims that due to a ballasting error aboard ship its corroded center section buckled, releasing the gas that exploded. Justice Costello found that lives could probably have been saved if Gulf Oil escape and safety procedures had been better.

The tribunal also found that a Gulf Oil dispatcher was not at his control post as he claimed and that he and other employees tried to mislead the tribunal about the time of the disaster, claiming it at 12:55 p.m. when eyewitnesses elsewhere clearly established it at 13 minutes earlier. The tribunal stated Gulf Oil employees and management fabricated the story, altered log books to "coverup," and prevailed on a local telephone exchange to back up their story with inaccurate timings.

Some proceedings arising out of the disaster have already been set in motion in courts in America and England, but one of the most important legal battles will be in the High Court in Dublin before the end of the year, where Gulf and Total are claiming

against each other.

In an indictment of Gulf management, Justice Costello commented in his findings: "Instead of gathering as much information as they could they contented themselves with statements they obtained from their employees and took active steps to ensure that this evidence, highly favorable to their own financial interests, was not weakened in any way by official inquiries. They were anything but assiduous in seeking out the truth of the events of the disaster."

As a result, the Irish government said it would arrest tanker captains whose ships were found in unsafe condition. And European Community Transport Commissioner Richard Burke proposed rules to both tighten surveillance of ship maintenance and provide a computerized record of each ship's operating history. As a result of the tribunal's findings, it is likely that these rules will be agreed upon by the EC's Council of Ministers this November. But the real necessity for tanker safety, which will mandate seaworthiness certificates for each ship, requires ratification of the 1978 protocol to the Safety of Life at Sea (SOLAS) Convention. So far, only 11 nations have signed of the 15 required for ratification.

TOM MacSWEENEY

Ocean management . . .

IN SPITE OF THE DECLINE in the numbers of oil tankers passing around South Africa's Cape Coast (40 percent of Middle East oil to the United States rounds the Cape) oil spills are still causing concern. Professor John Day, University of Cape Town, said that 35,000 tons of oil are spilled along the coastline annually and 15,000 of that is the result of illegal tank flushing at sea.

One of the problems, according to Dr. Ian Berry of the Oceanographic Research Institute in Durban, is that the empty tankers fill up with sea water to make the passage round the Cape less uncomfortable. As they reach the subtropical regions off northern Natal they pump the sea water out and with it comes oil.

Sea birds are most threatened by these illegal discharges. Also threatened are turtles—four species of them—which lay their eggs along the oil-gob infested coast. Of a batch of exactly 100 observed hatching, not one reached the sea, for they got caught in the oil and were eaten by predators.

IRELAND'S ONLY VOLUNTARY MARINE research station is to close down because of lack of government finance.

The Sherkin Island research station opened in 1975 and distinguished itself in its investigations of the Red Tide. It was from Sherkin that the state got its only information on the organism, which kills oxygen in water.

In five years' operation, costing an estimated £20,000 (\$42,600) annually, the State has given only £2,500 and offered only another £4,000. The family concern, run by Matt Murphy, raised funds by running an outdoor pursuits center on the same island, and this is to continue.

Eighteen biologists, from Australia, Switzerland, Britain and Ireland, who had worked voluntarily at the station, are to return home. The Cork County Council has condemned the lack of government help.

HONG KONG OFFICIALS HAVE REFUSED to reveal figures of the twice-monthly count of bacteria levels at beaches. A spokesman for the Urban Services Department said that the findings might cause a panic among the public. He insisted the department would know "a long time before" the bacteria level reaches the danger point.

It has been suggested that the bacteria level at beaches exceeds the maximum safety limit set by the World Health Organization of 1,000 coliforms per 100 milliliters. Instances of coliform counts as high as 92,000 have been discovered in Hong Kong harbor. The coliform count, dated as far back as 1972, for Repulse Bay beach was 50,383, while the figure for Shek O beach was 59,000.

Wildlife...

THE SIXTH AFRICAN WILDLIFE Conference, held in Nairobi and attended by delegates from almost all African countries and from international organizations, called on African states to adopt all the conservation principles outlined in the new World Conservation Strategy (WER March 10, p. 1), and also to implement specific new conservation schemes of their own.

A conference resolution says African states should give priority to developing comprehensive land-use plans, incorporating wildlife conservation into wider development projects.

Reviewing environmental pollution considerations in wildlife management, Dr. Shem O. Wandiga, of Nairobi University, said that in Kenya (and in most other African countries), pollution was less of a threat to wildlife than soil erosion resulting from population pressures.

Jimoh Omo-Fadaka, of Nigeria, warned that national parks and nature reserves will not succeed in ensuring the survival of wildlife if they are "imposed" on African society. The answer lies in ensuring that nature conservation accords with African culture, and does not conflict with the life of the people.

A THREE-YEAR BAN on hunting, trapping and exporting wildlife in Pakistan has been proposed by the National Council for Conservation of Wildlife because of its concern at the decline in the wildlife population. The Council has also sanctioned money for surveys, research and education on wildlife conservation.

The Council decided to establish a national park in the Neelam and Kaghan valleys of northern Pakistan to preserve some of the rarer species like muskdeer, snow leopard and high-hill pheasants.

WILD GAME could produce more red meat per unit area of land in certain areas than cattle or sheep, says Dr. W. M. O'Donovan, a South African veterinarian.

He said game, if farmed efficiently, matured far more quickly than domesticated animals, and they started reproducing at a very young age. Other research has shown that the indigenous eland (antelope) can reach a marketable weight in conditions in which a steer would starve to death.

Research on the use of marginal bush country for wildlife conservation and utilization as a protein source is being carried out by the Mammal Research Unit at the University of Pretoria under the direction of Professor John Skinner.

International whaling meeting was harpooned from all sides

LONDON—What some feared might be the last annual conference of the International Whaling Commission (IWC) opened in Brighton, England, on July 21st.

Japan, responsible with Russia for around three quarters of all commercial whaling, was threatening to withdraw and found a rival group if the proposal for a moratorium on commercial whaling was carried by the IWC. Other members would possibly walk out if Taiwan, whom they do not recognize, became a member.

But the proposal to ban commercial whaling did not receive the necessary three-quarter majority (the vote was 13 to 19), and after some very late night sessions, compromise quotas for the various species were agreed upon for the following year, with satisfaction to neither side and little glory for the IWC.



Quotas for sperm whales were lowered compared with last year, from 273 to 130 in the North Atlantic, from 1,350 to 890 in the North Pacific and from 580 to 300 in the Southern Hemisphere. The Minke quota was raised by 11 in the North Atlantic, lowered by 280 in the Southern Hemisphere and remained constant in the North Pacific. In compensation, quotas on the smaller Fin and Bryde were raised.

The Commission rejected by 8 votes to 7 a ban on the killing of the Bowhead whale, the species of great whale most in danger. This is a central part of the Eskimo diet, and the overall quota was finally dropped by one from 18 to 17.

Quotas for 1981-82 total almost 14,000, which does not take account of illegal whaling to which conservationists draw attention and over which the IWC has no effective control.

Japan, the only country which consumes whale meat as well as whale oil, demands the restitution of her traditional whaling trade. Both sides question the scientific data on numbers and breeding patterns on which the quotas are based. Whalers believe these over-protect whale species to their own economic ruin. Conservationists think the evidence shows that nothing short of a ban in killing will protect many species, so that even a standstill on quotas at this conference means destruction of some species.

This year conservationist groups such as Friends of the Earth, Greenpeace, World Wildlife Fund, Project Jonah and Sea Shepherd Fund joined with the International Union for Conservation of Nature to provide a united front to pressure the IWC.

In Europe the EEC, instigated by Britain, is pushing for a ban on the import of all whale products by 1981. Whether this kind of momentum will gather swiftly enough to save the whale is something conservationists doubt. Greenpeace and Sea Shepherd have announced their intention of continuing to use their own ships to interfere with the activities of pirate whalers. Sea Shepherd is particularly incensed that Canada, a non-whaling nation, voted with Japan against the moratorium this year, and is asking their members in Canada, the U.S. and the United Kingdom to boycott Canadian products.

The 33rd annual meeting of the IWC will be held in Brighton in July next year.

BARBARA MASSAM

Eco-protection doesn't cause inflation—it can stem it

NAIROBI—The worldwide recession has led to an outburst of complaints against environmental controls. The argument, especially in developed nations, is that government regulations, particularly anti-pollution measures, are reducing industrial productivity and increasing manufacturers' costs. It is argued that environmental protection has become a major source of inflation. Yet environmentalism could represent a major means to resist inflation.

For the first time, inflation has hit virtually all economies of the world at once. Milton Friedman and the monetarists apart, a good part of the problem lies with past overexploitation of natural resources. We have hacked down forests to produce "cheap" timber, we have over-grazed pasturelands in order to grow "reasonably priced" meat, we have over-cropped farmlands in order to produce bread and other staples at "fair" prices, and we have over-utilized other natural resources in order to keep general living costs down.

We have not so much used our natural resource base as abused it. Far from drawing on the sustainable "interest" of renewable resources, we have been consuming more and more of the capital stock. Now the bill for our past prodigality is being presented. Yet we still demand ever-greater quantities of material goods from ever-declining resources. This is a blueprint for building inflation ever-deeper into the economies of modern societies, whether marketplace or centrally-planned, whether advanced-world or developing-country.

During the past decade we have been failing to produce enough of several key commodities for each citizen of the global village—cereals, meats, fish and wood, as well as the prime commodity whose scarcity everybody is aware of, petroleum. During this same period, the prices of these commodities have burst through one ceiling after another. The result is worldwide inflation.

The core factor is that in the past we have considered that cheap raw materials—not just energy but a variety of commodities—could be taken for granted, hence they have tended to be undervalued. At the same time, certain economists have been inclined to apply conventional measures to marketplace output, and to overemphasize money and trade to the detriment of our

International cooperation ...

ENVIRONMENTAL REFERENCE CARDS in French are available free to WER readers in developing countries. They are published by the Conseil International D'Education Mesologique des Pays de Langue Française (CIEM) with support from the UN Environment Program. So far, 50 cards have been produced covering the following areas: environmental education; concepts, principles and theories; problems; solutions; case studies; research; news briefs; organizations, centers and institutions; conferences and meetings; reviews, bulletins and other publications; bibliographies, book criticisms, reports and documents. CIEM expects to have 100 cards by the end of this year, and the project will continue expanding. To receive them write: CIEM, C.P. 39, Sillery, Quebec G1T 2P7, Canada.

U.S. AMBASSADOR Mike Mansfield and Japanese Prime Minister Masayoshi Ito exchanged documents in Tokyo August 5, extending through 1985 a treaty concerning bilateral cooperation in environmental fields.

Under the five-year agreement, experts will hold annual meetings to discuss environmental protection, government policies and pollution problems, such as car exhaust fumes and smog, spokesmen said.

POLISH AND U.S. experts met in Washington in June to review eight years of cooperation between the two countries in environmental protection projects.

Polish-American cooperation dates back to mid-1972 and is based on an agreement specifying forms of cooperation in: development of joint scientific and technological research; exchange of specialists and scientific-technological information; joint conferences and symposia; and access to research equipment.

Thus far 21 projects have been carried out and an additional 19 are underway, the Polish news agency said. Five agreements have been signed for new research projects covering such areas as utilization of water reserves, exploitation of copper resources and production of copper products.

AN INTERNATIONAL SYMPOSIUM on Water Supply and Health will be held at Noorwijkerhout, near Amsterdam, August 27 to 29. Organized by Dutch, American and British government agencies, the symposium will present the main results of a NATO drinking water pilot study and studies relating to the health aspects of drinking water components, specific treatment processes and new strategies for water systems design.

Books & booklets...

CONCERNED ABOUT THE DESTRUCTION of tropical vegetation, the U.S. National Research Council in 1977 established a committee of scientists to determine the kinds of research needed to halt this destruction and to then set research priorities. The committee was international, and the booklet they have just published as a result of their work summarizes the situation and makes recommendations for research. Because of the need for world-wide action, "Research Priorities in Tropical Biology" is published in English, French, Portuguese and Spanish. It is available from the Office of Publications, National Academy of Sciences, 2101 Constitution Avenue, Washington, D.C. 20418, U.S.A.

THE UN CENTER FOR HUMAN SETTLEMENTS (HABITAT) has prepared a series of directories of institutions, organizations and individuals involved in the housing field.

HABITAT is also promoting the sale of a number of publications, published by other bodies, relating to human settlements. Subjects range from low-cost construction to withstand earth-quakes and hurricanes to the role of housing in promoting social integration.

Further details are available from the Information Division, UNCHS (HABITAT), P.O. Box 30030, Nairobi, Kenya.

THE OECD, Organization for Economic Cooperation and Development, has just published several booklets of interests to WER readers. They are:

- Environment Policies for the 1980s,
- Pollution Charges in Practice,
- Water Management in Industrialized River Basins, and
- The Impact of Tourism on the Environment.
 A report published last year may also be of interest: Environmental Impact Assessment.

They can be bought (usually for around \$4) from OECD sales offices in major capitals, or from the main office: OECD, Publications Office, 2rue Andre-Pascal, 75775 Paris Cedex 16, France.

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real wealth in the form of earth's natural resource base. As a consequence of miscalculating "profits" without taking into account all extra costs, the many external variables that economists label "inflation" are coming home to roost.

Inflation of this nature and scale cannot be tackled through traditional monetary measures and fiscal tools. For human communities seeking a better life, there is a single conclusion: Environmental management and economic advancement are inseparable.

NORMAN MYERS



Pollution prevention can pay companies big cash dividends

NAIROBI—Pollution prevention is not a waste of money. In many cases it pays big cash dividends.

Dr. Michael Royston, a British chemist and environmentalist has discovered scores of cases where large and small companies have made profits out of countering pollution in their plants.

Dr. Royston is faculty member in environmental management at the Center for Education in International Management, Geneva, Switzerland. He has written a book, "Pollution Prevention Pays" (Pergamon Press) based on the results of research carried out for the UN Environment Program (UNEP) on the economic benefits of investing in pollution control.

Interviewed by WER at UNEP headquarters here, Royston cited 3M, AMAX, Union Carbide, Dow Chemical (in the U.S.), Imperial Chemical Industries (in Britain) and Krupp (in West Germany) as companies who have demonstrated how profits are made from using or recycling what were formerly regarded as waste materials.

In one case, he says, a Scottish whisky distillery realized that the grain husks and other materials which were being thrown away (and creating a pollution problem) could be dried and turned into cattle feed. In one year, the company made a profit of \$1.5 million from the sale of these materials.

A French oil refinery found it would cost over \$500,000 a year to dispose of waste hydrocarbons. But after investing \$2.5 million in a processing plant, they now make \$1 million profit each year on the recovered products.

Royston points out that the pulp and paper industry is one of the biggest polluters. But Canadian experts have developed a totally clean pulp mill costing only 5 percent more to build. Because it recycles its water, chemicals and waste fibers, it costs 5 percent less to operate.

Royston says most universities in the industrialized countries already emphasize the economic values of pollution control. But technical schools in developing countries are moving slowly. "They should spend more of their effort on pollution control. The message I have tried to get across is that curative measures in environmental management are expensive—and prevention is cheaper than cure."

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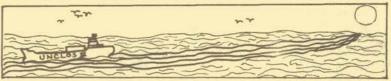
South African officials and army officers are accused of hunting illegally in game-rich Namibia 8 1 4 AUG 1980

Environmentally, the Law of the Sea charts a good course

NEW YORK—"The environmental achievements of the Third U.N. Conference on the Law of the Sea are not insignificant," writes Jan Schneider, a lawyer who has been observing the negotiations for the UN Environment Program.

A decade ago, when negotiations began in the "Seabed Committee," there was almost no international law to protect and preserve the marine environment. Since then, she writes in her report to UNEP, through negotiations and "symbiotic developments in other arenas, nations have slowly and somewhat fitfully been groping toward workable compromises...within an overall comprehensive 'package' of provisions for the new Law of the Sea."

Now that the environmental components of the Law of the Sea are virtually complete, "the greatest part of the work of elaborating and implementing the new regime remains before states and concerned environmentalists, but," Ms. Schneider asserts, "UNCLOS III has charted a good course on which to embark."



How far has UNCLOS III come toward acceptance of the idea of ocean management and the general environmental obligations of states?

UNCLOS says states have "the obligation to protect and preserve the marine environment." Although the sovereign right of exploitation is recognized, signatory nations will be committed to "take all necessary measures...to prevent, reduce and control pollution of the marine environment from any source," using the "best practical means" available.

In subsequent provisions, nations also agree: not to transfer damage or hazards from one area to another or to transform one type of pollution into another; to promote and develop contingency plans for responding to pollution incidents; to cooperate in establishing appropriate scientific criteria for the prevention of marine pollution; and on the need for scientific and technical assistance to developing states.

For the first time, states will be legally responsible for cooperation on marine environmental monitoring programs—assessing potentially threatening activities and reporting publicly the results of their assessments.

Environmental legislation . . .

CONSERVATIONISTS LOST a two-year fight when Norway's Storting (Parliament) recently approved plans to develop the Alta-Kautokeino watercourse in northernmost Norway for hydroelectric purposes.

The Storting had debated the matter twice before and on both occasions voted for development in accordance with the proposal from Prime Minister Odvar Nordli's government. This time the vote was 96-31.

The development plan collided sharply with conservation and environment interests in the area. Several groups of Lapplanders also opposed the plan.

Last summer there were violent demonstrations and clashes with police when demonstrators staged sit-down actions to prevent initial road construction work along the river.

NEW ZEALAND'S new National Development Act strengthens the role of the nation's Commission for the Environment. An environmental impact report on any major government or private project must now be submitted to the commission. The commission must promptly deliver an environmental audit of the project and then present its case before the country's top-level Planning Tribunal.

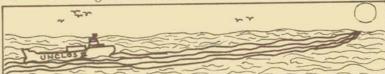
THE DRAFT AMENDMENT of the Thai Forest Act will be completed by the end of July, said a source in the Forest Department. Earlier, the department submitted the amendment to the Agriculture and Cooperatives Ministry for approval. The amendment authorizes the Forest Department to investigate cases concerning forest poaching and deforestation. It also authorizes department officials to impose heavier penalties on forest poachers as well as to confiscate equipment used in poaching within 24 hours.

CHILE HAS IMPOSED severe air pollution sanctions on privately run public transportation companies in the capital city of Santiago. Beginning in early August, those buses and collective taxis that continue emitting toxic gases above permissible limits will be removed from circulation. The measure was taken by the military governor of the Santiago metropolitan region, General Rolando Garay.

Currently, vehicles found exceeding permissible levels by either national police or ministry of transport officials, are fined between \$50 minimum and \$400 maximum. Santiago, in an enclosed basin, is highly contaminated, particularly this time of year, the southern hemisphere's winter months.

In the past 20 years, the number of ships plying the world's oceans has nearly doubled. The escalating problem is not just hydrocarbons; in the last two decades container ships, chemical and gas carriers have joined the world fleet, many carrying potentially dangerous cargoes.

Several international treaties and agreements already exist covering ship-generated pollution and dumping. UNCLOS adds to them. First, in the territorial sea, coastal states may exercise their sovereignty to establish antipollution laws and regulations. This recognizes the right of port states to establish antipollution requirements as a condition for entry of foreign vessels. Second, in the 200-mile exclusive economic zone (eez), they can prevent dumping and may establish other laws and regulations conforming with international rules and standards. And third, there are provisions for "special areas" within the eez for particularly sensistive ecological conditions.



Shipping accounts for only about a third of all marine pollution; the balance comes from other sources—land-based, seabed activities, dumping or through the atmosphere. Ms. Schneider observed that "while the articles drafted at UNCLOS III do not advance the substance of environmental law dealing with land-based sources dramatically, they do at least raise this critical problem to the level of a recognized area of broad international concern."

"There are certain areas," she notes, "where international law...is patently defective or virtually nonexistent...as the Amoco Cadiz, Ixtoc and other accidents have so dramatically demonstrated."

Few treaties or international agreements deal with pollution from exploration or exploitation. The Ixtoc-1 blowout in the Gulf of Mexico demonstrated the need for better contingency planning, preventive measures, and provisions for reparation and compensation. The UNCLOS standard-setting article provides that states establish not only national laws and regulations but also global and regional ones. While the UNCLOS language lacks specificity, these provisions "are at least a step forward," she writes.

As to deepsea mining, an article specifies that "necessary measures shall be taken to ensure effective protection for the marine environment, and, to that end, the (International Sea-Bed) Authority shall adopt appropriate rules, regulations and procedures."

Another major concern of the negotiators has been the conservation and improved utilization of living resources. Acceptance of the 200-mile eez gives states both economic incentives and sovereignty (i.e. political power) to realize these goals.

Many of the draft articles contain references to "generally accepted" or "applicable" international rules and standards. But, as Ms. Schneider points out, "It has not, however, been established just what these terms mean and to what norms states are to be bound."

Law of the Sea negotiators have come up with an elaborate system for the settlement of international disputes. If a state is alleged to have contravened specified rules, it is subject to detailed settlement procedures. If it has failed to comply with its obligations in regard to living resources, it must go to compulsory conciliation procedures. Arbitration is provided for disputes relating to fisheries, marine protection, scientific research and navigation.

"At present, many of the potential improvements remain largely paper gains, still to be implemented and realized in actual practice," Ms. Schneider asserts. She believes that "the first major task for concerned environmentalists should be to exert their best efforts to ensure ratification and entry into force of the UNCLOS III convention itself."

Although the environmental aspects of UNCLOS III are "not all that would have been desired from the environmental perspective," she concludes that the treaty does "represent a major step forward in the progressive development of international environmental law," but only if environmentalists give it their active support so that adequate norms and standards can be implemented.

Final negotiations on the draft convention are scheduled to start today in Geneva and last for one month—leading to a treaty some time next year.

LIBBY BASSETT

Several studies are underway on Mexico's Ixtoc-1 oil spill

MONACO-It will take eight years to determine the damage done the Atlantic Ridley sea turtles by Mexico's Ixtoc-1 blowout.

To minimize the threat of extinction which the spill posed, the Mexican government airlifted about 9,000 turtle hatchlings to a patch of sargassum within 25 kilometers of the shore. In 1987 the adults born in '79 will return to the beach near Rancho Nuevo to

lay their eggs and, it is hoped, continue the cycle.

The Ridley turtle is only one of several endangered species affected by the June 3, 1979, blowout which over nine months discharged 140 million gallons of oil into the Bay of Campeche. Its environmental effects are under study by several organizations including the U.S. National Oceanic and Atmospheric Administration (NOAA), the Mexican Petroleum Institute, the Universities of Mexico and Texas, the U.S. National Park Service, and the United Nations Environment Program (UNEP). Neither the U.S. nor Mexico, however, has funded a comprehensive study of the Ixtoc-1 spill, and disputes such as that between NOAA and the Bureau of Land Management (BLM) have hampered a study of its overall damage.

In Latin America ...

WHEN THE LAW OF THE SEA Conference ends, and the new regime which will govern undersea exploration is finally established, Chile may be one of the first nations to permit ocean bottom exploration within its 200-mile economic zone.

Earlier this year, Chilean government officials established contact with officials of several private foreign firms that wish to begin such exploration. Most likely, such activities would take place within 200 miles of the Chilean-held Juan Fernandez (Robinson Crusoe) Islands, in mid-Pacific. The firms which have made contact with the Chileans are Kennecott Joint Venture, Ocean Mining Associates, Ocean Minerals Co. and Ocean Management, Inc.

THE GUYANA GOVERNMENT has signed a \$75 million contract with a Dutch firm, Ballast and Ledein, to construct a water control dam, canals, drainage trenches and pumping station for the Mahcica-Mahaicony-Abary flood control and land reclamation project. The northeastern Guyana project is funded by the Inter-American Development Bank. According to an IADB source, the environmental impact study by William Halcrow & Partners determined that the project would produce no significant detrimental environmental effects.

In addition to flood control for nearly 57,000 hectares, the three-and-a-half-year project will create 21,500 hectares of rice-growing land.

VENEZUELA'S AGRICULTURE is in a state of "near abandonment," according to concerned agronomists such as Juan de J. Montilla, a research and planning specialist.

He points out that in Latin America Venezuela is the country which sows the least land per inhabitant-1,400 square meters. Cuba cultivates 4,088 square meters per inhabitant and Argentina 10,907 square meters. Despite the advantage of a high proportion of 12.49 tractors per thousand hectares, the Venezuelan farmer only cultivates an average of 2.01 hectares a year. Argentina and Chile, with 7.63 and 4.93 tractors for the same area, cultivate 9.11 and 7.35 hectares per farmer.

It would appear that the excellent national road system, insted of bringing progress to the countryside, has favored emigration of farm workers to the cities. Rural population now accounts for less than a quarter of Venezuela's population. As a result of declining interest in farming, Venezuela depends heavily on imported foods, including staples such as beans and powdered milk.

In Africa...

ARAB-ISRAELI POLITICS has delayed construction of the UN Environment Program's new headquarters near Nairobi. Arab countries strongly protested the decision to grant the building contract to an Israeli firm which had submitted the lowest bid. The \$22.2 million contract with Solel Boneh was then withdrawn.

UNEP Executive Director Mostafa K. Tolba (who is an Egyptian) proposed that the scheme be revised to delete the conference facilities incorporated in it. This has now been agreed, and tenders for the new (reduced) scheme are likely to be invited early in 1981.

New specifications for the UNEP headquarters project will now be prepared for review by the UN General Assembly in September.

The U.S. has protested against the move to bar any member-state of the U.N. from the contract, and has threatened to withdraw its financial support from UNEP if the principle of the lowest bid is not followed.

Solel Boneh operates in several African countries, and it is charged they operate in South Africa. Its manager in Kenya, Joseph Maoz, said the firm probably would submit a new bid for the revised scheme.

RWANDA, one of the poorest and most densely populated countries of the world, is embarking on an integrated forestry and livestock development project. The \$23.6 million project (\$21 million is from the World Bank's International Development Association) will establish 8,000 hectares of fuelwood and pole plantations in the southern Kigali and Butare prefectures. An integrated forestry and livestock scheme covering 4,000 hectares in the Gishwati Forest will also be set up to provide timber and improve the cattle industry.

In addition, studies will be made on this central African country's energy needs, and on charcoal-making and the development of economical cooking stoves.

Without such a program, all Rwanda's trees would be gone in 10 years, a World Bank source said.

AS MANY AS 10 PERCENT of the earth's flowering plants are in danger of being lost forever, according to London's Kew Gardens. And many of them are in the world's richest flowering area, the Cape Floral Kingdom in the south of South Africa.

The S.A. Nature Foundation (affiliated to the World Wildlife Fund) is pushing for tougher legislation to protect the region with its huge variety of proteas and ericas (heaths).

The Foundation points out that every plant that becomes extinct can take with it up to 30 dependent species—insects, animals and other plants.

Despite the presently incomplete assessment of the environmental damage caused by Ixtoc-1 blowout, some indication of its effect has already been made, say researchers Richard S. Golob and Daniel McShea in a paper presented at the International Conference on Pollution and the Marine Environment held recently in Monaco.

Along the Texan and Mexican coasts, fishing has been poor with catches down as much as 80 percent. Stormy weather, which kept fishermen on shore, and the move to new feeding areas forced on sea life by the oil spill may have been partly responsible for the reduction in local catches. Fishermen in some parts of the Gulf—east of Progresso, for example—caught far more octopus and fish than usual, possibly because sea life had fled north and east to escape the oil. To help restore more nearly normal conditions, Mexican authorities banned fishing along the coast for 90 kilometers north of Tampico and restricted it along affected coastal areas south of that city.

A year ago U.S. researchers began to collect samples of weathered oil and to study its toxic effects. A NOAA report estimated that the oil spill and early September storms last year killed as much as half the intertidal population along the Texas coast. Off the same coast, at least 37 tar mats measuring 60 by 6 meters and consisting of sand, shell, organic matter and weathered oil have formed. These will probably continue to be a source of pollution for the Texas coast where tar balls are expected to wash ashore throughout this summer.



Nigeria's oil blow-out showed flaws in contingency planning

ENUGU, Nigeria—For two weeks earlier this year oil blew from a rig in the Atlantic off Nigeria's Rivers State and worked its way through mangrove swamps upriver to several villages. Local officials say it seriously affected fish resources, drinking water and the mangroves.

Lack of communications, contingency plans and environmental regulations have led to a situation of conflicting claims; the need for better coordination has become apparent, and the extent of the damage is still to be determined.

Texaco's Funiwa 5 well in North Apoi field blew on January 17th. An environmental specialist for Texaco estimates that about 200,000 barrels of oil spread along a 15-kilometer area of the Atlantic shore and then up two rivers, the Sangana and Fishtown. At the end of January the blowout caught fire, and the well "bridged," probably because the undersea pocket collapsed as oil spewed out.

At the time, Reginald T. Furo, Special Adviser on Information and Public Relations to the state government, said, "The waters of the creeks and ponds, our natural habitat, are being soiled by thick layers of free-flowing oil and our basic way of life is dying in the hands of pollution."

Although Texaco says it immediately notified three federal government agencies of the blow-out, the Rivers State government in Port Harcourt apparently was not notified for 18 days. "By the time it came to the notice of the Rivers State government that a serious blow-out had occurred, much havoc had been done as the spill had spread beyond 35 kilometers," a government spokesman said.

Within a week of the blow-out a team from Texaco was at the scene (it included Dr. Jennifer Baker, a British marine biologist). Although there was oil on the beach, a Texaco spokesman said they found no evidence of hydrocarbons buried in the sand nor did they find dead fish or birds. They decided that "the natural activity of the surf and other elements was doing a clean-up job that would surpass anything we could do."

In the mangrove area, the oil company environmentalist said, "young mangrove shoots were covered with oil; they were not in good health." When the investigators dug into the swamp, they found some oil penetration and a few dead crabs and winkles.

However, an official Rivers State report said the oil had "completely destroyed the roots of the mangrove trees in most parts of the affected area" and that hundreds of trees had withered or collapsed.

Upriver, Sangano village was the most affected "although we saw no evidence of dead fish," the Texaco spokesman said. To ameliorate the situation, Texaco provided "work for 500 natives from five villages to do the clean-up around the shore near the villages and to clean their boats and to dig new wells." They were given shovels, rakes, dispersant, coveralls and gloves, he said.

But Dr. Iboniboye Ogbu, an American-trained mangrove ecologist, stated, "It will take not less than 10 years for the completion of a cleansing operation that will restore the ecology of the affected riverine areas."

Recently, the Rivers State government commissioned a study on the short- and long-term effects of oil on the riverine ecosystem. It will involve estimates of: the extent of destruction of marine life, the rate of regeneration of the marine environment, the effect of crude oil on the incidence of disease in the human population and on the health of livestock.

In February, Dr. Baker submitted a proposal to the federal authorities for a three-phase study of the shore and mangrove areas. Its implementation is still awaiting the formation of a group of Nigerian university specialists to be part of the team.

Meanwhile, the Rivers State government has finally begun drafting an anti-pollution law—Nigeria's first although it has been producing oil since 1956. Just last November, federal officials met with oil company representatives to develop contingency plans, for, as the Texaco spokesman said, the oil companies" original Emergency Mutual Assistance Plan "did not have enough meat to be of significant value."

JONATHAN N. OBINEGBO

Water quality...

THE WORST OIL SPILL in the history of the Panama Canal occurred June 8th, when the 52,000-ton tanker Texaco Connecticut struck the canal's east bank as it entered Gatun Lake. Up to 5,000 barrels of oil poured into the lake before the tanker entered a lock, where several thousand more barrels were spilled.

Much of the oil was blown into coves of Barra Colorado Island, in the center of the lake, where eight of the world's endangered animal species live.

Dr. Ira Rubinoff, director of the Smithsonian Tropical Research Institute, visited the site most recently on June 30th. He said turtles, iguanas and other amphibious animals have been badly affected, and that several new-born crocodiles were killed. He also saw oiled birds and fish.

At that time a clean-up effort coordinated by the Panamanian Joint Commission for Environmental Affairs had collected about one-quarter of the oil. Clean-up efforts continue.

A MAJOR TOXIC SUBSTANCE spill has gone unfound off the coast of Chile, with the government claiming it can do nothing about the problem and some officials claiming that there is no threat to life anyway.

In June, 78 drums containing the toxic "Chloropicrim Mixture" fell from the Liberian-registered ship "Villanger" as it made its way from Chile around the southern horn to Uruguay. None of the drums has been located.

Officials at first stated the toxic substance was safe and posed no threat to life or the environment. But a member of the faculty of the Southern University of Chile, Carlos Jara Senn, warned against the potential threat that the canisters pose as they go unfound. He said 8.8 liters of the chemical, an Aldrin-type soil fumigant, "could have long term effects," as well as mortal effects on local fish life.

The Chilean government has made no provisions in the past for taking care of toxic spills such as this, and apparently plans none.

EXCESSIVE WATER POLLUTION has forced Polish authorities to close most eastern Baltic Sea beaches, according to the daily newspaper "Zycie Warszawy."

The report quoted the director of the area epidemiological station, Marian Idzkowski, as blaming the lack of water purification plants along the coast. He said that to make a glass of Baltic Sea water pure enough for swimming it would have to be mixed with at least 100,000 glasses of clean water. He was quoted as saying that the contaminated water carried viruses and bacteria and that the sewage was not even chlorinated.

In Europe ...

BRITAIN'S WATER RESEARCH CENTER (WRC) and the World Health Organization (WHO) have signed an agreement to collaborate on a

European-wide water survey.

WRC will report on drinking water quality, water treatment, ground water pollution, tidal water quality, and sampling and analysis, with special priority given to the health aspects of drinking water. WRC will also prepare a survey of the administrative structure of European water services and provide the access to various information systems.

WHO's Regional Director Dr. Leo A. Kaprio said this represented a major step forward in the development of its European environmental

health program.

PORTUGAL AND SPAIN have signed a nuclear safety agreement. Portuguese authorities have been worried for some time about Spain's existing and future nuclear plants on common rivers near the border.

According to the agreement, each country must be notified about the construction of any plant within 30 kilometers of the border, supplying information about construction, nuclear safety and radioactivity protection. Sufficient time must be given for the neighboring country's opinions and suggestions before building

Both Spain and Portugal have promised to install systems for radioactivity detection and to adopt emergency formulas, although Portugal has no nuclear power stations.

ENI. THE ITALIAN state-controlled hydrocarbon group, and ENEL, the electric power company, will jointly exploit Europe's largest geothermic plant at Pian Castagnaio, near Mount Amiata in central Italy, on the basis of a recently signed agreement.

Through a four-kilometer-long pipeline, ENI will supply heat to a 400,000-square-meter agricultural area for the production of flowers and

early fruits and vegetables.

Geothermal energy will also be used, out of the same plant, by a consortium of Tuscan municipalities for industrialization and heating in the Paglia Valley.

THE NORWEGIAN POLAR RESEARCH Institute will this summer study polar bears on the drift ice east and north of Svalbard (Spitzbergen) in the Arctic.

The research will lead to the preparation of a report which is to be submitted to the Norwegian Ministry of Environment before an international conference to be held this fall on the entire polar bear situation in the Arctic.

Man-made eco-changes could control bilharzia

GENEVA-Man-made changes in the environment could and should play a key role in controlling schistosomiasis (or bilharzia) the parasitic disease that infects over 200 million people in the

A World Health Organization (WHO) committee found, "The advantage of control by environmental modification is that permanent changes can be made that have a lower maintenance cost than other methods of control.'

They believe that the population at risk is increasing due to expanded water impoundment areas and irrigation canal systems, which provide a habitat for the host snail that transmits the disease.

The WHO report states that success can be expected from longterm control programs involving a combination of chemotherapy, molluskiciding, basic sanitation, and improving the supply of potable water at the village level.

Other environmental modifications have also been effective: weed control in Lake Volta; filling and draining snail habitats in Iran; faster water flow and lining canals with cement in Puerto Rico along with the elimination of night storage ponds and improved drainage.

One major problem to be faced, the report said, is the lack of cooperation between health administrations and other authorities when man-made water resources are planned and built in areas where bilharzia could follow. WILLIAM G. MAHONEY

Norway saves its biggest lake from a near-certain death

OSLO-Norway's biggest lake has been saved-because the people and their government, both local and national, made financial sacrifices to bring it back from an almost certain death.

Just a few years ago, a blue-green alga, Oscillatoria, was slowly strangling all life in Lake Mjoesa, which covers an area of 365 square kilometers in southeastern Norway. Phosphates from a variety of sources-farms, homes and industry-led to its proliferation.

When the save-the-lake campaign ends later this year, about 1.2 billion kroner (\$247 million) will have been spent on the project, which was spearheaded by the Norwegian Ministry of Environmental Affairs.

A total of 40 new purifying plants have been built, and 11,000 private homes outside the town have been directed to improve their sewage arrangements at an average cost of \$3,000 per family. Some 560 kilometers of roads, streets and cultivated land have been dug up for new or improved sewage systems. Out of a total 6,000 farmers, 2,700 have invested about \$37 million in antipollution measures. Industrial concerns around the lake have spent almost \$20 million on pollution control.

And the results of all this effort? Fish are found again in the lake and its tributaries because the plankton have returned. People are allowed to swim there again. And most important of all, the drinking water for 250,000 people is now safe, the Ministry said.

West Germany has figured out | Air Quality... the costs of air pollution



BONN—Data on the cost of treating stack gases to comply with West German air pollution standards have been compiled with a high degree of accuracy. During 1978-80, air protection measures cost about \$3.27 billion, according to Ministry of the Interior

Heretofore, little has been known about the cost of damage caused to buildings, materials and art objects by polluted air. Now, for the first time, a study prepared by the Institute for Environment Protection of the University of Dortmund has put a price tag on damage caused rather than on measures to restrict damage: \$2.4 billion per year for material damage alone.

This breaks down into \$830 million in damage to buildings; corrosion of various materials cost between \$550 million and \$1.1 billion; \$420 million was spent by individuals for washing and materials over and above normal needs; and \$70 million was for damage to or retarded growth of agricultural products.

All of these elements can be identified with reasonable accuracy. It is much harder to evaluate damage to the health of the citizenry. A recent OECD study put that damage at between 3 and 5 percent of an industrialized country's gross national product. In Germany's case that would translate into a cost of between \$22 and \$39 billion a year.

Likewise difficult to evaluate is damage to works of art and monuments. Few of either have a fixed market price, and the damage they suffer, at least from year to year, is hard to perceive. The most reliable method of studying the damage to monuments is by comparing old photographs with their current condition. Invariably this shows extensive corrosion and deterioration of stone and ironwork, and the yearly rate of damage appears to be accelerating.

Accurate cost records for the repair of corrosion damage to at least one of Germany's more notable monuments—the Cologne Cathedral-have been maintained for the past 30 years. In addition to the cost of repair to World War II bomb damage, cathedral authorities have been spending an average of \$1.7 million a year replacing corroded stone work in both structural and ornamental elements. As far as can be seen now, work at that rate will have to be carried on indefinitely as routine maintenance. In addition, the entire facade of the south transept is scheduled to be replaced over the next 20 years at a cost of between \$33 and \$44 million.

A third cost, not normally associated with air pollution, is the cost of escaping from it. The Dortmund University study estimates that the inhabitants of such a city as Munich (population 1.3) million) spend around \$37 million a year just to get out of the city and into wholesome recreational areas. J.M. BRADLEY

BRITAIN'S LARGEST BRICK PRODUCER, the London Brick Company, says that if the Bedfordshire County Council insists on stringent pollution controls for its replacement brickworks, it will not be able to compete with other manufacturers.

The company says it plans four new superkilns, each with a 122-meter-tall stack, to dilute and spread the emissions so as not to harm local residents and farmers, who claim that sulphur dioxide and fluoride emissions are polluting land and killing livestock. However, the idea of tall stacks has not reassured Scandinavian governments who consider Britain a major contributor to their acid rain problem.

The county's environmental services committee recommended work go ahead, with clean-up methods introduced at a later stage. But the Council has united in saying that the kilns should be designed to remove all pollutants and odors.

THE HONG KONG Secretary for Environment, Derek Jones, has said a new Air Pollution Control Bill will be presented soon. According to Jones, pollution by sulphate compounds in Hong Kong industrial areas is not high, but he admitted that present limited monitoring is insufficient for a true assessment of air pollution in these areas. The government is recruiting more staff and ordering new gauging equipment for a more comprehensive appraisal.

THE "TATAMI" -or Japanese straw mat-may help remove nitrogen dioxide from the air, according to experiments done by students of the University of Tokyo. It was found that each square meter of tatami can purify every hour a cubic meter of air contaminated with 100 parts per million (ppm) of NOx. However, the mechanism of the purification process is still unknown.

SAUDI ARABIA HAS LIFTED A BAN on the use of diesel vehicles. The use of economical antipollution devices, however, will be compulsory for all vehicles. A committee consisting of Interior Minister Prince Naif ibn Abdul Aziz, Commerce Minister Dr. Soliman A. Solaim, and Health Minister Dr. Hussain Al-Gazairi, has been set up to supervise compliance with this

Wildlife...

773 ANIMAL AND PLANT SPECIES RISK EXTINCTION, according to the updated worldwide list of endangered and threatened species recently released by the U.S. Fish and Wildlife Service.

The new total is up 77 species from the last list, published in January, 1979. The increase "has more to do with improved research than the continuing, general deterioration of the world's wildlife environment," said Paul Opler of the Service's endangered species office. The new roster includes the first foreign plants ever listed—the Guatemalan fir and Chilean false larch. The Caribbean monk seal, West African manatee and the North China Sika deer were also added.

Some 276 species are native to the United States, nearly triple the number of U.S. entries on the first (1973) list.

MORE THAN A THOUSAND SPECIES of plants are facing extinction in India, Dr. S. K. Jain, Director of the Botanical Survey of India, told WER. He is principal investigator in a \$38,500 five-year project on threatened plants in India, being carried out jointly by India and the U.S.

"We are losing species of flora due to natural and man-made causes. We have no precise data as to how many are already lost and how many are under threat," he said.

According to the threatened plants committee of the International Union for the Conservation of Nature and Natural Resources (IUCN), it is estimated that about 20,000 to 30,000 of 300,000 species of plants worldwide are reportedly "dangerously rare or under threat."

THE INCREDIBLE VARIETY of plantlife unique to Western Australia—where as many as 3,000 species have yet to be described—is being protected under stringent state law which took force in mid-April. Under the law, it will be illegal to remove protected flora from state or private land without permission of the owner.

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What's gnu?

Giraffe steak or gnu-tail soup in Zimbabwe

SALISBURY—Fancy a giraffe steak, a shoulder of rhino, a hyena leg roast or a gnu-tail soup?

Zimbabwe farmers are discovering that wild bush areas of their farms can be utilized for rearing browsing wild animals.

The Department of National Parks and Wildlife Management is encouraging meat production of animals such as elephants, sable, zebra, eland, bush pigs and even the big cats. Said a senior ranger, "Some of these animals might prove difficult but others such as giraffe are easy. There's no need to be squeamish about it. It's all meat, isn't it?"

Wild animal farming often includes shooting safaris. The farmer gets a profit from hunting fees, accommodations, the trophy—and the meat.

Ecologist John Lightfoot told a meeting in Bulawayo: "There are seven million hectares in Zimbabwe suitable for ranching these animals. And the prospects are good for marketing the venison worldwide."

JOHN KELLEY

South African officials are accused of illegal hunting

JOHANNESBURG—Serious accusations concerning illegal hunting have been made against high-ranking South African state officials and army officers by both pro- and anti-government newspapers in South Africa. The publicity has triggered an official inquiry into the use of Army weapons and vehicles, including helicopters, for hunting in game-rich Namibia.

In the middle of the inquiry a cargo of 31 tusks was seized from a military plane in Namibia and a Security Branch policeman arrested. The consignment was addressed to the Chief of Security Police in the Transvaal, but the head of security said he is mystified by it. It bore the name "Mr. Brink" (the head of security is Muller).

A former Minister of Economic Affairs in South Africa became embroiled in the controversy after twice denying to "The Star" that he had asked legal ivory dealers to help him dispose of 40 tons of ivory (worth \$1.8 million and the product of an estimated 4,000 elephants). Later he said he did remember making the inquiry in 1978 but claimed the reporter had deliberately confused him. The deal fell through and he never saw the ivory.

South Africa has only 8,000 elephants, which are scientifically managed. Tusks exported via South Africa come from Central Africa.

JAMES CLARKE



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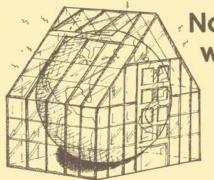
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No country
will be
immune
from CO₂
climate
changes

WASHINGTON—The problem of increasing amounts of carbon dioxide warming our atmosphere "will pose exceedingly difficult and divisive policy questions for all the world's nations," a U.S. National Research Council panel reported recently.

"We do not know enough to address most of these questions right now," they continued; however, "we believe we can learn faster than the problem can develop."

The study group was asked to assess the likely social and economic consequences of a build-up of atmospheric carbon dioxide. It was understood that they would have to base their conclusions on current information.

They were told to try and look into possible climate changes over the next half century or more. They concluded: "We face the possibility of a markedly different climate in 50 years."

"Different countries will be affected differently," they found, "but none will be immune. No country can forestall undesirable consequences by its own actions alone."

The carbon dioxide problem "is linked to other intensely controversial problems: energy, environment, population, economic growth, north-south conflict, unequal distribution of resources and wealth, pollution across boundaries, migration."

The report continually stressed the uncertainties that are faced. By the middle of the next century, it said, "we may have a climate almost as different from today's as today's is from the peak of the last major glaciation. At the other extreme, we may only experience noticeable but not unfavorable effects."

The uncertainties lie in the rate of development of new energy sources to compete successfully against coal. They depend also on how much atmospheric CO₂ our forests and waters can absorb.

Possible climate changes must be estimated from models of the entire system—the atmosphere, oceans, ice and snow—and the report suggested much more research had to be done. The panel said that even in agriculture, expected to be one of the most affected activities, it is possible that enhanced carbon dioxide might increase photosynthesis (a plus) or it could reduce rainfall, affect genetic adaptation of crops and irrigation (minuses).

International cooperation...

ENVIRONMENT EXPERTS from the five member countries of ASEAN (Association of Southeast Asian Nations) have called for a convention on endangered species to set up a framework for regional wildlife protection. A majority of the endangered species listed by the International Union for the Conservation of Nature comes from this area.

CHINA and the World Wildlife Fund are cooperating on the first-ever international research project to save the giant pandas.

The panda—used as the WWF sýmbol—is threatened with starvation because the bamboo on which it feeds is going through its 100-year dieback cycle. It takes about three years before bamboo seeds grow into edible plants and, therefore, a program to feed the pandas for three years will be part of the research work.

Research will also involve studies of the captive breeding of pandas and their habits and behavior in the forests. There are now less than 1,000 pandas in the highlands of Sichuan province.

IUCN, The International Union for Conservation of Nature and Natural Resources, is beginning an "Asian Elephant Project" to save elephants in Thailand from extinction, the Thai National Environment Board announced.

The project will involve conducting a census of Asian elephants in sample areas, studying the ecology of these areas, gathering information on elephant migration, and defining the density of elephant population in each area. Finally, IUCN will provide Thailand with personnel to establish and manage elephant ranges in suitable areas around the country. The project, funded by IUCN, is expected to be completed in three to four years.

JAPAN MAY FINALLY RATIFY an international convention controlling the trade in endangered animal and plant species. Japan's ratification of the Washington Convention-if approvedwould come into effect seven years after Japan agreed in March 1973, with 69 other countries to participate in the treaty. The postponement was due to strong domestic opposition from manufacturers and processing firms of animal skin products. The Diet (Parliament) will approve participation on condition that Japan be allowed to import nine species of fauna whose trade is regulated by the convention. The nine species, including fin whale, Indian lizard, green turtle and musk deer, may be imported if the exporting countries issue the necessary certificates.

In a worst-case scenario, they speculated that Arctic and Antarctic floating ice and ice sheets could disappear, raising sea levels by about 15 to 20 feet. Marine resources, sensitive to changes, would also be affected.

Because there could be a different distribution of climate, it is possible that large numbers of people would have to migrate, leading to great political as well as human problems. The major cause of this would be changes in the availability of water; semi-arid regions would be increasingly affected by drought.

Preventing or delaying the increase of carbon dioxide would come "mainly by restricting the use of fossil fuels, although management of land and forests could also contribute." The problem here is that the major coal reserves are concentrated primarily in the U.S., the Soviet Union and China. "Emissions can therefore be controlled only if these countries, which agree on little at present, can agree on future restrictions"—which may be difficult since they would benefit most from a warmer climate.

Implications for policy makers are clear—even though the uncertainties of CO₂ effects are apparent. The National Science Foundation panel suggested that the main energy-consuming countries "keep open a number of options for energy and not become committed to an extended period of unrestricted fossil-fuel use."

The near-term emphasis in the U.S., they said, should be on research "with as low a political profile as possible." But, they reported, some on the panel believe "the need for preventive measures is already apparent and urgent."

Knowledge can probably grow faster than the problem, they concluded. At the same time, they urged that the CO₂ issue "should appear on the international agenda in a context that will maximize cooperation and consensus-building and minimize political manipulation, controversy and division." LIBBY BASSETT

Millions of children will die this year from unclean water

GENEVA—At least 13 million children will die in developing countries during 1980 because of contaminated water.

Dr. Halfdan Mahler, Director of the World Health Organization, made this prediction and placed the blame directly upon Third World governments which, he charged, had done too little to provide their citizens with clean drinking water and adequate sanitation.

After reviewing the problem, Dr. Mahler announced that the UN General Assembly would launch a campaign this November aimed at promoting clean water supplies.

In a statement to a WHO committee, Dr. Mahler stated that national health authorities have too often "failed to recognize the importance of clean water to health." He noted that "while many countries have set up national action committees, country plans at this point are mainly statements of intentions rather than definite commitments backed by resources." WILLIAM G. MAHONEY

Czech coal-area kids get free holidays away from pollution

PRAGUE—Children living in Czechoslovakia's heavily polluted coal basin get government-sponsored holidays in the mountains to "counteract" the environmental damage they suffer the rest of the year.

Some 103,510 children live in the five north Bohemian coal mining districts. To offset the negative impact of air pollution on their health, all children receive free milk and fruit snacks during the school year. And many spend at least three weeks in the mountains; children from the worst areas are sent out twice a year.

School inspector Anna Bradkova said that during the three weeks a child's body builds up enough reserves to counteract environmental damage for about 100 days. However, an international environmental health expert said there would be no appreciable benefit to the child's health, except perhaps his mental health.

Last year the great majority of children were sent to special schools in the countryside, a few thousand others went to sanitoria or to Yugoslavia and the Soviet Union. Local authorities also subsidize summer camps and winter skiing trips for about 40,000 children annually and, for minimum sums, organize family weekend trips to recreational centers.

North Bohemian government authorities insist on what they call "technological discipline" from the coal mining industry and collect fines for any breach of air pollution regulations. These fines are then used to expand parks and gardens, build swimming pools, and to pay for the free snacks and children's recreation.

IVA DRAPALOVA

Ireland mounts an all-out energy conservation campaign

DUBLIN—The Irish government isn't romantic when it suggests people eat by candlelight in hotels, it's being practical, trying to bring home to the nation the need for energy-saving.

It is embarking on an all-out conservation campaign: an "energy hotline" which people can ring for advice on energy-saving, a National Energy Week in October, and a nationwide speaking tour by the Minister for Energy.

The new national campaign was announced by Energy Minister Michael Colley when he said Ireland's oil bill was topping £700 million (\$1.5 billion) and affecting the quality of life nationally. His campaign was announced amid a gloomy economic prediction from the Central Bank of Ireland which warned that continuous oil price increases would mean a sharp drop in Irish living standards and severe problems for the economy.

Energy wastage in the home, factory and on the roads is the target of the campaign which will include cash grants to improve thermal insulation. First priority is to be motorists in a nation where the cost of a gallon of gasoline is now £1.60 (\$3.40).

TOM MacSWEENEY

In Europe...

LEONARDO DA VINCI'S FRESCO "The Last Supper" is cracking, and art authorities blame traffic vibrations, sinking ground and the delayed effects of a 1943 bombing.

The Italian government called an urgent meeting of experts to save the fresco, one of the world's most renowned art treasures. It has a fissure two meters long and one centimeter wide and is also crossed by a number of minor and hardly noticeable cracks.

Restoration of the paintings' colors, begun in 1978, is being threatened by mold, smog and dust

Milan's subsidence, due to massive pumping of water for industrial use and for the city aqueduct, is causing stability problems for several monuments, including the Gothic cathedral.

BRITAIN'S RESERVES OF GOOD FARM LAND will be swallowed up in 200 years' time, and its best land in 50 years, if present policies and attitudes to land use continue, says the first report of a private body, the Land Decade Educational Council.

The Council, formed last October, has architects, planners, geographers and politicians among its members. The report's main article is by Dr. Alice Coleman, director of the 1963 Government Land Utilization Survey. She describes the loss of farm land since that date as "appalling evidence of planning failure" and criticizes the complacent attitude of government officials who assumed that Britain could indefinitely continue to maintain food production by more intensive cultivation.

"Carried to its logical conclusion," says Dr. Coleman of this policy, "in 200 years' time we shall be producing an infinite amount of food from a zero amount of land."

THE FIRST-EVER CONFERENCE on cleaning up Europe's cities was held in Madrid this June. For three days, some 350 delegates from 15 nations met to exchange views and technical knowhow.

Madrid Mayor Enrique Tierno Galvan announced at the conference that a \$100 million credit had been approved for a four-year, \$464 million clean-up of Madrid's water system—the most ambitious plan ever drafted in Spain.

The plan drew criticism from one Spanish expert, Prof. Llamas Madurga, because it ignores underground water. He said Spain could suffer an ecological disaster similar to that of Love Canal in the U.S. from neglecting contaminants in underground waters.

Recycling ...

THE JAPANESE GOVERNMENT has recently completed a \$41 million experiment to show that waste materials can be converted into useful commodities.

The experimental plant, organized by the Science and Technology Agency, can process a maximum of 100 tons of waste, equivalent to the amount of trash produced daily by a city of 100,000 people. The end result is 28 tons of compost, 7,400 cubic meters of fuel gas, 25 tons of refined pulp and three tons of ferrous metal. According to the agency, this is enough to enrich 1.4 hectares of farmland, supply fuel to 2,000 homes, make paper for 55,000 newspapers and help to produce 50,000 soft drink cans.

The Japanese government has now decided to study the possibility of building chains of recycling plants for the 36 million tons of trash emptied from bins throughout the country

every year.

RETURNING DISCARDED SOFT DRINK CAN'S has become a half-million dollar business for thousands of Australian children who collect the throwaway "tinnies", as they are called.

The children are at football games, rallies, fairgrounds, any place where there's a crowd, with big plastic garbage bags in hand, scooping the cans off the ground and out of litter containers. Small fortunes have been made by those astute enough to scoop empty beer bottles off the desert roadways for cash and recycling.

Alcoa of Australia paid out a record \$550,000 for the used aluminum cans in the first quarter of 1980, paying about a cent a can. A total of 57.4 million cans—more than double the figure for the whole of 1979—were returned in the cashacan program, to 165 collection centers throughout the country. This represents a 38 percent return, the highest of any country in the world.

A MAJOR OIL COMPANY has sponsored a horse race in Zimbabwe to promote fuel conservation and recycling.

The Shell Company spent \$40,000 on prizes in the "Conservation Guineas" race at Borrowdale Park in Salisbury.

"We wanted to promote our system of collecting old oil drums and used oil for recycling," said Shell manager John Portlock. "Our reclamation plant processes about 300 tons of oil every month and we wanted more awareness among industrialists, farmers and motorists about the values of the scheme."



The EC finds recycling could save \$15 billion a year

LONDON—The European Community throws away over \$15 billion every year. This, according to EC figures, is the estimated value of the 1.8 billion tons of waste produced each year by the nine Common Market nations. It works out to 5 million tons a day, and the total is growing by nearly 3 percent a year.

This is why, when government representatives met with leaders from industry and environmental and conservation pressure groups this June, all stressed the need for concerted action on waste disposal and recycling.

The occasion was the first European Conference on Waste Management, held here June 17-19.

Waste management was viewed against the background of oil price increases, the dwindling of natural resources such as tin, zinc and wood—and the increasing amount of hazardous wastes from nuclear and other industries which could affect generations to come.

More research and education were called for in packaging, recycling and obtaining energy from waste materials. Waste management strategies were seen as an essential part of overall economic planning for the Community.

Draft directives on recycling paper, wood and beverage containers were put forward. It was suggested that governments pressure public agencies to increase their use of recycled paper—about one-third of the paper now in use is recycled. The Community currently imports 50 percent of the 30 million tons of paper and board consumed annually. This cost the nine member states more than \$11.65 billion last year, and was second only to oil imports in value.

Recycling beverage containers—cans and bottles—was the most contentious subject at the conference. Industrial representatives said that the suggested distribution system for returnable bottles and cans was an unrealistic aim.

Britain's Friends of the Earth defended the proposed system, contending that \$211 million and up to 60 percent of the raw materials involved could be saved in Britain alone. The energy saved, they maintained, would be equivalent to a third of the output of a new nuclear power station.

The conference closed with a further call for coordination and more governmental action, and the suggestion of a further conference in two or three years to review progress.

BARBARA MASSAM

Poland invests heavily in pollution prevention

WARSAW—Poland plans to spend 1.5 percent of all investment funds for environmental protection in newly constructed plants, factories and works, said Dr. Ludwik Ochocki, the recently appointed Vice Minister for Administration, Local Economy and Environment Protection.

"The total will reach some nine billion zlotys a year (\$300 million at the official rate), and," he noted, "this doesn't include local costs or any international programs."

Air and water pollution are Poland's two most important problems, Ochocki said, because of the speedy industrialization and urbanization of the country.

"We are doing our best, but really industrialization in recent years was so fast we were not able to keep fully abreast of the situation. Nevertheless we managed, for instance, to tighten our emission control. Ten years ago we could catch only 80 percent of our air pollutants; now we take 93 percent out of the environment."

Even the nine billion zlotys is not enough for a complete cleanup although, Ochocki said, it is an "amount sufficient to halt any worsening of the situation."

Another trouble, he stated, is that because of incompetence and lack of materials in the construction firms, "we are able at most to use up only between 70 to 80 percent of the money we have at our disposal."

Ochocki's department was instrumental in drafting the environmental protection code recently enacted by the Polish Sejm (parliament). It outlines general environmental protection policy, determines responsibilities, arranges for control and for punishment. Penalties may be quite heavy. They are subtracted from a factory's profits and affect all workers by decreasing their bonuses.

Recently a small factory in the tiny town of Wielun in central Poland was fined two million zlotys for polluting a nearby creek. This sum was equivalent to two months' wages for the workers, or a halving of their yearly bonus.

The ministry currently is organizing the State Environment Protection Inspectorate, the principal organ controlling implementation of the laws.

Poland cooperates with other nations and international organizations on environmental protection as well. "It may sound ridiculous sometimes to some people, but we are signatories of even such protocols as on protection of whales or tropical forests. Why leave whales to two nations only when they are the property of all mankind?" Ochocki asked.

In the near future, the vice minister said, Poland's problems of waste and sulphur dioxide will continue to grow. "Because of energy problems we must use low-grade coal in our power plants, hence SO₂." But generally there will be a marked improvement within five or 10 years, he promised.

JERZY BRODSKI

In Eastern Europe ...

A MAJOR CONTROVERSY broke out in Poland recently about plans for a new coal basin in western Poland. Opponents believe it would have a fatal impact on the life of Poznan province.

Mining specialists said that to excavate the coal, a ditch 60 kilometers long and 5 kilometers wide would have to be dug across the region.

Said the liberal Communist weekly Polityka: "Such an investment would produce 9,000 megawatts a year during the next 20 years...But for nature to recover from so massive an enterprise would take at least a generation, if ever. Underground water would be lowered. They would pump into the Warta River, killing all the biological life in it with major consequences for the region that river flows through."

The weekly added: "Profits from brown coal would last for 20 years. It's a lot. But losses in agriculture and animal breeding would be practically irretrievable."

In a country where all articles are subject to censorship, this means that opposition to the project runs strongly within the party leadership as well.

LEADERS FROM THE 10 SOVIET bloc states said in Prague that the expansion of fuel, energy and raw material sources was of "key importance" for all their countries. Within this framework, construction of nuclear power plants would play "an increasingly important role."

Radio Prague quoted the participants of the annual Comecon session (Eastern Europe's Common Market) as saying that changes in the world economy and trade made it more difficult to obtain raw materials, fuel and energy.

At the meeting Czechoslovak and Soviet Premiers Lubomir Strougal and Alexei Kosygin signed a program covering their nations' cooperation for development of nuclear power in Czechoslovakia until 1990.

Under the terms, the Soviet Union will assist Czechoslovakia—in addition to supplying equipment—in project design and construction of more nuclear power stations.

ROMANIAN RESEARCHERS claim to have completed the first solar plant in the world to be used for the preparation of road building materials. The achievement was reported in the Bucharest weekly, Romanian News.

To prepare the asphalt, tanks of thousands of tons of bitumen are used, which must be heated to prevent the mixture from solidifying. A team of specialists, led by Coleta de Sabata, developed a 600-ton tank using solar energy for heating. Some 30 tons of traditional fuel can be saved annually, specialists said.

Environmental management . . .

THE SULTAN OF OMAN has established a Council for Conservation of the Environment and Prevention of Pollution.

In a recent speech, Sultan Qaboos Bin Said outlined council objectives: to prepare a national conservation strategy, to draw up policies and lay down guidelines for the ministries of this Arabian Sea country.

He said the council will study proposals for land development, resource exploitation, industrial and commercial projects and any other activities that may affect the environment—to make sure they conform to environmental criteria outlined in the national conservation strategy.

NIGERIA'S Federal Minister for Housing and Environment, Dr. Wahab Dosumu, recently announced that a massive education and public awareness campaign was being planned.

He also said that an Environmental Protection Agency bill would soon be placed before Nigerian legislators, outlining the obligations of the Federal and State governments—and industry as well—as to the need for maintaining a pollution-free environment.

THE PHILIPPINE National Pollution Control Commission has completed its 1979 environmental report. It highlights the completion of environmental impact studies on the proposed nuclear power plant in Bataan and the protection of 70,000 hectares of mangrove swamps. In addition, a five-year public health program is underway. Under the program, 200,000 drinking water sources will be disinfected, 1,500 toilets will be built and 1.4 million human waste disposal facilities will be installed.

A JAPANESE GOVERNMENT WHITE PAPER on environment has claimed that pollution is on the decrease in the country as a result of the implementation of anti-pollution measures in the '70s. The paper, presented by Environment Agency Director General Yoshihiko Tsuchiya, used as reference a recent survey conducted by the Organization of Economic Cooperation and Development (OECD). According to OECD data, sulphur dioxide has been reduced by more than 50 percent from the 1970 level in Tokyo, Osaka and Nagoya.

The paper, however, admitted that some types of urban pollution such as air and traffic pollution caused by motorcars, contamination of drinking water sources, and domestic wastes have been worsening. The paper also suggested the prevention of pollution by improving traffic and distribution systems and the cleaning up of household wastes.

The Saudis have no eco-policy so industry polices itself

JEDDAH—Although the Saudi royal family is becoming increasingly aware of the need to protect the environment of the kingdom, the fact remains that there are no environmental standards for industry to follow. There has been some progress towards developing a comprehensive set of guidelines, but it has been slow. As long ago as 1977, Crown Prince Fahd (No. 2 in the Saudi hierarchy) asked the Meteorology Directorate to begin setting environmental standards, but Fahd has yet to sign the decree that will give muscle to their guidelines.

According to Abdulbar Al-Gain, deputy director general of the Meteorology Directorate, "the philosophical framework" for the standards is in place. What needs to be established are the permissible levels for various pollutants. A working paper of standards has been drafted and will be discussed shortly by various ministry officials. It is not known when a final vote will be taken to make the draft law.

Until now industry in Saudi Arabia has been allowed to police itself. In fact, it was Aramco (the Arab-American Oil Company) which performed some of the first research into the ecology of the Arabian Gulf waters in 1970 and 1971 after the sinking of an oil tanker and several oil spills made headlines. However, there is still little data on how much stress the environment can take.



Environmental scientists insist that the situation in the Gulf is precarious. The Gulf, they say, could become severely polluted by desalination plant brine discharges, land fill operations, other industrial wastes, dredging and oil spills from heavy tanker traffic. The 17 major oil companies operating on the Arabian side of the Gulf have pooled their resources for cleaning up spills by forming the Gulf Area Oil Companies Mutual Aid Organization (GAOCMAO).

The size and structure of the Gulf make it very susceptible to the erosive and toxic effects of pollution: 500 miles long by 180 miles wide, the Gulf is only 50 fathoms at its deepest point. Some scientists claim that pollutants entering the Gulf are not being flushed out to sea. The high degree of evaporation in the Gulf is not matched by an equal amount of precipitation and run-off creating a steady inflow from the Gulf of Oman with no equivalent outflow. Other ecologists disagree: They counter that there is some circulation and that Gulf organisms can absorb a certain amount of pollution without harm.



But, in fact, shrimp life has been suffering. Shrimp catches have declined alarmingly. It is unclear, however, whether the decline is due to pollution or overfishing or both. It is known that landfill

activities destroy the shallow breeding grounds of shrimp. Aramco claims its studies show that its operations have not hurt marine life. They say that in Tarut Bay, a major shrimp-spawning area next to their Ras Tamura refinery, "the shrimp seem to be thriving."

To halt the dramatic decline of shrimp, countries surrounding the Gulf recently imposed a moratorium on shrimp fishing. In Bahrain, once the delight of shrimp fanciers, diners now have to settle for frozen shrimp imported from abroad.



Saudi correspondent Robert Fraga adds: Although a survey of oil spills reveals relatively few major catastrophies of the Torrey Canyon or Amoco Cadiz sort in tropical waters, this may reflect statistical and organizational deficiencies in many countries. Illegal bilge pumping from tankers and natural seepage have contributed to Arabian Gulf pollution. In 1970 one notable spill from a pipeline break at Tarut Bay, 20 miles north of Dhahran, released about 100,000 barrels of light crude into the water. Residual traces of pollution were discovered five years later but no great damage appears to have been done to local fauna.

Arabia's Red Sea reefs, among the world's most spectacular, fall prey to other, apparently more damaging, forms of pollution. One barren stretch of reef has been noted by diver Hagen Schmid in the vicinity of the Jeddah desalination plant. Its discharge of brine and sulphuric acid, he contends, has poisoned about two kilometers of coral.

Until recently the Red Sea has not received the sort of multinational concern given the Arabian Gulf. Nonetheless, a Saudi-Sudanese Commission for the Development of Red Sea Resources has spent about \$9.5 million in studying how to dispose of mine tailings without ecological ill effect, and countries surrounding the Red Sea met in Tunisia four months ago to discuss the establishment of an organization along the lines of GAOCMAO.

MILAGROS ARDIN

Zimbabwe plans to protect the Victoria Falls rain forest

SALISBURY—The thin line of rain forest that runs alongside Zimbabwe's magnificent Victoria Falls could be inundated by tourists now that the war is over and the country has gained independence. But the government is planning to control the potential damage.

Not more than 1,000 people a day will be allowed into the rain forest.

The Tourist Board will organize walking tours along the river, create a wildlife park, a bird sanctuary and aquarium and an outdoor museum. Eventually, it is hoped that the road and rail bridge to Zambia, which is just below the Falls, will be removed out of sight some three or four miles downstream.

IOHN KELLEY

In Africa...

GROWING PUBLIC CONCERN (by Members of Parliament, letters in the press, etc.), has forced Kenya to take action to reduce soil erosion and the destruction of its natural forests.

In a nation-wide speech, President Daniel Arap Moi announced the appointment of a Presidential Commission to coordinate national policies for soil conservation and afforestation. He said the members, still to be named, would be prominent Kenyans with specialized knowledge and background.

President Moi said: "We cannot afford to go on losing topsoil and forest cover. We have tended to approach all natural assets with the idea of exploitation without thought of the environmental cost. Now we must move into an era of planned restoration and scientific conservation to sustain yields."

ELEPHANT POACHING IN UGANDA continues unabated, a team of experts found during an on-the-spot survey this March and April. There are fears that ivory poachers may eventually kill all the elephants in that strife-torn country.

Team leader Dr. Iain Douglas-Hamilton said that since 1972 the population in Rwenzori National Park has fallen from 3000 to 150. In southern Kabalega Falls National Park only 160 elephants remain of the 9000 that were there seven years ago. In northern Kabalega, where anti-poaching measures are still in force, 1200 remain of a 1973 population of 5000.

The team, sponsored by several wildlife organizations, estimated that many of the elephants had been killed within the past year—after Idi Amin fled to Libya.

LOANS OF MORE THAN \$170 MILLION have been negotiated through French and German banks and companies for construction of the first stage of a thermal power station near the banks of the Zambezi River at Wankie, a major wildlife area in Zimbabwe. Another \$145 million is being sought by the new government of Robert Mugabe to complete the project.

The power station will take some pressure off plans to straddle the river with four new hydroelectric plants designed to meet the power requirements of Zimbabwe and Zambia over the next 40 years.

Conservationists have been concerned about turning the Zambezi River into a 1,000-milelong string of lakes, saying it would affect wildlife, river life, tribes living nearby, the ecology generally and weather patterns in the

Land Use ...

ENTERPRISE ZONES are the flatest British remedy to combat inner-city decay. Local authorities will be invited to select suitable zones. To attract private business they will be able to offer tax reductions or exemptions and other incentives for which they will be compensated by the central government.

 The attraction for local authorities is that compensation will increase as development proceeds, up to 100 percent for all rate income lost.

Legislative provisions for the creation of the Enterprise Zones have been approved, and certain local authorities have been asked by the government to submit proposals. Minister for Local Government Services Tom King hopes to announce the choice of sites in July.

ITALY'S ENVIRONMENT FUND, FAI, a non-profit, government-recognized institution for safeguarding the country's environment, has been granted a 57-hectare area near the mouth of Po River, which the fund plans to turn into a "protected oasis" for lagoon fauna.

The municipality of Ferrara also allotted \$84,000 to improve the area, and it banned hunting around the oasis.

FAI, the Italian version of England's National Trust, recently purchased areas of archaeological interest near Naples and Milan as well as woodland near Portofino, along the Italian riviera, and on Capraia Island to save them from building speculators.

THE SOUTH KOREAN CONSTRUCTION Ministry and Home Ministry will launch a crackdown on illegal construction activity in the greenbelt zones of the country, according to Construction Minister Choi Jong-wan.

Choi's remarks followed a recent recommendation from the Korea Research Institute for Human Settlements that the government should soften its control of greenbelt zones as a way of expanding the acreage for housing construction. At present, the greenbelt areas account for 5.5 percent of the nation's total land area.

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The emphasis is on environment in Tanzania's new capital

DAR ES SALAAM—Using guidelines laid down by President Julius Nyerere, a unique plan has been developed for Tanzania's new capital. It emphasizes both economy and environmental protection.

The new capital, Dodoma, will blend in with the surrounding countryside and capture the atmosphere of village life in the country's open spaces. Located on the arid and under-developed central plateau, Dodoma "is not a copy of other capitals or other famous cities," explained the Director-General of the Capital Development Authority, George Kahama. Instead, he said, it is "truly Tanzanian in design."

Tanzanian and expatriate town planners worked together, with UN assistance, to develop the design which was outlined in the recently completed "Urban Design Draft Report."

The report stated that "buildings should be energy conserving" to help Tanzania reduce its dependence on imported fuels. At Nyerere's insistence, there will be no air conditioning; rather, overhangs, recessed windows and tinted glass will be used to keep out the sun. In addition, the builders will experiment with solar collectors and windmills as ways of providing non-polluting power sources.

A central goal, the report said, is "maximum use of locally produced materials and labor" and a "minimum use of overseas funds." The architectural style is simple—no building will be more than three stories tall—so that low-skilled local labor can be used.

The central city of Dodoma is being built on a stepped terrace scheme to take advantage of the natural gentle slope of the land and to provide a sense of connection with the area's hills, ridges and rock outcroppings. Each terrace is one story higher than the preceding one, and they are joined by stairs, ramps and bridges.

The government's decision to move the capital from the port city of Dar Es Salaam to Dodoma was made in 1973 with the intention of developing this hitherto neglected region. Originally, construction was to take 10 years, but with financial and material shortages it is now running more than two years behind schedule.

When completed, the capital district should house 400,000 over nearly 6,500 square kilometers of land.

In addition to the United Nations, which has supported the capital plan since 1974, other aid has been given by Canada, Mexico, Australia and China. Foreign private investment is also being sought.

MARTHA HONEY

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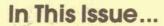
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The UN and the USA are working to include guarantees in their policies to protect importers of potentially harmful products 1

Antarctica and its resources, mineral and marine, are now seen as vital to the economies of several nations a status report from Chile 3

Colombia suspended its program of homesteading in endangered forests 4

India's Mrs. Gandhi has written her chief ministers and state governors advising them to make conservation part of the development process 5

The Indian government will revise its forest policy 5

Taiwan's first national park will have as its premier attraction a massive nuclear power plant 6

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An oil pipeline leak into Italy's Po River caused "enormous" damage, leading to demands for laws to prevent industrial pollution 8

SPECIAL SUPPLEMENT:

The UN Environment Program is battling the ennui of many member governments, which is slowing its programs and demoralizing its staff



Policies on exporting harmful products are in the works

WASHINGTON—Guarantees to protect the environment in international aid and trade have been included in two transnational codes of conduct now being debated at the United Nations. At the same time, the U.S. Congress, sensitized by increasingly shrill publicity over American companies "dumping" domestically banned products in overseas markets, is now considering legislation to regulate exporters and keep importers informed.





Under the auspices of UNCTAD, a Conference on the International Code of Conduct on the Transfer of Technology has accepted controversial language offered by the Tanzanian delegation. The language recommends that, as part of any transfer of technology, the exporting government help the recipient understand and avoid potential harm to its environment. Although the environment provision has been accepted, the code itself faces a rocky future with unanswered questions on whether it should apply to transactions within a country and whether it can coexist with stiff U.S. anti-trust laws.

According to chief U.S. negotiator William Brew, the idea behind the code is to "establish a stable environment so people of the world will know what can be done and what is good practice." Much of the sentiment for working environmental concerns into the code came from the Sierra Club, the Natural Resources Defense Council and the European Environment Bureau, and the adopted language bears the clear mark of these groups. Jacob Scherr, an NRDC lawyer, said, "The U.S. is recognizing a responsibility to disclose that certain products have been banned" for domestic use. Nonetheless, he added, "caveat emptor is still the prevailing norm" in the marketplace.

Environmental legislation . . .

PORTUGAL'S PARLIAMENT has passed a law requiring all large development projects to have an ecological impact study approved by the state secretary for the environment before going ahead.

It also approved a law prohibiting nuclear waste dumping in Portugal's 200 mile zone. The zone, which includes Madeira and the Azores, is the second largest territorial area in Europe—approximately one million square miles. Parliament also recommended the government follow a policy of stopping nuclear dumping at an international level.

These laws are considered first steps in environmental legislation and are largely due to the activity of a five man pro-eco group, the Popular Monarchists, who are part of the ruling Democratic Alliance.

VENEZUELA'S CONGRESS recently approved by law the text of the Amazon Treaty of Cooperation subscribed to by eight nations in Brasilia two years ago. By this treaty, Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Surinam and Venezuela agree to develop their territories in or adjacent to the Amazon basin, maintain a balance between economic growth and preservation of the environment and seek the rational use of natural resources.

Given the importance of communications, the nations will ensure freedom of commercial navigation on the Amazon and its international tributaries, and cooperate to improve waterways studying means to "eliminate physical obstacles impeding navigation." Treaty members are to work together on creating an infrastructure, particularly in the areas of communications and transport by air, river and land.

Coordination of public health services is one goal. Another is an exchange of information, technology and research, through establishment of research institutes and experimental stations.

THE HONG KONG government will soon introduce new measures to promote industrial safety in the colony, according to Commissioner for Labor Tony Hammond. The measures will include an increase in fines and a provision for imprisonment of persistent offenders, he said. The current fines, with a maximum of \$1,975 (HK\$10,000), are "a little out of date," he added.

Hammond also urged the creation of joint employer-employee safety committees at plant level.

About 67,000 industrial accidents were recorded in 1979 compared with 54,000 in 1978 and 50,000 in 1977.



Setting rules for the marketplace is the aim of another proposed code of conduct, this one before the UN's Commission on Transnational Corporations. Aimed at multinational corporations, the code asks companies to "protect and improve the environment and make efforts to develop and apply adequate technologies for this purpose." All information available on harmful effects of products or technologies and on restrictions placed on a company's products in other nations, must be relayed to the recipient country. The working group has yet to consider this language in formal discussion and differences of opinion abound, a State Department spokesman told WER. Two sticking points are whether to make mandatory an obligation of the multinationals to educate host countries on environment control technologies, and what responsibilities host countries in turn have to multinationals.



Keeping U.S. exporters from trafficking overseas in products banned at home has proven to be equally vexing. Although the Carter Administration appointed an interagency group to ponder the problem, horror stories continue to crop up. In 1977, infants' sleepwear treated with the carcinogenic substance Tris, banned in the U.S., found its way to third world countries. Farmers and buffaloes in Egypt died or fell ill after a similarly prohibited pesticide, Leptophos, was sold there.

These and other environmental tragedies have sparked Congress' first legislation aimed specifically at blocking the export of products disapproved for use in the U.S. Now before a House subcommittee, the measure would prohibit export of products that are restricted domestically, unless the Secretary of Commerce and U.S. regulators approve sale—and only after the importing country has been told of the possible hazards. This last proviso comes in response to many, including environmental groups backing the bill, who point out that, for some countries, the benefits of a pesticide or drug banned in the U.S. may outweigh the dangers.

Barely off the drawing board, the measure already has drawn sharp criticism from U.S. industry. Pillsbury Company, an exporter of agricultural products and processed foods, told Congress that certain products banned in the U.S., such as cyclamates, are freely sold and used beyond our shores. The bill also faces international practices that may be beyond its reach. Should a willing and informed country importing a banned product decide to export it elsewhere without full disclosure, the U.S. would be powerless—and might even be the recipient.

Some manufacturers send hazardous raw materials like asbestos overseas to be made into products that are then imported by the U.S., at no risk to American workers and at significant profit to the foreign country.

CHRISTOPHER JOYCE

The competition for Antarctic resources is heating up

SANTIAGO—When 12 nations signed the 1959 Antarctic Treaty in Washington, D.C., few had any idea of the real worth of that icy continent. Today, its marine resources, oil and natural gas alone are seen as vital to the economies of several treaty nations. The challenge of the Antarctic will be not just to explore or exploit these riches, but to do so without destroying its environment.

Recently those 12 nations* (along with a new member, Poland) and several international organizations (FAO, EEC observers, etc.) met in Canberra to put the final touches on an international convention, initiated by but not limited to the original treaty signatories, to try to form a natural resource regime which would protect marine resources in the Antarctic.

The main accomplishments of the convention were to list those marine resources considered vital and endangered, and to form a commission of treaty members to oversee marine resource exploitation. The main problem with the commission is that all major decisions will have to be made by consensus, difficult enough among nations that agree on values and resource principles but nearly impossible when dealing with nations as different in their resource policies as New Zealand, Japan, Poland, Chile and Great Britain.

Although the commission is a good step in the right direction, it will bypass some of the major problems which need to be faced in the Antarctic. These include overlapping territorial claims on the part of a group of the original treaty members, and claims to "strategic" interests on the part of some of the more militaristic members (Chile and Argentina are both run by military governments). Other nations, including the U.S., which signed the 1959 treaty, have demanded that an international regime be formed to control the region.

So far, seals and whales, the two major forms of marine life in the region discovered by Cook and overfished ever since, have been the only major species threatened. In recent years many national groups have begun commercial fishing of krill, which threatens not only that life form but all those that directly depend on it for subsistence. Fortunately, a few nations are having second thoughts about commercial krill fishing. Some European researchers have denounced the high fluorine content in krill, and Norway recently declared krill unfit for human consumption. The threat to the krill still exists, however.

Interest in the region is not based just on fish. As long ago as 1976 the U.S. Congress' research service estimated that natural gas deposits in the region were near 115 trillion cubic feet and that petroleum deposits of 50 billion barrels exist under the Ross, Bellinghausen and Weddell seas.

International cooperation ...

THE INTERNATIONAL DEVELOPMENT assistance institutions who agreed in February to. integrate environmental measures into all their development projects (WER, Feb. 11, p. 2), have now formed a working group to implement their declaration of principles.

They met this June in Barbados for the first time since signing the declaration to discuss how to assess the environmental implications of their projects, ways by which developing countries can be helped to integrate environmental measures into their development plans, and the creation of an institutional capacity for research, information, training and solutions.

There were also concrete suggestions, such as exchanges of technical assistance and docu-

Now that there is an agenda of issues, it is hoped that the heads of the regional banks will consider it at their September meeting in Washington.

"WITHIN A DECADE we will be the fourth or fifth largest industry in world terms," said Alfred Cooper, president of the Bureau International de la Recuperation, which represents firms engaged in recycling and reclaiming raw materials world-wide. He spoke at the BIR bi-annual congress held in Copenhagen.

BIR promotes international trade in reclaimed materials, facilitates study, research and the exchange of information. It also encourages ideas for reclamation by putting them before manufacturers.

Facts given at the congress show that some 45 percent of world steel production, 40 percent of copper, 50 percent of lead and 20 percent of paper manufactured now come from reclaimed, discarded or obsolete material,

Production of one ton of steel using scrap instead of ore saves 1.5 barrels of oil, for copper 7.7 barrels, for aluminum 29 barrels and for magnesium an impressive 52 barrels of oil.

BIR headquarters is at Place du Samedi 13, 1000 Brussels, Belgium.

IN MOST DEVELOPING COUNTRIES housing conditions continue to deteriorate, said UN Habitat director Arcot Ramachandran.

Speaking at a regional housing congress in Kuala Lumpur, he contested the "enormous" investment in new highways with the lack of finance to deal with ever-expanding squatter settlements.

Over the next 20 years, he warned, about 900 million new urban and rural dwellings, plus expanded public facilities (including more than 20 million miles of new or rebuilt transportation lines) will be needed.

^{*}Argentina, Australia, Britain, Chile, France, New Zealand and Norway have staked claims, some of which overlap. Belgium, Japan, South Africa, U.S.A. and U.S.S.R. signed, but made no claims and recognize none.

Forestry...

IRELAND HAS LESS LAND under forestry than any other country in Europe, only 5 percent of the total land area, and the voluntary Trees for Ireland campaign has urged an increase in the plantation rate from the present 25,000 acres (10,000 hectares) a year to 40,000 acres (16,000

The stepped-up program was suggested by the president of the organization, Nobel Peace Prize winner Sean MacBride.

He said the growth rate of Irish timber was the highest in Europe and a higher plantation rate would help employment, biomass development for electricity generation and alleviate the serious shortage of newspaper and newsprint.

Trees for Ireland was founded in 1948 to promote a more dynamic afforestation policy than has been pursued by the state.

PHILIPPINE PRESIDENT Ferdinand Marcos said he will stop logging in the country completely unless there is an effective program of forest conservation. Marcos made this warning after inducting officials of the Philippine Wood Products Association (PWPA) at ceremonies held in the Presidential residence recently. He urged the PWPA to help draw up an effective forest conservation program.

IN THE FIRST 18 MONTHS of operation, the International Council for Research in Agroforestry, with headquarters in Nairobi, has been asked by 30 developing countries to prepare agroforestry projects-using forest areas for agricultural production.

So far, ICRAF has drawn up two research projects for Brazil, one for Brazil and Colombia jointly, and one each for Senegal, Somalia,

Kenya and Tanzania.

Demonstration plots where agricultural crops are cultivated as lower-story species in forest plantations have been set up at three locations near Nairobi by ICRAF and the Kenya government's Forestry Department.

ICRAF is also working on collaborative efforts through a network of research institutions in

different countries.

Because of increasing interest in agroforestry, ICRAF is preparing a series of crop sheets on species suited to agroforestry systems. ICRAF says they will serve as an aid in the preparation of farming system projects and crop calendars for specific regions-preserving vital forest cover while also permitting crop production. For information, contact Dr. Kenneth King, Director, ICRAF, P.O. Box 30677, Nairobi, Kenya.

Japan has announced it will send an oil exploration ship to Antarctica this year, and Atlantic Richfield (ARCO) has been trying since 1970 to obtain a license from the U.S. government to explore along the eastern continental shelf. As petroleum needs become more acute, this demand will heighten and there will be more pressure to explore for both oil and natural gas and other mineral resources on the Antarctic continent. Coal has already been talked about in Chile and elsewhere as a possible exploitable resource, while other minerals are gaining in value daily and becoming more economically viable for such major expense. And Chile, among others, has already begun talking of the "strategic value" of its "southern waters." JOHN ENDERS

Colombia stops homesteading



in endangered forest areas

BOGOTA—Under pressure from the Colombian wildlife service Inderena, the Colombian government has decided to suspend colonization programs in endangered forest areas which are vital to the preservation of water resources and the ecosystem.

No longer will land titles be approved or credit provided for homesteaders in such zones as the Darien, the Andes Mountains and certain parts of the Sierra Nevada range near Santa Marta on the Caribbean coast. Inderena is particularly concerned about the Darien rain forests along the Colombian-Panamian frontier. Destruction in the region has accelerated in recent years with the invasion of colonists attracted by construction of the last section of the Pan American Highway linking Alaska and Tierra del Fuego.

Inderena director Sergio Duran said that over eight million hectares of natural forest have been destroyed in Colombia in the past two decades, "a process that must be stopped."

The Agustin Codazzi Geographical Institute will complete a detailed map of the country's forest reserves by the end of the year. It will serve as the basis for policy decisions by a tripartite commission representing Inderena, the agrarian reform institute Incora and the Caja Agraria, or agrarian bank. Their aim will be to end current anarchic colonization by directing settlers, through government incentives and disincentives, to the sparsely populated eastern plains, or "llanos," with 25 million hectares suitable for farming and cattle ranching. "Some soils are meant only for forests," said Duran, "and they should stay that way, to produce water and lumber.'

Duran also announced a change in Inderena reforestation priorities from pine to fruit trees to encourage peasants to plant more trees. Pine plantings have not been successful, he said, because they take longer to mature and do not provide the peasant with a source of food. PENNY LERNOUX

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What's the matter with UNEP? An analysis from Nairobi

NAIROBI—Eight years after its founding, the United Nations Environment Program (UNEP) still cannot secure an all-out environmental commitment from many large and small nations.

Back in 1973, UNEP was launched in an atmosphere of euphoria. As the first world body to coordinate and direct research and action on the environment, it held out a rosy promise of a better life for everyone—especially for future generations.

But today, with much of the initial enthusiasm gone, UNEP has to battle with world economic crises and political confrontations, literally pleading with the world's nations to spare some of their time and their cash to clean up the seas, to halt the destruction of forests, to counter desertification and to preserve what's left of their own natural heritage.

"Put simply, day-to-day living has become such a problem that people and governments don't want to think about what's going to happen to the environment 100 years from now," a disillusioned UNEP official told WER. "It makes our job harder than ever—and it doesn't help morale among the staff here."

In its eighth year, UNEP is still struggling to get the cash it needs to carry out its activities. It is \$24.6 million short of the \$150 million target (a modest enough figure: what the world spends in just over two hours for arms) for the Environment Fund in the 1978-1981 period.

UNEP is not willing officially to accuse its member-states of apathy, but every year its Governing Council produces arguments and internal struggles about how much cash UNEP needs, how much it can spend and who should foot the bill.

The special fund set up at the 1977 Desertification Conference to finance desert projects remained empty until this year, when Mexico made a first, small contribution to it. When UNEP asked 159 governments for information on their national environmental status, only 20 responded.

It's not surprising that UNEP executive director Mostafa Tolba should warn the recent Governing Council meeting in Nairobi that there is no point in developing more plans for action unless there is going to be cash to finance them.

Tolba has suggested that UNEP should develop a system of "concentration areas," rather than trying to meet the often conflicting needs of large numbers of individual states who tend to see their own problems as more important than other people's. But he has had no success so far.

UNEP's make-up is cumbersome, slow and ineffective. It is not an executing agency implementing its own programs; it acts as a catalyst so other agencies—governments, UN bodies, international organizations—will implement environmental programs.

Individual governments offer staff to UNEP who are sometimes top class—but at other times not. Individual countries want to see

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their nationals working at UNEP, but when top-class manpower is scarce the most able people are occupied at home.

Morale in UNEP is low. Tolba has been accused by his own staff of failing to give the leadership they need and of interfering directly in the work of skilled professionals. He blames the rapid turnover of staff, particularly in administrative areas, for many of UNEP's difficulties.

Tolba lists some examples of UNEP's successes—the regional seas program (with the Mediterranean clean-up setting an example that other areas are following); a now-wide acceptance that economic and environmental plans interlock; a program on cost/benefit analysis of environmental protection measures; a declaration by multilateral development financing agencies that environmental considerations will be incorporated in their projects; the INFOTERRA system; the plan of action to combat desertification.

His annual "State of the Environment" reports get wide publicity and trigger serious consideration of problems like carbon dioxide, firewood, toxic chemicals, resistance to pesticides etc. But simply because he must list all the pros and cons in these reports, he is accused of reducing dramatic situations to dull recitals. He cannot, for instance, say definitely that the world must act NOW on carbon dioxide—he can only say that more research is needed before substantial conclusions are reached.

Yet nearly half the world's rain forests have already been destroyed, and every year the desert claims six million hectares of arable land. Over 1,000 animal species and 25,000 plant species are threatened with extinction. Third world countries are still being used as "dumping grounds" for hazardous wastes.

One of UNEP's problems is that, as a new UN agency, it has to move into areas that other, longer-established agencies regard as their own. "A lot of existing agencies are jealous. They don't want UNEP to move in," said Gary Gallon, director of the Environment Liaison Center in Nairobi (which serves nongovernment organizations throughout the world).

The same thing has happened, Gallon says, when governments have set up their own environment departments—they have difficulties with other ministries.

He does not believe that UNEP has failed. "It is still in its formative stage. I expect it to take at least a decade to establish itself. After all, UNEP has to prod governments, to make itself a nuisance; that doesn't make it popular."

Gallon says the view of the NGOs is that UNEP is far better than nothing—even though, like other UN organizations, it is bogged down with procedure and inertia.

Japan's Permanent Representative to UNEP, S. Saiki, commented: "When UNEP steps out of its coordinating and catalytic role, it runs the risk of becoming too deeply involved in the problems of development and politics to achieve its own ends successfully...UNEP should remind itself of its primary role and the priorities to be followed in carrying out that role."

In short, the arguments about the effectiveness of UNEP persist, but the agency can only make progress with the support of individual governments and national and international organizations—many of whom resent being pushed to act on environmental matters.

CHARLES HARRISON

ISSUES

COMPETITION

FUNCTION

Mrs. Gandhi strongly urges conservation in development

NEW DELHI—India's Prime Minister, Mrs. Indira Gandhi, has written to all the state governors and chief ministers suggesting that "for every tree cut, a new one should be planted to preserve the environment of the country."

In her letters she advised: "Devote some time for the conservation of the environment. It should be as much a part of the developmental process as the utilization of national resources. It is the joint responsibility of right-thinking people."

Among other suggestions she made were massive programs of social forestry involving schools and tribal populations, a system of rewards and incentives for plantations on steep hillsides and in catchments and cleared areas, and better security and intelligence to stop the smuggling of precious trees and endangered animals.

A committee has already been formed in New Delhi to recommend legislative and administrative measures to maintain India's ecological balance. She wanted immediate action by state governments to be taken against poachers and forest contractors to check the cutting of trees and killing of animals for profit.

R. MURALI MANOHAR

India is revising its forest policy

NEW DELHI—The Indian Government is planning to revise its forest policy, giving more weight to the role played by primitive forest-dwellers, the tribals.

For a long time it was thought that the tribals were responsible for excessive tree-cutting, thus reducing the number of forests in the country. But further study found that many tribals have taboos and other customary restrictions on the wanton destruction of forests. The tribes of Ghota Nagpur in Bihar maintain a sacred bush as a symbol of their community identity. In Orissa no tribe would cut a fruit tree. Among the Angami Nagas in Nagaland anyone who cuts a tree must plant a substitute tree. The Manipur tribals go a step further by not only maintaining the forests but also running schools from the income earned from the sale of forest produce. The Chipko Movement in Uttarkhand (Uttar Pradesh) is directed against deforestation of catchment areas.

About a year ago tribals in Singhbhum (Bihar) protested against the substitution of teak plantations for their indigenous sal trees. The policy was subsequently reversed, but their agitation still has not died down completely. Nevertheless, in Bastar (Madhya Pradesh) Swedish aid will be used for monoculture plantations for paper and pulp manufacture, replacing the diversified forest that has been the bulwark of the tribal economy.

To make way for industries, many forests in Bihar, Bengal, Orissa, Madhya Pradesh and Andhra Pradesh have been indiscriminately cut down, ruining the tribals' economy.

The new national forest policy, conservationists argue, should be balanced: forest areas should be increased, and multi-dimensional use of the forests, especially by local people, should be fostered.

R. MURALI MANOHAR

On the Subcontinent . . .

ONE OF THE RICHEST TEMPLES of the world, Tirumala in India, has allocated one hundred million rupees (\$12.5 million) to restore the ecological balance of the countryside surrounding it.

A temple spokesman said the indiscriminate felling of trees has destroyed the beauty of the 27-kilometer area, and it has also disturbed atmospheric conditions in and around Tirumala.

The program envisages development of the landscape and afforestation on a massive scale over a period of from 10 to 15 years.

Temple authorities say they will not fell trees for fuel. They will also try to curb private cutting in the forest around Tirumala. In return, the forest department has agreed to meet the entire fuel requirements of the temple.

INDIA'S UNIVERSITY GRANTS Commission for the first time has allocated about \$100,000 for wildlife and ecology projects. The UGC has set up a committee to suggest recommendations for promoting wildlife studies in universities.

The commission has also organized seminars in Shillong (East India) to bring together scientists from universities, forest departments, the Natural History Society and wildlife boards to discuss emerging and urgent environmental problems. These seminars have helped in identifying specific projects which the universities can take up on their own or in collaboration with the wildlife boards.

TO CUT THE WATER LOSS due to evaporation, the city of Jhansi in India's Uttar Pradesh state plans to cover the reservoirs which supply its drinking water with a chemical film, Commissioner Arvind Verma told WER.

He said that Cetyl Alcohol would be sprayed on the reservoirs of Mata Tila and Palmj dams.

In summer months, three feet of water over an area of 81 square kilometers is lost through evaporation from Mata Tila reservoir.

"Even if we can save 15 to 20 percent of this water, it will be worthwhile," he said.

THE BANGLADESH GOVERNMENT is facing opposition from local ecologists because it plans to develop the country's only coral island, St. Martin's Island, into a modern tourist resort.

This is the first time government policy has been opposed on environmental grounds.

The island, 13 square kilometers and 160 kilometers from Cox's Bazar port in south eastern Bangladesh, is presently populated by about 2,000 settlers engaged in agriculture.

The society intends to lobby in the national parliament for legislation to preserve the present natural environment of the island.

Nuclear Power ...

HUNDREDS OF POLICEMEN swept through a projected underground nuclear waste dump in northwest Germany in June to clear several thousand protesters from the Gorleben area.

The squatters had been occupying the Gorleben site, southeast of Hamburg and close to the East German border, since early May. They maintained that the plan to store spent radioactive rods from West Germany's atomic power plants in the Gorleben salt caves is not safe.

The occupation by protesters was designed to prevent further test drilling to establish whether the site is suited to such a project.

Some 1,500 protesters, who had been camping at Gorleben for at least a month, were joined by about 2,000 others, who joined the group when it became known that the police were prepared to end the "illegal occupation."

The demonstrators refused appeals to evacuate the site voluntarily and declared that they would offer passive resistance to their removal. There were no reports of violence.

GROUND WILL BE BROKEN this year for Poland's first 440-megawatt nuclear power generating unit at Zarnowiec, north of Gdansk, the Polish news agency PAP reported.

The plant is scheduled to produce electricity by the end of 1985. The second generating unit is to be installed in 1986.

Following this, Poland will start installing 1,000 megawatt units which will function as the core of the nation's nuclear power system. The first such larger unit is expected to go into operation at Zarnowiec in 1987.

SEVERAL VILLAGES near India's nuclear fuel complex have been "seriously affected" by water pollution. As an urgent measure, the Andra Pradesh state has started supplying drinking water to the villages.

A CLAN OF AUSTRALIAN ABORIGINES, the Yankunyatjara tribe, say they have been affected by a "black mist"—radiation—from atomic bomb tests at Maralinga, South Australia, in 1953.

The South Australian Health Commission is expected to proffer a general health report to the government before deciding if the federal health ministry should be involved in an investigation of the claims. Britain tested atomic bombs at remote Maralinga in the 1950s and 1960s.

The Aborigines claimed that 45 members of the clan were enveloped in a "black mist" after a detonation, which resulted in sickness and death. The clan was camped 170 kilometers north of the Elm Fields test site at that time.

A medical team has been sent to examine the tribespeople.



Taiwan is building a nuclear plant in its national park

TAIPEI—Development of Taiwan's first national park is going ahead, even though a nuclear power plant is being constructed right in the middle of it.

The side-by-side projects, a seemingly impossible mixture from an ecological point of view, are indicative of the conflicts of interest and the resulting compromises that have to be made on this over-crowded island. There is no doubt, however, that in any clash of wills, economic development is given priority. Despite the arguments from environmentalists, the government has embarked on a full-scale nuclear power program which will supply more than a third of Taiwan's electricity needs by the time it is finished in the year 2000.

The plan to inaugurate the park was set in motion in 1976 by the Tourism Bureau. By the year 1984, the whole southern tip of the island, covering an area of 170 square kilometers, is scheduled to be in the park. The area has some of the finest beaches and seascapes in Taiwan, a pristine tropical forest containing flora and fauna not found elsewhere on the island, fantastic rock formations and, offshore, a long stretch of unspoiled coral reef.

Even before the project got off the ground, the Taiwan Power Co. had completed a survey which showed that the Nanwan area, right next to the finest beach in the park, was also suitable for its third nuclear power plant. It had, by Taiwan's standards, a low population density, even though the medium-sized town of Hengchun is only 20 kilometers aways. Its other recommendations were an abundant supply of sea water for cooling the reactors, and firm geological strata not prone to earthquakes which afflict much of the rest of the island.

To counter opposition from the tourism sector and academic institutions, the power company argued that the only environmental effect would be a slight warming of the sea water in the immediate area of the power plant's outlets, pushing it to 32 degrees centigrade compared with the normal 25-30 degrees. But a survey by the National Taiwan University has shown that this might be enough to damage the coral reef.

Dr. Lin Jun-yi, chairman of the biology department at Tunghai University, pointed out that power company estimates are based on only two generators, 950 megawatts each, which will be installed by the end of 1985. Plans call for the addition of up to four more generators of even bigger capacity. "No one really knows what the effect of a large volume of hot water might be, assuming there is no nuclear leakage," he said.

The private sector in Taiwan has proved to be particularly concerned about the effects on the area's tourist potential. Several hotel groups in Taipei reportedly scrapped plans to build resort properties close to the beach, as the original blueprint for the national park envisaged.

Whatever happens, there is no chance that the nuclear power plant development will be abandoned or changed. Total invest-

ment in the project will be in excess of \$1.6 billion, and construction is already half completed. While refusing to make any official comment, power company officials say privately that with energy needs expected to grow at 11 percent a year in the future, the economy would be severely imperiled if the present reliance on imported oil is not reduced. For the time being, at any rate, nuclear power is regarded as the only feasible alternative. SPECIAL TO WER

Austria's government wants to reverse the nuclear power ban

VIENNA—The Austrian government is trying to create a climate in which the 1978 decision never to use atomic energy can be reversed.

On November 5, 1978, Austrians voted, by a majority of less than 1 percent, against the use of atomic energy. Chancellor Bruno Kreisky, a supporter of atomic energy, said he regarded the referendum as a personal defeat. In 1979 The Austrian constitution was changed in accordance with the promises made before the referendum, banning the use of atomic energy.

The referendum left the Austrian government with an atomic power station, Zwentendorf, already built and charged with radioactive elements.

Now the government-controlled electricity boards have launched a publicity campaign in which they state they cannot guarantee future electricity supplies. Trade union president Anton Benja has said that he is in favor of a new referendum on the use of atomic energy without which, he claims, jobs are endangered. Austria has an unemployment rate of less than 3 percent, and full employment is the government's prime target.

Both major parties, the Socialists and the Christian Democrats, say they would not be against a new referendum if they knew beforehand that a two-thirds majority in parliament favored atomic energy. This would be necessary to change the constitution once again. The smaller Liberal Party remains adamantly against atomic power in the present circumstances.

Austria is certainly not at the end of its energy reserves. It can cover 25 percent of its own oil requirements in an emergency and has just concluded a contract making Saudi Arabia the country's second major oil supplier after Iraq. A new natural gas field was found last month and is believed to be substantial. Hydroelectric reserves have never really been expoloited. There are contracts under which Austria will receive new energy supplies from Yugoslavia in return for help in building power stations and operating

Zwentendorf, however, is a question of prestige for the socialist government in general and Chancellor Kreisky in particular. But while the Austrian chancellor has made no real secret of the fact that he would welcome a new referendum, the newly re-elected Austrian President, Dr. Rudolf Kirchschlager, who seldom interferes in political affairs, said he does not believe that a referendum on the same subject can reasonably be held twice within a period of only a few years. SUE MASTERMAN

In Europe ...

WEST GERMANY'S FIRST VOLUNTARY car-free Sunday—promoted with weeks of campaigning by Interior Minister Gerhart Baum and many environmental groups—was a dismal flop from clogged Alpine highways in Bavaria's south to jammed parking lots along beaches on the North Sea.

Police generally reported normal, that is extremely heavy, weekend traffic on the target day: June 8th. West German television gave generous coverage to "car-free Sunday," interviewing drivers, all of whom had convincing reasons why they were behind the wheel. It also focused on sharp disputes between auto drivers and bicyclists blocking busy intersections.

The campaign was not intended to be an energy-saving measure; it was being promoted for environmental reasons. But German motorists delivered a clear message: Let someone else

NEARLY 200 METRIC TONS of mackerel-shark imported from Japan and containing a level of mercury 10 times above that legally allowed, were sold-and eaten-in Italy in the first months of this year, authorities reported.

Health officials ascertained the illegal level of mercury and seized about one ton of the frozen fish from a wholesale dealer in Ravenna-after most of the fish had been marketed and consumed. Officials in the Adriatic town said there were no immediate reports of food

The mercury-carrying fish were discovered during routine tests on samples of imported goods.

Two years ago two foreign tourists died and several were poisoned and hospitalized near Venice after they ate poisoned frozen fish imported from an Asian country.

THE PORTUGUESE ENVIRONMENTAL STUDY Commission has completed the first part of an

atmospheric pollution survey of the Lisbon industrial belt. The program is subsidized by the UN Development Program and World Health

Organization.

The commission made a complete inventory of the principal factories in the area, one of the most polluted in Portugal. By evaluating each factory's polluting effect, the commission can now propose concrete measures to reduce the emission of dust and gases through improved technology.

Transit in Lisbon's jammed city center will be the hardest problem to tackle. The study shows that between 120 to 150 kilograms of sulphur dioxide are emitted per kilometer per day compared to the 30 to 60 kilograms of SO2 per day in the city's outskirts.

Water quality...

IRELAND has remained remarkably free of major oil pollution despite its extensive coast-line and proximity to major shipping and tanker routes.

The annual report of the nation's Advisory Committee on Oil Pollutions says that the east coast had seven reported spills in 1979, while there was only one minor incident on the west coast and none on the northeast in either 1978 or 1979. There were six on the south coast, one of which involved the ill-fated tanker Betelgeuse at the Gulf Oil terminal in Bantry Bay, where 51 men died in an explosion aboard ship.

The committee noted that aerial spraying—59,000 gallons of dispersent—was successful and stated that pollution from the disaster was much less than would normally be expected.

THE PHILIPPINE BUREAU OF FOREST Development has launched a campaign to prevent further deterioration of the country's watersheds. It will educate people living within watershed areas on the proper use of land to check excessive water run-off and soil erosion, and provide funds and make legislation to improve watershed management. Several watersheds have been destroyed by logging, mining and forest fires, which has led to flooding and environmental imbalances in some areas. It is feared that continued destruction of watershed areas will shorten the life of existing and planned hydroelectric facilities.

IT'S NOT A VOYAGE, but a T.R.I.P. to the bottom of Australia's sea—a Tethered Remote Instrument Package.

T.R.I.P., developed over five years by Queensland Fisheries Service scientist Dr. Gerry Goeden, is computer-controlled survey equipment which transmits television pictures of the seabed to an on-board ship monitor. T.R.I.P. operates 24 hours a day and can go to depths of 350 meters.

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An oil pipeline leak despoils ltaly's Po River

MILAN—Italy's latest environmental disaster—a 2,000 metric ton oil leakage from a pipeline into the Po river—has renewed demands for precautionary measures in industrialized areas.

Mario Capanna, a councillor from Lombardy, urged a law on the U.S. model, requiring an environmental impact assessment for any industrial installation. "Such a law would allow regional authorities to veto dangerous installations, rule modifications to original projects and plan emergency measures in case of any incident," Capanna said.

The pipeline leak was not reported to authorities for nearly 10 hours. By then, a 20-kilometer-long slick was floating down Italy's longest river, which flows into the Adriatic sea south of Venice.

The pipeline break, allegedly caused by an earth-moving machine, and the subsequent leakage polluted 77 kilometers of river bank—out of a total 652 kilometers—between the towns of Pavia and Cremona in northern Italy. The pipeline goes from the port city of Genoa to a Conoco (U.S.) refinery.

Conoco technicians and firemen pumped some of the oil into tankers, and teams of workers spread chemical solvents. Special equipment was used for removing oily sand along the banks. However, Lombardy region ecologists claimed damage caused to fish and flora was "enormous."

"We have been unable to make immediate estimates, but we already know that river plankton along the polluted section have been destroyed and fish poisoned," an official of the Po river authority said. There was concern that drinking water and purification systems might be affected.

Conoco, which claimed that no more than 400 tons of oil leaked into the river, is being sued by regional authorities, who gave the higher estimate of the leakage.

Capanna said payment for damage caused to the environment was no solution. "Measures for preventing any pollution are needed," he said.

Northern Italy is crossed by a network of hundreds of kilometers of oil and gas piplines, not only because of the refineries based in industrial areas but because major pipelines carry fuel from Libya to Holland and the Soviet Union. Casual breaks to pipelines are not unusual. Some years ago an oil leak polluted an aqueduct and exploded, causing severe damage to a village near Voghera in northern Italy. Last year another oil leak and subsequent explosion killed two persons in a countryside area northwest of Milan.

PIERO VALSECCHI



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A bonanza for Brazil's fishalcohol swill is fine food

RIO DE JANEIRO—A troublesome waste by-product of Brazil's Ambitious National Alcohol Program (Proalcool) could prove to be a boon to the country's fledgling commercial fishing industry.

The fishing bonanza would be realized by piping the *vinhaca*, or swill, produced during the distillation of sugarcane, to the ocean at selected points up and down the coast. The swill, which is highly pollutant when dumped into small lakes or steams, is not toxic and is a nourishing food for plankton and fish when dumped at sea.

Every liter of alcohol produced yields 13 liters of an unwanted organic waste, or swill. Hence, all that fuel alcohol targeted for 1985—10.7 billion liters—will also produce a whopping 139.1 billion liters of swill, a potential headache almost as big as the energy crisis itself.

Alternative means of waste disposal have been suggested, although costs, desirability and possible benefits of the various systems are still unresolved. The fish feeding idea is among the latest—and most likely—to emerge.

Cristovao Mark Ostrovski, an environmental engineer with Rio de Janeiro's Fundacao de Tecnologia Industrial (Industrial Technology Foundation) said his organization is part of a group researching the possible construction of a swill pipeline to carry the waste from points where Proalcool distilleries are concentrated to the ocean for selective dumping. Most of the distilleries, like most of the Brazilian population, are located within 100 kilometers of the seacoast.

The dumping sites would have to be carefully selected, both to facilitate fishing and because "all that brown water would not be aesthetically pleasing," the Brazilian-born and Canadian-educated environmental engineer commented.

Cost surveys of various swill disposal systems show the pipeline to be the cheapest per liter of alcohol produced, Ostrovski said. Other alternatives, such as processing it in aeration ponds to produce fertilizer or in biodigesters to produce methane gas, are more expensive because of the initial cost of the huge ponds or industrial biodigesers required. Some swill disposal or treatment systems would cost as much as four or five times as much per liter as would the swill pipeline.

Funds for financing Proalcool distilleries are more than



Recycling . . .

EAST GERMANY AND CUBA have developed a process for making textile fibers out of bagasse, the pulp left after sugar has been extracted from cane, the official East German Neues Deutschland has reported.

It said Cuba, which produces 9 million tons of bagasse a year, was converting a factory to

produce the fiber.

BRITONS SIPPING THEIR PINT of beer can congratulate themselves on stimulating research into energy conservation. Under the government's Energy Conservation Demonstration Projects Scheme, Scottish & Newcastle Beer Production Ltd. have introduced a heat recovery scheme in their keg-cleaning operation which is saving 46 percent of the energy costs.

Heat is recovered from the final hot water rinse and transferred to the initial rinse of the next washing cycle. There have been additional benefits in reduced water consumption and effluent disposal costs. Further modifications and improvements are in hand to increase energy efficiency even more. In return for up to 25 percent support for capital and installation costs, plus full monitoring costs, the government can pass information about such energy saving schemes throughout the industry.

THE MATHURA OIL REFINERY in northwest India, due to open in June, had sparked off a fierce international controversy because of the threat it poses to the Taj Mahal monument. Now India's irrigation minister says effluent from the refinery will be used for irrigating fields nearby, where it will be carried through pipes.

According to Bir Bahadur Singh, this will prevent pollution of the Yamuna river (which flows through Delhi) and also boost crop

vields.

The cost of laying the pipelines, he feels, should be borne by the refinery, which has already cost \$500 million.

THE ASSOCIATION OF PETROLEUM Re-Refiners is sponsoring the 4th International Conference on Used Oil Recovery and Reuse, Sept. 28-Oct. 1, at Caesars Palace, Las Vegas, Nevada, U.S.A. It is co-sponsored by the U.S. Department of Energy and the National Bureau of Standards. For information: Association of Petroleum Re-Refiners, 2025 Pennsylvania Ave., N.W., Suite 913, Washington, D.C. 20006, U.S.A.

adequate since the alcohol program has a tapline to the National Alternative Energy Development Fund, which is fed in turn by a special tax on all petroleum derivatives. However, Brazil is chronically short of capital and Brazilians are becoming increasingly conscious of alternative energy cost-benefits.

Although alcohol distilleries getting Proalcool financing are reguired to provide approved forms of swill disposal, unauthorized dumping in streams and rivers is still common among some distilleries. Swill in concentrated form uses up the oxygen in

streams and kills fish and other marine organisms.

Ironically, when the "polluted" water from such contaminated streams or rivers reaches larger bodies of water capable of absorbing the waste, a sharp rise in the population of plankton, other organisms and fish is noted.

"The ocean would eat this stuff up, and it would be a tremendous boost to fishing," Ostrovski said. He explained that although Brazil has an extensive coastline and a fledgling commercial fishing industry which the government is trying to foster, fish stocks here are not as rich as along many other coasts. This is because the Brazilian coast has no upwelling current to raise organic matter off the ocean floor and attract top- and middlelevel feeding fish.

To rectify that oversight of nature, Admiral Paulo Moreira da Silva, director of Brazil's Institute of Marine Research, has long advocated "fertilizing" the sea to improve fishing or creating giant fish marinas like cattle feed lots to fatten fish in captivity. It all sounded like another visionary Brazilian dream. Now, perhaps, the unwanted swill from fuel alcohol distillation could provide the

raw material for accomplishing both programs.

JAMES BRUCE, GEORGE HAWRYLYSHYN



Costa Rica's bishops preach environmental activism

SAN IOSE, Costa Rica—The "Asociacion Costarricense para la Conservacion de la Naturaleza," ASCONA, one of Latin America's most dynamic conservation NGOs, has initiated a churchsanctioned conservation program which could have continentwide implications by bringing wider public attention to natural resource problems.

Some time ago, ASCONA officials met with the Catholic Bishops of the Episcopal Conference of Costa Rica. These sessions were devoted primarily to a discussion of the country's major conservation problems, their socio-economic consequences, and an appeal by ASCONA to the clergy for cooperation, which was readily obtained.

Within a relatively short period of time, a document was

prepared by the bishops, which was reviewed and revised by ASCONA technicians for final ratification by the clerical group. The bishops called a press conference on the date of the religious festival in honor of "San Isidro Labrador," the patron saint of farmers, and issued a "Pastoral on Conservation of Natural Resources," which has already had effect nationwide.

The Pastoral begins with a review of the country's major problems such as: deforestation, erosion, river contamination, slash and burn agriculture, etc., and links these problems with the Bible and religious precepts relating to conservation of natural resources. The document also refers to the Puebla, Mexico, encyclical which came out of the meeting of the entire Latin American Episcopate a couple of years ago. The Puebla document called on the entire Latin American continent to "do everything necessary to avoid the devastating effects of uncontrolled industrialization and an urbanization process which is taking on alarming proportions."

The Pastoral of the Bishops of Costa Rica, however, gets right down to business with the following recommendations:

- That a prevention policy be clearly defined to stop irrational natural resource destruction.
- That government institutions collaborate and cooperate in more coherent form and integrate the farmer in their decisions on the social and economic needs of the country.
- That a land-use plan be clearly defined to preserve forest areas and watersheds.
- That antiquated and confusing legislation be corrected and brought up to date.
- That owners of mountain property be given incentives to maintain their land in forest, avoid the use of rivers for industrial wastes and residues, etc.
- That the use of pesticides be rationalized and placed under strict biological control, and that the farmer be educated on proper utilization of agro-chemical products.
- That industry be obligated to install preventative systems in accordance with existing legislation.
- That urban growth be properly planned without the loss of rich agricultural soils.
- That the destruction of mangrove, wooded areas and watersheds be avoided and that reforestation programs be encouraged at the "campesino" level.
- That the Ministry of Education play a leading educational role to obtain democratic support so that the laws will be enforced without the need for violence and that environmental investigation and education programs be developed at every level.

The encyclical ends with: "We, the Bishops of Costa Rica, concerned for the welfare and development of our people, cannot remain indifferent to the problems which are constantly impoverishing us more and more, and which are soluble, above all, if we realize that, as men, intelligent human beings, we are those to whom God has confided this marvelous planet as our habitat..." It further calls for the support of all Costa Ricans to conserve the environment and makes a plea to national authorities to enforce the laws pertaining to conservation.

The Pastoral was published in its entirety in the country's

In Latin America ...

EIGHTY PERCENT OF ALL CULTIVATED lands in South America and the Caribbean suffer from some degree of erosion, said Jose Emilio Araujo, director general of the Inter-American Institute for Agricultural Cooperation. A Food and Agriculture Organization (FAO) report confirmed that the trend continues, largely due to overcutting the region's forest lands. It said up to 10 million hectares are severely affected.

The statements and reports were made at a ministerial-level meeting, the Eighth Inter-American Agriculture Conference, held in Santiago de Chile in April. It was attended by representatives of 27 countries and observers from several international organizations.

As a result of land abuse and mismanagement, it was reported that 40 million inhabitants of the Americas suffer from problems due to malnutrition.

TOXIC FUMES from the heavily industrialized and populated Valley of Mexico are sweeping out of the valley, endangering forests, vegetables and flower-growing industries, a Mexican botanist has warned. Unless carbon monoxide discharges from automobiles are reduced and factories convinced they must eliminate air pollution, new varieties of plants will have to be found and planted, L.I. deBauer, botanical disease specialist at the Agricultural Postgraduate College in Chapingo, Mexico, told a Mexico City seminar on the environment.

WITH ONLY A TRACE OF RAIN since January, residents of Haiti's capital and the surrounding regions are feeling the effects of a severe drought.

Meteorologists say that severe deforestation and the subsequent exposure of white reflective limestone rock may be a contributing factor as it reflects a substantial amount of solar energy skyward, thus preventing the formation of rain clouds.

Many areas of Port-au-Prince are presently out of potable water and residents are paying a premium to have water trucked in from questionable and frequently highly contaminated sources.

The Haitian government has declared this the "year of the tree" and is encouraging essays, songs and similar solutions for deforestation, but the replenishment of trees is almost non-existent.

DURING 1981, COSTA RICA plans to expand the number of wildlife refuges in the country to cover many important areas for seabirds and sea turtles.

Environment & Industry...

THE COLOMBIAN SUBSIDIARY OF TEXACO has been denounced by one of Colombia's leading environment defenders, lawyer-journalist Albert Donadio, for contaminating the air at the company's El Guamo refinery in the central part of the country. According to on-site reports by Donadio, the refinery's residual debris is dumped untreated into a lagoon near the refinery's storage tanks, presenting a hazard to both the tanks and a town less than a mile away.

Residents told Donadio that the lagoon catches fire on an average of one to two times a year. The last conflagration, witnessed by Donadio in March, threatened to blow up the storage tanks. During the 24 hours needed to put out the fire, the town was enveloped in black smoke.

Under Colombia's new penal code, polluting the air is a crime punishable with up to six years in prison and a \$40,000 fine.

THE WORLD BANK has published a manual of environmental guidelines for the pulp and paper industry. Its purpose is to provide general guidance for those who are planning, starting up or assessing pulp and paper plants. The 101-page handbook gives an overview of the industry, discusses environmental input and assessment methods. It looks at water, air and land pollution control, environmental laws and regulations, and provides an environmental planning checklist. For a copy of "Environmental Considerations in the Pulp and Paper Industry," write: Office of Environmental Affairs, The World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

FOURTEEN LEFTWING TERRORISTS have been charged in connection with the killing of Enrico Paoletti, industrial director of the Swiss-owned Icmesa firm, a victim of the first "ecological assassination" in history.

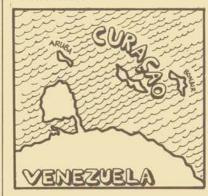
Milan magistrates investigating the case reported that three men and a woman, convicted members of the terrorist group Prima Linea or Front Line, were charged with the actual murder while 10 others were charged as accomplices and for illegal possession of arms.

Paoletti was assassinated in February 1980 in "retaliation" for the Icmesa dioxin leakage which led to evacuation of the town of Seveso.

leading newspaper, La Nacion, and in the "Eco Catolico," the clerical press organ, as well as being well reported on television, radio and in other local newspapers. And clergy are delivering sermons from their pulpits on this theme throughout Costa Rica. Although ASCONA played a discreet role in this strategy, it is producing 5000 copies of the Pastoral for distribution throughout the country.

While Costa Rica does not rank among the most conservatively religious countries of Latin America, the Church is highly respected and plays an important role in the countryside. The clergy also reaches a large segment of the country which is generally beyond the range of broad environment educational programs, namely, the "campesino," or small farmer, and the rural populace. This new approach in this part of the world, with the Church as an ally, could prove a significant tool throughout Latin America.

MURRAY SILBERMAN



Its oil firm tax illegal, Curacao nowfaces bankruptcy

PORT-AU-PRINCE, Haiti—The Curacao government has been shaken by a court decision which, if implemented, may bankrupt the island.

In a judicial decision, the Netherland Antilles court of appeal turned over a lower court decision on the legality of an environmental tax levied on the Curacao Oil Terminal. The court ruled that the transshipment facility was eligible to reclaim the Nfl 80 million (\$44 million) it has been paying into the island treasury at a rate of a little over Nfl 20 million a year.

The decision is, in effect, a declaration of bankruptcy for the island, which is already in debt. The island has based past and present budgets on the tax, and it was used for everything other than improving the environmental pollution attributed to the oil facility's presence.

Said Reb Ves, Managing Director of Shell's local companies, "I have the bankruptcy of the island in my hands." Originally the company was given a 10-year tax holiday by the central government in 1974 only to have a stiff environmental tax imposed on it once the oil facility started to show a profit.

Central government MPs are now to discuss a change in the law and may pass retroactive legislation. Curacao may also take the case to the highest court of appeal in The Hague.

Oil company officials pointed out that they offered to make a voluntary early contribution at this time and in the past but only in the neighborhood of Nfl 1 or 2 million (\$500,000 to 1.1 million) a year, to be applied to environmental pollution controls. The island rejected this as "ridiculous."

ARTHUR CANDELL

UNEP is facing a serious cash crisis and must cut back



NAIROBI—The United Nations Environment Program (UNEP) is facing its most serious cash crisis and must cut back on its spending. This is the message from the annual UNEP Governing Council (GC) meeting, held in Nairobi recently.

The U.S. and other Western delegations warned that there is no prospect that UNEP will receive the \$120 million proposed as a target for its environment fund in 1982-1983. A more realistic target is \$77 million, they said.

Debate on the target figure took up much of the GC with developing countries opposing a reduction. But the Western states (including the U.S., the biggest contributor to the Environment Fund) reminded the GC that the worldwide recession had limited their ability to provide cash.

Acrimonious and prolonged debate also arose on a Swedish proposal to create a special fund to finance environment projects in developing countries, with an initial target of \$15 million. This was solidly opposed by the U.S., Britain, France, West Germany, Canada and other Western states who said it would not produce more cash and would mean just one more fund to administer. Sweden (strongly supported by Third World countries) said many aid funds could not now contribute to UNEP because they were only allowed to help developing countries, and the proposed new fund would tap this source.

The pressure forced Sweden to withdraw its proposal.

In the closing stages of the GC, the African countries put forward a resolution to condemn South African apartheid, calling for support for the victims of apartheid and requiring UNEP Executive Director Mostafa K. Tolba to present a report to next year's GC on the impact of apartheid on the environment.

In a heated debate, U.S. delegate Mary Elizabeth Hoinkes said the U.S.A. was saddened to see such a politically motivated resolution in this forum. And even Sweden and Switzerland refused to support the resolution. It was, however, passed by 17 votes to two—with 28 states abstaining.

Another resolution put forward by the Third World states called on governments to stop the arms race and to allocate .001 percent of their arms spending for development projects and for the protection of the environment.

UNEP completes its first decade next year, and a special session of the GC is being organized to mark the 10th anniversary of the Stockholm Conference which gave birth to UNEP. Dr. Tolba is appealing to world states to revive their dedication to the principles of preserving the environment. CHARLES HARRISON

International cooperation...

CLEANING UP OIL SPILLS, even accidental ones, should be the financial responsibility of the polluter, the OECD Council has recommended. The Organization for Economic Cooperation and Development (OECD), which is a consortium of the West's 24 most industrialized countries, recommended that the polluter pay for "reasonable remedial action taken by public authorities" to clean up an oil spill at sea.

In addition, the OECD calls on member countries to enter into mutual assistance agreements for the control of oil spills, so that financial terms of their operations are specified. This would be particularly useful in high-cost operations where the polluter would not be able to reimburse national authorities for the full cost of the clean-up.

TEST DATA ON CHEMICALS produced in any OECD country will be accepted as valid in all other countries of the 24-member Organization for Economic Cooperation and Development. The recent agreement by the OECD nations, who are major producers, traders and consumers of chemicals, came in a decision by the OECD Council. The Council also adopted two related recommendations: an international set of methods for testing chemicals, and an agreed set of principles to assure high quality results in testing chemicals.

One thousand new chemicals enter the market in OECD countries each year, adding to the 70,000 currently on the world market.

MOST EUROPEAN AND NORTH AMERICAN countries have taken major steps to reduce air pollution by sulphur dioxides, according to reports given at an Economic Commission for Europe seminar held recently in Salzburg, Austria.

The ECE prepared a special report noting that various legal, administrative and technical measures have been initiated by its member governments. It said that international cooperation had been strengthened, in particular, on the basis of the 1979 Convention on Long-range Transboundary Air Pollution.

Most countries have established ambient air quality standards or guidelines on sulphur dioxide or are in the process of doing so. Many have also imposed specific emission standards on particular enterprises or branches of industry.

Countries are also using alternatives to technological control of SO₂ emissions: energy conservation, energy other than fossil fuels, credits for control and charges for emission.

Toxics

THE THIRD DOLPHIN in three months was found dead in the Adriatic Sea, at the mouth of the Po River, killed by water pollution in the area, health authorities reported.

Laboratory checks proved that each kilogram of dolphin flesh contained 50 milligrams of mercury as well as traces of chrome and lead.

Ecologists claimed the death of dolphins and other fishes indicated that pollution of the Po was beyond the danger point and that the concentration of mercury, the result of industrial dumping into Italy's longest river, was well above a ceiling of 0.005 milligrams per liter fixed by national law.

A recent study by Milan University professors found that every year the Po dumps into the Adriatic 3,000 metric tons of detergents, 485 tons of lead, 65 tons of mercury and 64,000 tons of oil and hydrocarbon residuals. In addition five thermoelectric and two nuclear power plants discharge their hot waters into the river.

Giorgio Marchetti, of the university, claimed that Po pollution was responsible for a 33 percent loss of fauna in the Adriatic over the past few years, with pollution effects reaching as far as 400 kilometers from the mouth.

SWEDEN'S Chalmers Technical University in Gothenborg has set up a free "chemical service" on a trial basis to answer questions arising from the use of chemicals.

Professor Bengt Norden told the Stockholm newspaper Svenska Dagbladet he expected most questions to deal with environmental problems or the need for quick decision on risks involved in handling dangerous chemical preparations.

A number of so-called chemical waste "scandals"-when barrels of toxic substances have been found buried or sunken in waterwayshave alerted Swedes generally to the dangers of

chemicals.

THE CHEMICAL STUDY COMMITTEE of the UN Economic Commission for Europe (ECE) will meet in Finland Sept. 5-11, 1981, to consider two main topics: environmental problems in the oil refining and petrochemical industries, and the chemical industry in relation to other industrial branches, particularly forest industries.

Following the formal meetings there will be a study tour of large, modern chemical installations in the country. The tour is open to all interested persons who have been nominated or approved by their governments, or to members of international organizations participating in the work of the ECE.

Information on the meeting and tour is available from: Industry Division, UN Economic Commission for Europe, Palais des Nations, 1211

Geneva 10. Switzerland.

UNEP's toxic chemical register ready for use

NAIROBI-The International Register of Potentially Toxic Chemicals (IRPTC), part of the UN Environment Program's Earthwatch program, is now going into full operation-right on schedule.

IRPTC's Geneva-based director, Dr. Jan W. Huismans, interviewed at UNEP headquarters here, has been directing a massive operation to acquire, cross-check and collate scientific information on thousands of different chemicals. IRPTC has in its file information on more than 40,000 chemicals; and priority attention is being given to 300 to 400 (including around 160 agro-chemicals) which at present cause most concern because of their potential effects on health and the environment.

Formed in 1976, IRPTC already publishes and distributes regular bulletins (in English, French, Spanish and Russian) giving the latest information on chemical substances. China has now asked for the bulletins to be produced in Chinese for the benefit of its scientists.

And the office has just produced its first register, containing scientific details of 330 chemicals, with an indication of which data fields are covered by the IRPTC files. The index is computerized and will be updated at least twice a year.

More than half the world's countries, Dr. Huismans said, do not have effective legislative control on the use of pesticides. And there is growing concern about the supply to the developing countries of chemicals which have been banned elsewhere.

CHARLES HARRISON

Argentinian to head the **Environment Ligison Center**

NAIROBI—Gary Gallon, the Canadian conservationist (WER, Jan. 30, 1978, p. 5) who has headed the Environment Liaison Center (ELC) here for the last four years, leaves in June and will be replaced by Delmar Blasco, Gallon's deputy since 1978. The ELC coordinates non-governmental environment groups (NGOs) worldwide.

Gallon will return to Canada (he was Canada's Environmentalist of the Year in 1976) but is remaining here until August to help organize an NGO Forum on New and Renewable Sources of Energy at the time of the UN Conference, August 9-16.

Blasco, a 35-year-old Argentinian, is a schoolteacher and social anthropologist who worked with the International Voluntary Service and the International Youth and Student Movement in the UN. While with the ELC he has been responsible for strengthening liaison with Spanish-speaking NGOs.

Blasco's appointment was made by the ELC Board, whose 12 members include eight from developing countries.

From an initial membership of 45 organizations in 1974, the ELC now has 175 members, ranging from international bodies like the League of Red Cross Societies and the World Federation of Democratic Youth to smaller bodies such as the Environment

Protection Society of Malaysia. The ELC works with about 6,000 organizations altogether, including 2,500 in the Third World.

Gallon says the last eight years have been spent building the NGO network, monitoring the development of UNEP, pushing to create the UN Center for Human Settlements (HABITAT) and improving the ELC's capacity to assist developing country NGOs to strengthen their programs.

The ELC feeds NGOs with information on environmental programs; answers their queries; issues a regular newsletter, Ecoforum, in English, French and Spanish; organizes seminars and workshops; and participates in national and international conferences (such as the annual UNEP Governing Council in Nairobi and last year's World Food Council in Arusha, Tanzania).

CHARLES HARRISON

WHO has devised a method for rapid assessment of pollution

GENEVA—The World Health Organization (WHO) announced recently that it had developed a simple, new method for assessing air, water and land pollution sources.

WHO has been working for the past several years on developing and testing a relatively quick and applicable way to identify and assess environmental problems in a given city, region or even country. Their new method is called "rapid assessment."

It is based on available information such as industrial production figures, fuel usage, number of motor vehicles, population statistics and the like. When it is used alongside information such as local health statistics and regional development planning information, priorities can be set for environmental pollution control and prevention strategies.

WHO estimates that a rapid assessment study would normally take about six to eight weeks to complete for a city of two to four million inhabitants. The result could be an industrial waste profile that would show the most urgent control problems and those that may be emerging. Another application for WHO's rapid assessment might be for preparing environmental health impact statements of a proposed development project, either urban or industrial. And, on the national level, these studies could assist in determining the appropriate balance between economic development, health and environmental pollution control. WHO stated that this kind of rapid assessment would be of special interest to countries that have limited environmental control resources available since the method is an integrated approach and would reduce competition for scarce resources which might otherwise be spread over separate air, water and solid waste management programs.

The WHO guideline, "Rapid Assessment of Air, Water and Land Pollution Sources," will be published later this year. As a follow-up, the World Health Organization will ask help from other UN agencies in organizing a series of inter-regional workshops to train national environmental officials in the application of the rapid assessment technique.

WILLIAM G. MAHONEY

Environmental management...

"THE PRIME MINISTER, MRS. GANDHI, expects quick results," India's new secretary of the Department of Environment told WER. Dr. S.Z. Qasm, former head of the National Institute of Oceanography (which is working on bacteria that gobbles tar, WER Sept. 24, 1979, p. 6), says, "We have to do something fast—otherwise, everything will be over at the present rate of deterioration of the environment in the country."

One of Dr. Qasm's first projects is the launching of "eco-development" camps throughout the country for 25,000 youths during their summer holidays. "I want every child to look after a tree." Even at the panchayat, or local self-government level, he wants to spread the awareness of preserving forests.

"At present, any industry which has to be established requires a technical and economic feasibility report, but very soon, to qualify for a bank loan and other aid, a project will have to be cleared from the environmental angle."

The secretary, who took charge on May 15, agrees that the present penalties against polluters are too small and deserve to be tightened.

A MULTI-MILLION DOLLAR WILDLIFE protection and nature conservation project has been launched by Burma. The project involves setting up a number of national parks and nature reserves. The United Nations Development Program and the government of Burma are each contributing \$2.2 million to the three-year project.

IN WEST GERMANY, the city of Munich has begun a mapping project to determine where plants and animals live within the urban area so planners can prepare an overall recreational program.

The Bavarian Environmental Protection Ministry will provide 200,000 DM of the 400,000 DM (\$200,000) project, with the city picking up the rest

Studies show citizens spend from 60 to 70 percent of their leisure time in their own living areas. Every improvement in local recreational facilities helps stem the "flight from the city," Environment Protection Minister Alfred Dick maintained.

Munich is not the first Bavarian city to carry out such a study. Augsburg and Passau have already completed their biotope mapping. Fuerth and Neu-Ulm have similar studies in progress and Bamberg and Schweinfurt are scheduled to start in the near future. In all cases the Bavarian Environmental Protection Ministry has either provided or pledged funding.

Briefly ...

A NEW FELLOWSHIP PROGRAM for developing country environmentalists has been announced by the Natural Resources Defense Council. The fellowship, which provides all expenses for up to two months of study and practical experience in the U.S., is open this year to one applicant working on environmental or natural resource issues in an NGO, government agency or academic institution. Applicants should have a record of environmental accomplishment, the potential for utilizing the fellowship experience in his country, and fluency in English. A letter of application for the Stephen P. Duggan Fellowship should be sent no later than August 15 to the NRDC International Committee, Natural Resources Defense Council, 122 E. 42nd Street, New York, N.Y. 10168. It should list qualifications, discuss the applicant's objectives and give the names of two references.

THE WORLD WILDLIFE FUND has announced that, thanks to conservation efforts, the population of the once highly threatened vicuna of South America has increased sevenfold in the past decade, from 10,000 in 1970 to 77,000 in 1980.

The figures, provided by two internationally recognized scientists, appear to end a controversy that has raged among conservationists for the past year (WER, Sep. 22, 1980, p. 7). An aerial sample count conducted last April indicated a vicuna population in Peru's Pampa Galeras reserve of only 15,000. A Peruvian government plan to cull up to 2,500 vicina a year would have put the animal's survival in doubt.

The government asked WWF and the International Union for Conservation of Nature and Natural Resources (IUCN) to name independent observers to oversee a census that was carried out in September and October. The two-man team "completely vindicates" the original ground census method of the Peruvian project team in Pampa Galeras, the WWF said.

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The environmental movement's "grande dame" has died

LONDON—One of the environmental movement's most impressive champions, Dame Barbara Ward (Baroness Jackson of Lodsworth) died in May at her home in Sussex, England, at age 67. She was a past president of the International Institute for Environment and Development, an author, scholar, and friend and adviser of leading statesmen and politicians. Most of all, she was an advocate of a more equitable distribution of the world's resources to aid the development of poor nations.

Dame Barbara showed early promise of a brilliant career. After completing her formal education at Oxford, she was appointed assistant editor of one of Britain's leading weekly journals. The Economist, at the age of 25. During the Second World War she was recruited to the Ministry of Information and became well-known to millions of Britons through her broadcasts. The Times of London said in its obituary: "Miss Ward at once began to display the extraordinary range of intellectual and social qualities that will long be remembered by all who knew her; to beauty, personal kindness and modesty of demeanour she added elegance, assurance, gaiety, wit and a capacity for sizing up complicated topics and making them plain to the common man either in writing or by word of mouth."

At the end of the war Dame Barbara was appointed governor of the British Broadcasting Corporation (1946-50) and of Sadlers Wells and the Old Vic. She also became more closely associated with the Labour Party and developed her powers as a speaker.

Then came a period of intense academic activity including visiting lectureship in the U.S.A. at Harvard and Columbia Universities and prolific writing. Among the books she published at this time were "India and the West," "Rich Nations and Poor Nations" and "Nationalism and Ideology."

One of the most important and significant features of Dame Barbara's personality was her religion. She was a devout Roman Catholic and was inspired by her Christianity.

The emergence of environmental concern with the UN Conference on the Human Environment in Stockholm in 1972 was marked by the publication of one of Dame Barabara's most important publications, "Only One Earth; The Care and Maintenance of a Small Planet," which she co-authored with Professor Rene Dubos.

She was appointed president of the International Institute for Environment and Development in 1973, but was forced to step down last year due to ill health.

A close colleague of Dame Barbara during her years at IIED said she considered the period to be the culmination of her efforts. She made outstanding contributions in the fields of environment, population, habitat, food policy, water resources, the law of the sea, and science and technology. Her leadership in these areas, along with the publication of her last two books "The Home of Man" and "Progress for a Small Planet," did much to shape global awareness of the importance of these issues.

ALAN MASSAM



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Chemical-producing nations agree on common test rules

PARIS—The major chemical-producing nations have agreed to harmonize test data on new chemicals so their environmental effects can be known before they are put on the international market.

Douglas Costle, Administrator of the U.S. Environmental Protection Agency, called it an "international breakthrough" in the regulation of chemical substances.

"This is the first time an international consensus has been achieved on the proposition that new chemicals must be tested for health and environmental effects before going on the market," Costle said.

The purpose of the three-day Organization of Economic Cooperation and Development meeting, held here in May, was to give political momentum to a three-year campaign for international controls on chemicals.



Chemicals, the OECD reported, play a central role in the economies of its 24 member states—the Western nations and Japan. Sales are now running at \$300 billion a year, and of the four million known chemicals, about 70,000 are marketed worldwide.

The OECD nations agreed to a minimum set of guidelines for pre-market testing and also to general principles of good laboratory practice for the testing—both are to be continually updated.

There is more to be done. The OECD is still working on developing solutions to the problems of confidentiality. Said Costle, "On the one hand, we need access to health and safety data. On the other hand, the proprietary value of certain information must be protected. All nations agree that this is a major challenge for future deliberations."

Other challenges are to develop an international glossary of key terms so as to avoid non-tariff barriers to trade, information exchange procedures, and further studies on the economic and trade aspects of regulating chemicals.

The idea is to minimize the impact of new chemical control laws on international trade and member states' economies.

Water wise...

A NEW SURVEY OF THE RED SEA waters from Aqaba to Jizan has been commissioned by the Saudi Port Authority. The survey will chart the coastal waters and provide fresh information on the underwater characteristics of the Red Sea. They hope to find and record, among other things, coral reefs that have not been charted before but that could pose a serious threat to the supertankers plying the Red Sea waters. Charts currently used for the offshore Jeddah area are largely based on data no more recent than 1912.

The need for accurate charts becomes even more acute as Saudi Arabia presses ahead with its development. When the huge petrochemical scheme at Yanbu is finally operational, the increase in oil tanker traffic in the Red Sea will be significant. The new charts will go a long way towards preventing oil spills that could greatly damage marine life in the Red Sea.

A BAMBOO WATER PIPE project is carrying water to 50,000 people in eight villages in the Mbeya, Iringa, Bukwa and Ruvuma regions of southern Tanzania, according to a recent report in the government-owned newspaper The Daily News. Another 18 villages will be supplied with water carried through bamboo pipes over the next year. Research has shown that bamboo pipes, which are produced in Tanzania, are as durable as plastic pipes and can last for 15 to 20 years.

THE WORLD BANK is expected to loan Pakistan \$60 million to maintain and improve its canal system, surface drainage, flood protection bunds and farm water management in all provinces.

CHINA'S JIANGXIA TIDAL POWER station has started to operate. The station, situated in Yueqing Bay, Zhejiang Province, is the country's biggest tidal power station. When completed, it will have a total of six generators, each with a capacity of 500 kilowatts and a turbine for two-way operation.

AUSTRALIA will establish a \$25 million marine science complex in Tasmania.

The decision comes in the wake of the declaration of Australia's 200-nautical-mile (320 kilometer) fishing zone and an inquiry into the Commonwealth Scientific and Industrial Research Organization, which has resulted in the enhancement of that organization's oceanographic responsibilities.

About 170 CSIRO employees are moving to the new center in Hobart, which also includes a new research vessel and a \$9 million research center. The complex will be operational in five to seven years.

Noise controls

Another OECD meeting, held earlier in the month, led to the first coordinated crackdown on noise pollution in the 24 member states. Nearly all of the 200 participants agreed that the main cause of noise pollution is motor vehicles—"20 times more people are annoyed by automobile noise than by aircraft noise," said Jim MacNeill, head of the OECD's environmental directorate.

Member governments at the meeting unanimously recommended that the decibel level of cars operating within their nations be reduced by an average of 5, while truck, bus and motorcycle noise should be reduced by an average of 10 decibels—sometime between 1985 and 1990. It won't be cheap. It is estimated that there will be a percentage point rise in cost to consumers for each decibel lost.

The U.S. delegation suggested harmonizing noise-measurement procedures and standards. "Trade is obviously a great concern in this matter and the more harmony we have, the fewer are the obstacles to exporting and importing," said an OECD official.

Other sources of noise should also be integrated into these new abatement policies, MacNeill said, such as from airplanes, railways construction sites, even domestic appliances.

AIDA ATTALLAH



The new Mediterranean treaty turns the tide of pollution

ATHENS—Representatives of 11 Mediterranean countries have signed a treaty to reduce and control the major pollutants that flow from their lands to the sea.

The significance of the treaty is that it is the first to deal directly with pollution originating on land—factory wastes, municipal sewage, and agricultural pesticides and fertilizers—which constitute about 85 percent of all pollutants entering the Mediterranean Sea (see WER, Nov. 19, 1979, p.2).

The treaty signing came at the end of a six-day meeting (May 12-17) here. It was organized by the United Nations Environment Program (UNEP) at the invitation of the Greek government.

The 11 (of 18) Mediterranean coastal states who signed the treaty are: Spain, Italy, France, Greece, Monaco, Tunisia, Libya, Malta, Morocco, Cyprus and Lebanon. Turkey, Algeria, Yugoslavia and Israel were present and approved the treaty, but will sign it later. The European Economic Community also signed. Albania, Syria and Egypt did not participate in the meeting.

"This is a major step, an indispensable step towards stopping the degradation of our common sea," declared Marinos Yeroulanos, a leading Greek government environmentalist, adding: "The agreement demonstrates that political differences can be overcome by an awareness of a common problem and a determination to do something about it."

Three years of difficult and delicate negotiations produced the treaty that will cost Mediterranean governments \$10 to \$15 billion over a period of 10 to 15 years.

Two kinds of substances are dealt with in the technical annexes. The first belong to a so-called black list, which because of their toxicity are prohibited from entering the Mediterranean even in minute amounts. The grey list consists of less noxious substances. Because they are more readily rendered harmless by natural processes, limited polluting discharges into the Mediterranean are allowed.

The treaty is comprehensive because it takes into account all possible pathways of pollution: pipelines, outfalls, chimney stacks and rivers.

In granting licenses for the discharge of grey-list pollutants, national authorities are to be guided by the characteristics and composition of the waste, the nature of the discharge site and the "receiving" marine environment, the availability of waste-control technology, and the potential impairment of marine ecosystems and sea-water uses.

The waters used for swimming or shellfish growing will have to be of the same quality all around the Mediterranean. This means that treatment of sewage will have to be stricter where the amount of sewage is high.

In the two or three years it will take to ratify the Athens treaty, uniform Mediterranean standards for the quality of seafood will be set. And laws will be adapted to conform to the text of the treaty.

At regular meetings every two years, states will report on measures taken, authorizations granted, the level of pollution in their waters and the quantities of pollutants discharged from their territories. Countries which do not live up to the terms of the treaty will have to face embarrassing criticism from other governments.

What does all this mean for the more than 100 million tourists who vacation each year in the Mediterranean? Does it mean clean beaches and unpolluted waters for the tens of millions of people who live on or near its shore?

"Eventually yes, immediately no," said Stjepan Keckes, the Yugoslav marine scientist who runs UNEP's Regional Seas Program. "Mediterranean beaches and coastal waters were not polluted just in a day or a year, so it is not realistic or reasonable to expect them to be cleaned up overnight. Nevertheless, I can honestly say that the signing of the treaty in Athens will mark a turning point in the rising tide of pollution. By the end of this decade I believe that we will have reversed the trend of pollution and be in a position to limit and control it."

KYRIACOS CONDOULIS

In Europe...

SIX NORWEGIAN ORGANIZATIONS, representing farmers, landowners, freshwater fishermen and conservationists as well as the World Wildlife Fund, claim the Norwegian salmon is in danger of extermination because of the widespread practice of drift-net fishing in the high seas.

The organizations have put forward a number of demands to the authorities—demands that undoubtedly will conflict with the interests of deep-sea fishermen.

One is that drift-net fishing must be reduced to the 1971 level of 250 tons. Last year 1,000 tons of salmon were caught by drift-nets—a sharp increase from 421 tons in 1978—despite the fact that the drift-net fleet was reduced by 50 percent. Among other demands is the prohibition of mono-filament and multi-filament twine in drift-nets and salmon traps.

Big salmon almost completely failed to appear in western Norwegian rivers last year; smaller salmon were able to get through the drift-nets but were often badly harmed.

NEW ENERGY TECHNOLOGIES will be the subject of an international seminar sponsored by the Economic Commission for Europe's senior advisers on science and technology. It will be held at the Juelich Nuclear Research Establishment in West Germany December 8-12, 1980.

Its purpose is to provide a forum to exchange national experience on new energy sources—in particular solar, wind and geothermal—as well as on problems associated with the integration of these sources into existing power systems.

IRELAND is getting IR£10 million (\$20.6 million) from the European Economic Community to boost its development of peat bogs for fuel production.

Through its state company, Bord na Mona, Ireland has already done considerable work in this regard but the loan—repayable over 15 years—will enable the program to be expanded considerably.

Some £6 million (\$12.36 million) will go towards developing 2,833 hectares of bogland and to build a factory at Littleton in County Tipperary, where the peat will be processed into briquettes.

Just under £4 million (\$8.24 million) will go towards development of bogs in five areas, mainly in the Midlands, which will produce milled peat for peat-fired power stations and also for the manufacture of briquettes.

At present Ireland gets 20 percent of its electricity needs from peat, and production by Bord na Mona currently equals one million tons of oil imports.

More on Europe

IRELAND NEEDS TO REDUCE its dependence on imported oil more quickly than the rest of the European Economic Community, Current energy predictions show that by 1990, EEC oil dependence will be down to about 45 percent, but Ireland will still be needing oil for 60 percent of its energy needs.

Common Market Director-General for Energy, Leonard Williams, told a national seminar on energy organized by the Irish Congress of Trade Unions in Dublin that Ireland was above the EEC average of 55 percent at present, with a

figure of about 70 percent.

TO ACHIEVE AN ANNUAL 10 PERCENT SAV-INGS in energy costs, the Irish government is considering training teams of advisors to call on homes nationwide, and industries and transport companies, to point out ways to conserve

Energy Minister George Colley told State and private industrial leaders that energy conservation must be achieved and reckoned each household could save £100 (\$212) a year by more

efficient usage. He also declared that there would be no nuclear power inquiry in Ireland this year. He said he was awaiting results of investigations into American nuclear power station accidents which would be examined by an inter-departmental committee.

There appears to be some weakening of support in Government circles for immediate progress on the proposal to build Ireland's first nuclear power station at Carnsore Point in County Wexford.

IN REGGIO EMILIA, ITALY, an experimental plant produced 400 cubic meters of biogas a day from a 1,000-swine farm. The biogas was used for heating.

The provincial authority of Forli, in agreement with the local breeders association, will build similar biogas plants in area hog farms by

Fiat of Turin, the giant Italian auto maker long testing sources of alternative energy, has produced a generator, called Totem, powered by biogas produced through treatment of animal wastes. Totem, exploiting a 903 cubic centimeter engine of the 127 auto model and powered by natural gas, biogas or other alternative energy sources, can be used for producing heating and electric power in agriculture, industry and private homes. It can also be used for water purification and desalination.



An action association is formed to save Lake Geneva

GENEVA—An association to fight the growing pollution of Lake Geneva has just been established, bringing together French and Swiss biologists, ecologists, fishing and environmental groups.

Three Geneva environmental groups—Arcadie, Group 2002 and the Institut de la Vie-provided the initial impetus, contacting the experts and bringing them together.

A spokesman, Jean-Bernard Lachavanne of the University of Geneva, noted that in less than 30 years the lake has degraded to the point where it is entering the final stages of eutrophication.

Working groups have been set up to develop an action program for effective solutions. "It amounts to stopping the talking and starting acting," Lachavanne said.

Eutrophication is caused by phosphates and nitrates coming both from agriculture and waste water (detergents above all). This leads to a proliferation of algae and other plant life and causes a decrease in oxygen in the deeper levels and an increase on the surface. Experts say the huge lake could survive a load of up to 320 tons of phosphates a year without serious damage. However, at the present rate about 1,500 tons enter the lake annually.

The new Association pour la Sauvegarde de Leman (ASL) or in English, the Association to Protect Lake Geneva, has called for an immediate first step: installing a chemical cycle in the sewage purification stations around the lake to extract phosphates.

But, they added, it would be preferable to strike at the real source: banning the use of detergents carrying heavy loads of phosphates and nitrates while at the same time educating farmers on the most economic manner to spread fertilizers in their fields.

Fishing groups—both French and Swiss—have long protested because their commercial catches of perch, lake trout and pike have fallen off sharply. WILLIAM G. MAHONEY

Sweden bans spraying forests with chemicals for a year

STOCKHOLM—Sweden's parliament has approved a stop on chemical spraying of forests either from the air or on the ground for a period of at least one year from June 1.

Although farmers use far more chemicals to keep down weeds and pests, they are exempt from the law as long as they stick to approved types of sprays.

The virtually unanimous decision was taken May 21 after heavy and continuing pressure from environmental groups. The ban was made temporary with an option of extending it until a parliamentary committee appointed last Autumn can come up with a long-term solution to the problem. The committee's task is to report on the effects a total permanent ban of toxic sprays would have on employment, the economy and the environment.

Environmental protests against spraying have been commonplace during recent summers. Activists have camped for weeks in areas slated for spraying and frustrated forest owners' plans. Others have blocked air strips from which the planes were to take off. They claim spraying entails dangerous risks to health and poisons the environment, particularly the streams and the wild berries which the Swedes love to eat.

As a result of the ban, forest owners will have to try clearing the underbrush mechanically or by hand, but they were pessimistic about managing more than a fraction of the acreage originally slated for spraying this coming season. The Board of Forestry has estimated that to clear 30,000 hectares in this fashion, apart from the difficulty of finding hands to do that type of work, would cost approximately 50 million crowns (\$12 million) more than spraying.

In the long run, according to forestry officials, a ban would stunt the growth of fir and pine trees and result in a loss of forest production. SPECIAL TO WER

The distillery project, which up to now has not been named, is hedgical for completion in 1982. GEORGE HAWRYIYSHYN.

The threat of acid rain may be exaggerated, says one study

GENEVA—The May Bulletin of the International Civil Defense Organization (ICDO) has warned that while "acid rain" does constitute an environmental danger, the threat should not be exaggerated.

"It's certain that acid rain seriously affects some forms of aquatic life. On the other hand, some ecosystems appear to benefit from acid rain while others may not be affected at all," the article stated.

The solutions envisaged are costly, it said, such as the installation of pollution control devices on industrial and utility boilers, and the insistence that industries burn expensive low-sulphur oil. The new, more severe mandatory controls on automobile engines will also raise costs, it noted:

"Ironically, the problem may have been aggravated by the big environmental push about 15 years ago to substantially reduce the amount of particulate emissions from oil and coal-fired boilers," the article commented. "These emissions are generally alkaline and offset the tendency of other emissions from the same smokestacks to form acids in the atmosphere. As one expert commented, in trying to correct one problem at a time, we cause another."

years and in the United States for 10 years, but that it became a really hot topic only recently when the U.S. Environmental Protection Agency decided to investigate. WILLIAM G. MAHONEY

In Latin America. . soixol

IN THE LATEST DEVELOPMENT on the Agent Orange issue (WER, May 5, p. 8), a claim that I I more than 600 Australian veterans were affected by the defoliant during the Vietnam war has been filed in the Federal District Court in New York.

About 200 of the ex-servicemen are also participating in a joint American-Australian claim involving 600 American veterans against six companies that made the chemical. Claims of illness and deformities in offspring have been made. More than 40,000 Australian servicemen were sent to Vietnam in the late 1960s.

The Australian claim, filed late in April by of Brisbane Lawyer William McMillan, names eight chemical companies as defendant: Dow Chemical, Monsanto, Hercules, Thompson-Hayward, Diamond-Shamrock, William T. Thompson, Inc., Hoffman-Taft and Univoyal.

HARD ON THE HEELS of the Agent Orange outcry in Australia comes the Maralinga atomic testing cancer controversy. Maralinga, in a remote part of South Australia, was the site of British atomic testing in the 1950s and 1960s.

At least 40 cases of cancer deaths among exservicemen, civilians and police who worked at the testing site have been reported, and an inquiry into the health of ex-Maralinga workers was ensue.

An organization launched in Queensland to adjusted information, the Atomic Veterans' Association, has called for a full government inquiry into the affair.

AN ITALIAN RESEARCH FIRM has developed a patented process for recycling toxic waste in resulting from painting automobiles, refrigerators and home appliances.

In Italy, 20,000 metric tons of wastes produced by the auto and home appliance industry are usually buried while in other countries they are incinerated—both solutions costly and danger-ous to environment.

The Livio Rossi firm of Frossasco (Via Campagnola, 4, province of Turin) makes panels from the recycled wastes. The toxic wastes, including resins and metals such as chromium, titanium, iron and manganese, are mechanically pressed and the medley is then mixed with a range of fibers—synthetic, vegetable, glass and asbestos. The panels are put in a die and taken to a temperature of 160 degrees Centigrade. The panels produced, in inert material, can be used for furniture and car doors and can replace various materials such as plywood, masonite and cardboard.

Fiat of Turin, Italy's largest auto maker, is known to be interested in the process.

In Latin America ...

THE CHILEAN NUCLEAR ENERGY commission has announced that the country will not go ahead with plans to develop a nuclear generating plant at least until the year 1985 for "economic reasons." The decision is to be restudied in 1985, at which time, says the commission, a final decision will be made.

Rudolf Rihm, director of development for the national electricity company Endesa, says that to build a nuclear plant in Chile would be "extremely expensive, totally out of focus," even though feasibility studies have already been carried out by several foreign firms.

IN COLOMBIA, there has been one murder, one manhandling, and property destroyed as homesteaders and lumber companies try to cut down the last surviving primitive Andean forest in the southwest.

The forest forms part of Meremberg, a 70-hectare sanctuary created over a decade ago by German conservationist Gunther Buch and his wife Matilda. Meremberg has provided an exceptional research site for Colombian and foreign natural scientists, and last year Buch was named "Conservationist of the Year."

In 1977 Mrs. Buch was murdered by colonists, who have destroyed most of the forest up to the perimeter of the sanctuary. The attackers also threatened to kill the estate manager, whom they manhandled. Conservationists fear that if the government does not intervene, Buch may suffer the same fate as his wife. His cabin has already been destroyed.

THE VICUNA POPULATION in Peru may not be as large as estimated. An independent aerial survey indicated there may be only 15,000 vicuna in the Pampa Galeras reserve, whereas the population was believed to have increased to 43,000 last year—from a low of less than 1,000 in 1968. Because of this dramatic rise in numbers, a culling program was begun in 1979 and was to continue through this year. This would honor an agreement the Peruvian government made with people in the area that as soon as vicuna increased to a certain level, some could be harvested for meat and wool. But because of the disparity in figures, the World Wildlife Fund has called for a review of the vicuna census.

This luxury wool-bearer is also making a comeback in northern Chile. There are now 7,300 while in 1973 only 1,000 had survived, said Chile's national forestry corporation, CONAF. Chile will send some vicuna to Ecuador, where they have become extinct.

Vicuna are found in Bolivia and Argentina as well.

World's biggest alco-fuel distillery to be in Brazil

RIO DE JANEIRO—The world's biggest alcohol distillery—for car fuel—is being built in Brazil. With a planned capacity of 1.5 million liters a day, the distillery could run 110,000 vehicles.

Project backers (a group of Brazilian businessmen) plan to invest about \$70 million to plant sugarcane and build a distillery to process 25,000 tons of cane a day, making it the largest project of its type in the world, according to the owners. It will be located in Mato Grosso do Sul, where the group has purchased a farm of 250,000 hectares.

The investors are the Votorantim Group, Ometto, and Dedini, some of the largest producers of cement, sugarcane, alcohol and sugar mill equipment in the country, as well as Atlantica BoaVista which is one of the country's largest insurance groups.

The location of the distillery is exceptionally far from consuming centers: 2,000 kilometers from Rio de Janiero, 1,000 kilometers from Sao Paulo, and 400 kilometers from Campo Grande, the capital of Mato Grosso do Sul, which has given rise to much speculation by Brazilian newspapers. This mystery may perhaps be explained by hints that there is a plan to construct a petrochemical plant using sugarcane alcohol in the area.

The distillery project, which up to now has not been named, is scheduled for completion in 1982. GEORGE HAWRYLYSHYN

Gasohol gets a go-ahead in the Philippines

MANILA—The Philippine government has created an Alcohol Commission to speed up the production of alcogas (gasohol).

President Ferdinand Marcos appointed Hermenigildo Zayco executive director of the commission which is to oversee the mass production of alcohol from sugar, cassava and sorghum. The giant sweet potato from Japan may also be commercially cultivated.

The presidential plan also calls for close cooperation among a number of government ministries.

- The Philippine Sugar Commission will supervise the establishment of distilleries and ensure an adequate supply of sugar cane.
- The Energy Ministry, through the government-run Philippine National Oil Company, will be the exclusive buyer of the alcohol and the sole distributor.
- The Agriculture Ministry will study the technical requirements for the mass production of such crops as cassava, corn and sorghum. And,
- The Industry Ministry will promote the manufacture of car and truck engines that can use alcogas.

There is a major problem: So far no foreign firm has shown any interest in investing in the alcogas program. The only interest they have shown is in supplying the Philippines with alcohol manufacturing equipment.

Most of the alcogas "know-how" the Philippines has sought comes from Brazil. Government investigative teams, including the Energy Minister himself, have scrutinized Brazil's sophisticated alcogas program which they say is the best model for Philippine requirements.

The Alcohol Commission is now reviewing a package of incentives—including minimum taxation and simplified investment regulations—to entice firms to enter into alcohol production. One key factor still to be resolved is where the plantations for alcohol production will be located.

Nevertheless, the government has adopted an ambitious 10year scheme whereby it hopes alcogas will reduce gasoline consumption by 15-20 percent. KEITH DALTON

Pakistan is reclaiming oil in its first home-built plant

ISLAMABAD—Pakistan's first locally built oil reclamation plant has gone into production at Kot Lakhpat, Lahore, 290 kilometers southeast of here.

The plant will save the country \$2.2 million in foreign exchange a year by producing 7,000 tons of lubricant oil. The saving, though small, shows the concern of this nation which is spending \$1.2 billion on oil imports. That is half its total foreign exchange earnings from visible exports.

In the U.S., Congress was asked by the Association of Petroleum Re-refiners (APR) to pass legislation which would boost the recycling of used oil and "bring this country closer to the goal of energy independence."

APR's President, Kimball Morris, said the re-refining industry is now composed of less than 10 companies producing less than 378 million liters of quality reclaimed lubricating oils as compared to 1960 when more than 150 companies produced more than 1,135 million liters, accounting for almost 18 percent of the nation's total consumption.

"If this industry grows," he said, "the country will reap the benefits of a cleaner environment and the continued re-use of an already scarce source."

The Pakistan reclamation plant was completely designed and manufactured without foreign assistance. The entire project cost \$240,000 with no foreign exchange component. The recovery rate for used oil is nearly 70 percent.

At present about 30,000 tons of used oil are available for reclamation, the major sources being the railways and thermal power stations. Two more units—each reprocessing about 7,500 tons a year—should be set up by September.

The Pakistan National Refinery produces 80,000 to 84,000 tons of lubricant oil annually, while the country's requirement is about 120,000 tons a year. The deficit of about 40,000 tons is met through imports.

The Pakistan State Oil reclamation plant is not only aimed at saving foreign exchange but also at conserving energy, and it has boosted local technology.

MOHAMMAD AFTAB

Energy Sources...

NUCLEAR POWER is essential for the solution of China's energy problems, according to 350 of the country's leading nuclear scientists. In a statement issued following the first National Conference of the Chinese Nuclear Society in Beijing, the scientists called for large-scale production of nuclear power plants. The scientists also called for more emphasis on the development of nuclear technology and isotope research.

Even though China was the fourth nation in the world to join the nuclear club in so far as military weaponry is concerned, it still does not have a single nuclear power plant.

A SOLAR-POWERED PLEASURE boat recently began service on the West Lake in Hangzhou, capital of Zhejiang Province, South China. The boat, which is powered only by solar energy, creates no noise or pollution. The body of the craft is made of fiber glass. It is 5.2 meters long and 1.3 meters wide and can hold five or six persons. The ceiling of the boat is made up of 3,168 small monocrystalline silicon cells which collect energy from the sun and put out 120 watts. On a fine day the boat will collect enough power to drive its electric motor for three hours. The boat's speed is about 6 kilometers per hour. The boat was designed and built by the Ningbo Semi-Conductor Apparatus Plant and two small shipyards in Yinxian county.

THE GROWING THREAT of an energy crisis, caused by drought affecting hydro-electric power production plus spiralling oil prices, has forced the government of Thailand to implement curbs on energy use.

Starting April 15, all television stations, nightclubs and discos, supermarkets and department stores, and factories using machinery consuming more than 500 kilowatts of power have had to cut down on their operations.

On the first day of the restrictions, total nationwide consumption dropped from the average peak demand of 2,350 megawatts to slightly less than 1,700 megawatts.

Meanwhile, the government is considering further conservation measures, including higher taxes on some electrical appliances, an extension of the Sunday closure of gasoline stations to Bangkok's neighboring provinces, more flexible working hours for government offices and agencies, and changing the school summer vacation from March-May to during the rainy season (sometime in June-September).

The government has also announced that violators of the April 15 energy control measures will face fines of up to \$5,000 and/or 10 years in jail.

In AsiasourcespisA nl

THE SOUTH KOREA DEVELOPMENT INSTITUTE (KDI) has organized a panel to form a consensus on environmental protection. The panelists consist of 11 academics, two journalists, three senior research officials, and a representative each from the industrial sector and the general public. The majority of the participants agreed with the setting up of an anti-pollution fund to finance environmental improvement. However, disagreement has arisen on ways of attaining the substantial amount of two trillion won (\$3.4 billion)—almost one fourth of this year's national budget—needed to improve the country's national environment.

suggestions from a group of environmental experts for tougher and more specific environment laws in China—including the imposing of fines on factories that pollute the air and water—are to be presented to the State Council (Cabinet). The environmentalists recently attended a conference sponsored by the Chinese Society of Environmental Sciences, the Chinese Society of Economic Technology and the Chinese Society of Modern Management.

BEIJING'S STANDING COMMITTEE has decided not to expand heavy industry in the capital of China. This decision came from a recent meeting to study and discuss a four-point proposal by the Party Secretariat for the beautification and modernization of Beijing.

HONG KONG WILDLIFE conservationists recently urged the government to crack down on the import of ivory, believed to originate in Kenya and the eastern part of the Indian subcontinent. Although Hong Kong enforces the ban on the import of Asian and Kenyan ivory, traders usually circumvent the control by importing through countries like Belgium, France, Saudi Arabia, the Central African Republic and Zaire, an official said. According to official statistics, the total value of imports of unworked ivory in October, 1979, was \$2.5 million.

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Sri Lanka's gas conservation plan has serious side effects

COLOMBO—Sri Lanka's fuel conservation effort has proved successful in substantially cutting back gasoline consumption in the country. But in its wake have come new problems—a build-up of petroleum stocks at the country's only refinery and a sharp increase in diesel use.

The state-owned Ceylon Petroleum Corporation (CPC), Sri Lanka's monopoly petroleum importer, refiner and distributor, has told the government that gasoline stocks are building up at the rate of 76 tons per day and that the refinery is rapidly running out of storage capacity. Export at cost is not possible as lack of storage permits only the offer of small parcels that fetch uneconomic prices in the international markets.

Since start-up in the late sixties, the refinery maximized production of middle distillates—such as kerosene and diesel—which require the annual production of a minimum 120,000 metric tons of gasoline.

This production has to be kept moving and the gasoline either consumed internally or exported, otherwise the whole refining process will come to a standstill with storage tanks filling up. This is what is happening in Sri Lanka where heavily jacked-up gasoline prices and the Sunday motoring restrictions which prohibit private cars on the road between 8 a.m. and 2 p.m. have dramatically reduced gasoline consumption.

In 1978, an imperial gallon of gasoline retailed at 83 cents (U.S.), and annual consumption was 129,985 metric tons. At the current price of \$2.34 a gallon, coupled with the Sunday restrictions, the annual demand is down to 100,000 metric tons against the minimum 120,000 metric tons that must be kept moving.

These economies have been effected despite the dramatic increase of vehicles, particularly motorcycles, on Sri Lanka roads during the last two years.

On the other side of the coin, the demand for auto diesel has increased substantially. Diesel price increases have been kept low as both the country's public transport system and haulage fleet is largely diesel fuelled. Additional quantities of diesel fuel will be needed this year to meet the needs of new gas turbines now being installed, the Mahaweli River diversion project and industrial and bunker use.

The government-appointed fuel conservation committee has pointed out that the government has been making huge profits on gasoline sales with the retail price now over twice production cost. But both diesel and kerosene were being subsidized. It has strongly recommended the immediate price increase of diesel above production cost but the government, conscious of what it will do to public transport fares and consumer essentials, is dragging its feet on the question.

The committee has come to the irrefutable conclusion that for fuel conservation to be successful, there should be a reduction in the entire spectrum of crude oil-derived products so that crude imports could be reduced.

MANIK DE SILVA

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South Africa should need no imported oil by the year 2000, says the nation's Energy Research Institute 6

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Six south Asian countries agree to form a cooperative environment program 8

Romania launches a major tree planting & conservation plan

BUCHAREST—Some 2000 years ago, one could walk from the Carpathian Alps south to the Danube River through thick forests. Then, ancient historians said, the traveler could hardly see the sky. Today, the landscape along those 200 kilometers has almost completely changed. Due to massive deforestation and the opening up of new lands for human settlements, agriculture and industry, the once-thick forests are just scattered clusters of trees.

Concerned about the loss of its "green gold," which once covered more than three-quarters of the country's territory, the Romanian government has launched a long-term program for the conservation and development of its declining forest stock. The program goes through the year 2010.

The state-sponsored program sharply reduces the volume of forest cutting to 20 million cubic meters of timber a year. It mandates reforestation of 250,000 hectares annually until 1985 and also envisages improving 700,000 hectares of "less productive" forests.

Forests currently cover some 6.3 million hectares or some 27 percent of Romania's total area.

Specialists warned that Romanian industrial emissions are damaging some 56,000 hectares of wood. In the near future as industry expands, the forest area being "bombed" by industrial gases, residues and particles will be four times as much unless "drastic and efficient measures" are taken immediately.

Planners, meanwhile, have drawn up a "functional zoning" of forests dividing them into two classes by the role they play in the country's economic life. The first group includes forests serving environmental protection purposes and those having socioesthetic functions like recreational zones near cities, or of scientific importance like national parks and preserves. The second group covers forests serving production purposes, from which timber is obtained for industrial processing.

By careful exploitation of mature wood—oak trees will be left to grow more than 100 years—it is hoped that stepped-up amounts of large-tree wood will be supplied to the national economy. Romania is an important manufacturer and exporter of furniture.

It is estimated that after the year 2010 the increased forest stock will ensure the exploitation of 32-35 million cubic meters of wood annually. The program also establishes measures to improve the education of cadres and urges citizens from 6 to 70 to plant "at least" a tree each year.

SPECIAL TO WER

Forestry ...

MALAWI, in south-central Africa, is starting an

energy forests program.

This \$16.3 million project (\$13.8 million comes from the World Bank) will establish a national network of 88 tree nurseries. Seedlings from them will be sold to smallholders, who will be encouraged to establish their own woodlots. In addition, a number of fuelwood and pole plantations will be started to meet the increasing demand.

The Forestry Department's Wood Energy Division will be strengthened, trials for expanding charcoal production will be carried out, and there will be studies on alternative sources of

energy.

The World Bank believes that eventually 9,500 farmers will be able to provide for their households' wood needs, thus lessening the burden on women who are the primary fuel-wood collectors.

THE CHINESE MINISTRY OF FORESTRY announced that China has air-seeded 66,660 hectares during this year's nationwide afforestation drive. Through air-seeding techniques, China by the end of 1979 had grown more than 11 million hectares of forests in 460 counties, spreading over 22 provinces, autonomous regions and municipalities.

The survival rate of the air-sown seeds is about 40 percent.

THE SRI LANKA GOVERNMENT has framed regulations requiring the mandatory imprisonment of persons found guilty of causing forest fires. In place of the earlier law, which prescribed a fine of up to Rs.1,000 (about \$62) or a term of up to one-year's imprisonment, the new regulation requires a jail sentence of up to five years.

A crippling drought which gripped the country's mountainous central areas earlier this year resulted in a number of grass and forest fires prompting the government to tighten protective laws. President Junius Jayewardene, Sri Lanka's environment-conscious chief executive and Defense Minister, has authorized the use of the police and the military to fight forest fires.

THE THAI Agriculture and Cooperatives Ministry recently announced plans to increase the number of forest units in the country from the existing 220 units to 350 by 1981. The Ministry is now seeking a \$4.92 million budget from the government to set up 20 additional forest protection units within this year, a spokesman said.

Sweden plants energy forests to help cut oil consumption

STOCKHOLM—The government here has announced its financial support for the first full-scale Swedish experiment in cultivating energy forests as an alternative to oil.

"Now we are moving from words to action regarding energy forests," Minister of Industry Nils G. Aasling said. "Research has advanced so far that now is the time to invest in a complete full-scale trial."

The Board for Research into Energy Production (NE), which has been studying the possibilities for some time, received government approval to put approximately 10 million crowns (\$2,353,000) into the project.

The Southern Forest Owners Association is to cultivate 100 hectares of land lying fallow in the province of Kronberg. The land is said to be of little interest for agricultural purposes. Another 8 hectares of bog in central Sweden is to be developed by the Crown Lands office.

The forests, planted very tightly with cuttings of fast-growing species of willow, poplar and alder, are to be harvested every two to three years and then renew themselves. The product could be used as a solid fuel for burning in thermal power stations or for the production of methanol fuel.

A highly mechanized system of cutting the forests also was developed for testing, a necessity in order to judge the economic cost of the forests as a raw material for power and consequently their feasibility as a replacement for oil.

SPECIAL TO WER

Acid "fallout" is poisoning Czech forests and waterways

PRAGUE—The situation of the forests in northwest Czechoslavakia is extremely serious. But it is not hopeless if no further power stations are built there, if extensive land-improvement work is undertaken, and if the forests are changed from coniferous to deciduous, Czechoslovak environmentalists say.

The forests first suffered environmental damage between the two World Wars. The proximity to the Sokolov coal basin around which several mammoth solid-fuel power stations were built almost sealed their fate. By the end of 1978 foresters found 41 percent of woodlands in the Ore Mountains and the Slavkov forest had been damaged: 36,000 hectares of land, with 1,000 contiguous hectares entirely dead. The damage continues to grow each year, with the most serious situation developing in forests hit by sulphur dioxide emissions from power stations.

The situation in the Ore mountains is especially serious because these serve as a natural reservoir of surface waters. Acid rain also falls on mineral springs of the world-famous spas, Carlsbad and Marienbad, which originate in the Slavkov Forest. Some pollution also comes from West and East Germany.

Long-term organizational steps have already been taken to provide the area with a sufficient number of seedlings and seeds, and the enterprises responsible for the damage have been appealed to for help which by law they are obliged to provide. Some have already taken steps to help the foresters. A Skoda plant, for instance, is assisting with the repair and maintenance of the necessary forest machinery.

IVA DRAPALOVA



Greece saves the Acropolis from air-borne destruction

ATHENS—The Greek government has announced a series of drastic measures to protect the 2,500-year-old monuments on the Acropolis hill. They are being destroyed by air pollution.

Buses and tourist coaches are banned from the area and being replaced by trolley buses. A nearby gas factory will be relocated. And trucks are prohibited from parking near the hill. In addition, high-sulphur oil used for heating the apartments that surround the Acropolis will be replaced, first by low-sulphur oil and later by gas. Finally, air pollution monitoring devices will be placed at the base and on top of the hill.

A UNESCO report had singled out atmospheric pollution as the greatest danger to the monuments, and it called for immediate measures to prevent "the loss of the monuments forever." UNESCO established an international fund to safeguard the Acropolis treasures, but Premier Constantine Caramanlis said the money will be used to set up a "center for the study of methods of preserving ancient monuments."

The Acropolis is Athens' major tourist attraction with about three million tourists visiting it each year. KYRIACOS CONDOULIS

European nations declare a new water pollution policy

GENEVA—The 35th annual session of the United Nations Economic Commission for Europe (ECE) closed here by adopting a Declaration of Policy on Prevention and Control of Water Pollution including Transboundary Pollution.

Member governments—the major industrial states of East and West—are asked to adopt long-term policies to reduce existing water pollution and to prevent it in the future.

"The general principle should be adopted that, as far as possible, the direct or indirect costs attributable to pollution should be borne by the polluter," the declaration says.

It adds that countries sharing water resources should cooperate to improve water quality and pollution control. International cooperation should be promoted, including that within the ECE framework.

WILLIAM G. MAHONEY

Toxics ...

FOLLOWING A PUBLIC OUTCRY that a fungicide was affecting the health of 80,000 sugar cane field workers, CIBA-Geigy Laboratorios do Brasil S.A. has suspended the production of Merapicine-3, a mercury-based fungicide.

Company officials said that the product amounted to a very small part of the company's sales. The president of the Rio de Janeiro Physicians Union, Joao Carlos Serra, charged that as many as 80,000 workers in the cane growing area of Campos had been affected by Merapicine-3, which is sprayed in cane fields as pest control.

INDIA'S CENTER FOR MANAGEMENT for Agriculture has recommended that the Gujerat Government enact a law to protect more than five million farm workers who are exposed to the toxic effects of pesticides.

According to their expert study, the Factory Act already provides some protective measures, but there is no provision for the protection of farm laborers engaged in spraying or dusting pesticides in the fields.

One of the researchers, G. A. Patel, said that workers were not aware of the health hazards caused by the pesticide increase nor did they have any knowledge of the necessary measures to be taken during spraying.

ENGLISH ENVIRONMENTAL PRESSURE GROUPS, trying to reduce the amount of lead in gasoline, are bitterly disappointed with the conclusions of a Department of Health Working Party report, "Lead and Health," published March 28th.

The report concludes that food, water and air (in that order) are the main sources of environmental lead and that the bulk of the population are within the blood lead level requirements of recent EEC directives.

NO ACTION will be taken in Australia on the problem of lead in gasoline until well after middecade, if then.

Federal and state transport ministers Down Under have deferred a decision on the question of lead-free gasoline, or petrol as it's called there, for a further 12 months.

THE HONG KONG ENVIRONMENTAL Protection Committee (non-government) recently accepted the proposal put forward by oil companies to reduce the maximum lead content in gasoline by about 25 percent. Lead levels will be cut to a maximum of 0.6 grams per liter by July 1, 1981. At present, lead levels in locally sold gasoline have already reached harmful levels and have far exceeded the maximum levles allowed in the United States and Britain, according to a report published by the Hong Kong Consumer Council.

In Latin America...

THE BRAZILIAN GOVERNMENT has had to add 3 percent gasoline to the alcohol sold in service stations to prevent its use as an alcoholic beverage.

As part of the plan to convert the country's automobile fleet from gasoline to alcohol use, the government is subsidizing the price of alcohol—23 cents per liter, while gasoline costs 57—but the problem is that at this rate alcohol is cheaper at the pump than at the distilleries. Makers of alcoholic beverages are finding it profitable to buy alcohol at the pump, distill it with water and sell it as the cheap popular "Cachaca" drink.

The addition of even a small amount of gasoline adds color and a bad taste to the alcohol, which government officials hope will discourage its use as a beverage.

BRAZILIAN GOVERNMENT FEASIBILITY STUD-IES have shown that alcohol mini-distilleries would provide great economic and social ad-

vantages to the country.

The statement was made by Glauco Olinger, the president of EMBRATER, the federal organization that provides technical assistance to farmers. Speaking to the press in Brasilia, Olinger said he didn't know why there was oposition to mini-distilleries and challenged anyone to prove that big distilleries are more economically feasible than small ones.

He said that the standard mini-distillery project developed by EMBRATER and other governmental organs is one that can produce 1,000 liters of alcohol per day. Ideally, it could be operated by a farmer or a group owning about

200 hectares of land.

According to Olinger, itensive utilization of the soil and simple technology could dispense with the farmer's need for outside sources of energy and would be economically more viable than anything a big project can produce.

THE CHILEAN DEVELOPMENT CORPORATION (CORFO) recently announced that immediate development is foreseen for massive coal deposits found in the extreme south of the country, adjacent to the Strait of Magellan. According to Bruno Philippi, executive secretary of the national energy commission, use of coal to fire the country's thermoelectric power plants could in the future save Chile 19 percent of its petroleum imports, most of which are bought on the international "spot" market. Chile now consumes about 100,000 barrels of oil per day, and produces about 25,000 per day. The "Peckett" find, near the southern city of Punta Arenas, could reach two million tons production per year with an investment of \$100 million, Philippi said.

Brazil's biggest polluters agree to an emergency plan

RIO DE JANEIRO—The State of Sao Paulo has announced energetic measures to cut down on industrial pollution in the Cubatao region south of the city.

Camal Rame, regional director of CETESB, the state technology and basic sanitation company, met with representatives of 16 industries in the area to work out an emergency plan to cut down pollution.

Cubatao is one the most highly industrialized areas in Latin America and the site of some of the first big industries in Brazil, including the first Petrobras refinery. The area is often mentioned as an example of the worst case of pollution in Latin America. Although in the last few years Brazil has taken vigorous measures to reduce industrial pollution requiring controls on any new project, the plants in the Cubatao region were built as long as 20 years ago and are uncontrolled. The fertilizer, steel and petrochemical industries are mentioned as the worst offenders.

CETESB and other environmental organs have tried to cut down pollution in the past, but as Rame put it: "If we hadn't been having problems in controlling pollution we wouldn't have called this meeting."

The main problem seems to be money. Representatives of the 16 companies at the meeting complained they cannot afford the high cost of installing pollution control equipment. The COSIPA steel mill estimates it would cost \$200 million for it to stop polluting. Nevertheless, measures were adopted at the meeting. They include: a schedule for installing filters and other pollution control equipment; automatic pollution measurement apparatus and greater facilities for CETESB inspectors to operate in the plants.

GEORGE HAWRYLYSHYN



Government inaction follows major flooding in Argentina

BUENOS AIRES—Close to six million hectares (23,160 square miles) of some of the world's richest agricultural land became an inland sea in early May when east-central Buenos Aires province was flooded. Water masses, measuring up to 150 kilometers in width and moving at a rate of 15 meters a second, forced 36,000 people to evacuate their homes and caused 32 deaths.

The floods were provoked by 900 millimeters of rain falling over a ten-day period in an area of the humid pampa with an average yearly rainfall of 1,000 millimeters. Rivers and streams overflowed and then moved toward the Atlantic Ocean following the

inclination of the land.

The full extent of the damage is still not known, but unofficial sources put the loss to the public sector alone at \$200 million. This season's crops were completely destroyed and millions of head of cattle were believed lost.

Soil expert Jorge Molina claimed that the floods could have been avoided by the creation of artificial drainage areas in a highland region of six million hectares which would have contained the flood waters before they spilled onto lower ground. These man-made basins would be covered with humus to restore to the land its natural absorption capacity. This system was first proposed here by Florentino Aghino in 1884. The draining of hundreds of lakes may also have been a factor in the flooding.

Argentine President General Jorge Videla does not believe anything can be done to prevent future floods. He told reporters that "there is little man can do against natural disasters" and pointed out the region had not seen a flood comparable to this one since 1914. There were, however, heavy floods in November

The President also said that the experts themselves were not in agreement; some recommended deeper drainage canals while others warned that they might cause the water table to rise and destroy soil fertility. Thus no public works aimed at flood control are envisioned. BARBARA SCHAFFER

Chile's accidental geothermal discovery may be energy boon

SANTIAGO-What is being hailed by some in Chile as a major geothermal discovery of as-yet unknown proportions has been accidentally found at the bottom of a mineshaft.

As a 700-meter "sounding" was being carried out at the El Andina division of the Chilean Copper Corporation (CODELCO), some 50 kilometers north-east of Santiago in the Andean cordilera, the bottom of the shaft suddenly filled with heated vapor and water at a temperature of about 41 degrees Centigrade.

According to experts here, it is the first such "accidental" discovery in Chile, and it is being intensely investigated by CODELCO and University of Chile scientists to establish both the extent of the underground source and its commercial possibilities.

Professor Alfredo Lahsen, of the geology department of the University of Chile, says the find at El Andina could be a major new source of low-cost energy for Chile and for CODELCO, which is responsible for almost half of the country's annual export

Lahsen claims that Chile has "tremendous potential" in the geothermal field, but that "perhaps we have failed to convince the

authorities of this."

A representative of the Economic Commission for Latin America, based here in Santiago, agrees. He says that UNsponsored studies of the nation's geothermal potential have run into some political and diplomatic trouble. "Due to the UN's constant condemnations of Chile over its human rights record," says the official, "it is not surprising that they have lost some of the initial enthusiasm to work with us in this field."

Energy Sources...

ENERGY RESEARCH projects totalling \$25.7 million have been approved by the Australian federal government, much of it relating to coal

technology.

Some \$17.5 million is being used for research into coal mining, synthetic fuels from coal and oil shale, and the use of coal. Australia has abundant supplies of coal, and interest in oil shale exploration is reaching feverish heights with the announcement of a financial partner for the world's largest oil-from-shale project, the Rundle project, in Queensland.

The 187 projects were approved under the National Energy Research, Development and

Demonstration Program.

BRITAIN'S DEPARTMENT OF ENERGY is putting £1 million (\$2.3 million) into research on harnessing a by-product of power generation, waste heat, to heat certain city areas.

This follows the July 1979 publication of the Marshall Report, which suggested that by harnessing waste heat, Britain could save the equivalent of 30 million tonnes of coal a year.

Work, under the Department of Energy, local authorities and Electricity Supply Industry, is to start immediately with an injection of £250,000 to identify possible sites. One or two will then be chosen for full examination as possible pilot city schemes.

ONE OF EUROPE'S LARGEST and most technologically advanced solar energy plants, to produce one megawatt, is under construction near the Sicilian town of Catania at the foot of the volcano Mt. Etna.

It will start up in 1981, exploiting one of Italy's sunniest areas with an annual average of 7.2

hours of sun a day.

The solar energy plant, called Eurelios, is supplied with 182 mirrors, produced in France and Germany, which follow the sun's move-

The boiler, which produces steam for operating a turbine, is patented by Breda Ansaldo, an

Italian state-controlled group.

The cost of the plant is estimated at 10 billion lire (\$12 million), a non-competitive rate in comparison with nuclear power plants. However, many Italian industrial groups such as Fiat, Montedison, Ansaldo and Rende are pursuing and strengthening their research in the field of solar energy and have already built plants for some public buildings such as schools and regional offices in the Piedmont, Venetian and Liguria regions as well as for agricultural use.

Renewable Energy...

LOCALLY PRODUCED SUGARCANE will provide 14 percent of the fuel used by motorists in Zimbabwe by the end of May. Another one percent will be added from benzol, a mixture of benzene and other hydrocarbons.

Police cars have been testing the additives for the last six months and no problems have been encountered.

The government, which has been conducting experiments for two years, says the new blend will have the same octane rating but will cause less exhaust fumes.

The fuel blend will save millions of dollars in foreign currency requirements, the government said.

Advanced research into ethanol and benzol was the result of the seven years' guerrilla war, which caused the former Rhodesia to use two to three times the normal amount of fuels.

A SOLAR WATER PUMP, the first of its kind in India, has been installed in the Gujerat village of Awania to provide drinking water.

The pump was designed by Central Electronic Limited and the pumping system installed by the Central Salt and Marine Chemical Research Institute

The system consists of 16 solar photovoltaic modules, two lead acid truck batteries and a 125 watt DC motor. The total photovoltaic array capacity is 112 watts peak covering an area of 2.1 square meters.

The solar energy is stored in the lead acid batteries which in turn deliver the energy to the motor pump set. Water output is 2,000 liters per hour with a daily output of 7,000 liters.

THE NORTH EASTERN DAIRY Co. Ltd. at Kiewa, in Victoria, Australia, is using solar energy to pasteurize 13,000 liters of milk a day. The solar heating system, installed at a cost of \$81,000, supplies 55 to 60 percent of the diary's annual energy requirements for pasteurizing milk. Victorian Solar Energy Research Committee chairman, Roger Morse, said that the system will be closely monitored for the first 12 months and available data will be used to develop similar systems in other factories.

PAPUA NEW GUINEA is experimenting with producing methane gas from the waste pulp of coffee beans. Coffee is a major export.

The experiment is sponsored by the Coffee Industry Board and is being done by the business arm of the Wahgi Local Government Council, Wahgi Mek Plantations in the Western Highlands.

The gas can be used in coffee burners, heaters, and has other industrial applications. It has been claimed that methane gas from coffee pulp is stronger than the gas produced by other biogas plants.

South Africa's goal is energy self-sufficiency by 2000

JOHANNESBURG—South Africa, which has no natural oil resources, should be independent of imported oil by 2000, says Professor Richard Dutkiewicz of Cape Town University's Energy Research Institute.

At the moment, although the figure is secret, it is believed South Africa spends \$4.3 billion annually on imported oil.

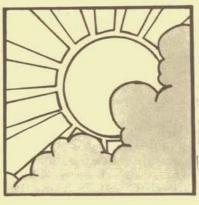
The Institute has issued a report, "Energy 1980," calling for a Ministry of Energy, for ethanol factories (not so much to produce cheap car fuel but to create jobs), for more research, more hydro schemes, petrol from recently discovered sea gas and for 10 percent of all cars to be battery-powered by 1995. There are about three million cars in South Africa.

It plays down the role of solar power as being likely to save significant quantities of fuel and, in fact, the roles of other alternatives such as wind, wave power, tidal power and geothermal power.

The report also attacks government secrecy on oil supplies and for having no discernible fuel policy.

Generally it believes the country's oil-from-coal will be its mainstay plus coal-generated and nuclear-generated electricity.

IAMES CLARKE



Saudi-U.S. solar energy program shows results

DHAHRAN—The Saudi Arabian University of Petroleum and Minerals (UPM) has just hosted a four-day Solar Cooling Workshop here which brought together American and Saudi specialists and observers from 14 developing countries. The workshop, jointly sponsored by the Saudi Arabian National Center for Science and Technology (SANCST) and the U.S. Department of Energy, was one of eight initial projects to be undertaken and funded under the Saudi Arabia-United States Agreement for Cooperation in the Field of Solar Energy (SOLERAS), which came into existence in October 1977. Each country pledged to donate \$50 million to SOLERAS over a period of five years to carry on a cooperative effort in solar energy.

As part of the project, solar cooling test laboratories are to be set up at four Saudi univesities—King Faisal in Dammam, King Abdul Aziz in Jeddah, the University of Riyadh and at UPM. Attention was focused recently on another SOLERAS project to construct a 350-kilowatt photovoltaic power system for two villages north of Riyadh, Al-Uyayhah and Al-Jubailah, with a combined population of 3,600. An agreement signed last December awarded the \$16.4 million design and construction contract to the U.S. aerospace firm, Martin-Marietta of Denver, Colorado, which will complete installation of a 50-kilowatt system next month; this is to be expanded to the 350-kilowatt plant by the beginning of next year.

Saudi Arabia is also home to the world's largest solar water heating system—just built at the King Abdul Aziz Airborne and Physical Training School in Tabuk. The water and space heating system serves 14 buildings on the 500,000-square-meter campus.

Educational programs undertaken by SOLERAS have included a two-week seminar for U.S. and Saudi students at the Solar Energy Research Institute (SERI) in Golden, Colorado, the first of which took place last fall. SERI, chosen by the SOLERAS Executive Board to serve as the operating agent for the program, has assumed responsibility for providing overall management of technical and financial aspects of SOLERAS projects.

ROBERT FRAGA

Israeli air quality standards may become more stringent

JERUSALEM—Israel's National Air Quality Monitoring Network has been fully operational for just over a year now and, on the occasion of its first anniversary, an annual report was issued telling Israelis just how clean—or dirty—their air is.

On average, Israel suffered less from sulphur dioxide and nitrogen oxide pollution than did the United States, the annual summary noted. Still there were violations of pollutant standards in Haifa, Ashdod, Beer-Sheeba and Tel-Aviv. (The network is comprised of seven monitoring stations located in or near the main population and industrial centers.)

The most severe air quality problem was that of total suspended particulates. Violations of the standards were noted in most Israeli cities. Staffers at the Israel Environmental Protection Service (IEPS) attribute the problem in part to Israel's dry climate and dusty desert areas. This does not negate the real possibility, they say, that man-made sources may contribute to the problem, especially in the Tel-Aviv region.

The 1979 annual report clarified and pinpointed Israel's air pollution problems and has thus paved the way toward development and implementation of new programs.

The IEPS has recommended establishing emission standards, completing and updating air quality standards, setting up efficient monitoring and control systems in local authorities, and preparing guidelines for use by Israeli planners.

Finally, to expand public awareness the IEPS, in cooperation with the Meteorological Service, is working on an air quality index that will translate scientific data into easy terms for the layman.

SHOSHANA GABBAY

Noise ...

RESIDENTS OF HAIFA, the industrial and commercial center of northern Israel, may soon learn to enjoy "the sound of silence" as a result of a new service sponsored by the Haifa Environmental Unit and Better Homes Association.

On a weekly basis, advice will be offered on noise problems resulting from such activities as building and home renovation. Possible solutions to the problems of impaired hearing caused by exposure to high noise levels will also be examined. A noted professor from the Department of Applied Acoustics of the Technion-Israel Institute of Technology will contribute his expertise to the general public on a voluntary basis.

THE SINGAPORE GOVERNMENT is being urged to examine the noise pollution problem in the island republic. Deputy Senior State Counsel S. Tiwari said that the local noise pollution control laws, which prohibit the operation of phonographs and loudspeakers between midnight and 6 a.m., are unsatisfactory and inadequate. There are no provisions dealing specifically with noise from construction sites and no local laws prescribing noise levels, he said. He also expressed concern over noise-induced deafness which was the top industrial disease for 1977 and 1978 in Singapore.

THE PHILIPPINE National Pollution Control Commission (NPCC) has launched an anti-noise campaign in downtown Manila. According to a NPCC spokesman, stores operating their sound systems beyond the permitted 65 decibels will face a fine of from \$27.40 to \$684.50 a day or even closure for persistent violations. Summonses have already been issued to 21 store owners in this respect.

BAVARIA'S Minister for the Protection of the Environment, Alfred Dick, told a meeting of about 500 acoustical experts in Munich that "more and more, noise is causing sickness in the working environment."

"Today noise protection has become one of the most important political challenges of our times," he said, noting that in Bavaria alone there were approximately 60,000 to 80,000 noise-injured workers alone. He labelled traffic noise as the major source of problems. Although it was important to take short-term protective measures, overall environmental planning was needed as a longterm solution, he said.

He cited the recently-passed Federal noise protection law as a praise-worthy effort that would cost the public about one billion marks a year. "Environmental protection that costs nothing does not exist," he added.

In Asia...

SRI LANKA, an island nation totally powered by hydro-electricity, has been compelled to turn to diesel turbines to meet a shortfall in the country's power needs caused by the delayed execution of major hydro-electric projects.

Previously, a single thermal plant of 25 megawatt capacity was the country's only fuel-burning power generating facility. It served as a back-up in times of severe drought. The Ceylon Electricity Board, has estimated a 100-megawatt hydro-power deficit by 1982. This would rise rapidly thereafter to 200 megawatts, said Power and Energy Minister D. B. Wijetunge, who recommended the urgent installation of the gas turbines and thermal boilers coupled with steam turbines.

Three big new hydro-power stations under the on-going Maheweli river diversion project, on which much of Sri Lanka's economic hopes rest, will not be ready until the mid-'80s, government officials said.

THE NATIONAL ENVIRONMENTAL PROTECTION Council (NEPA) of the Philippines will hold an ASEAN workshop on environmental impact assessment in June in Baguio city. NEPA will sponsor the meeting in coordination with the UN Environment Program. Top-level environment officials from various ASEAN countries are expected to attend the workshop. The officials will discuss the successes and failures of the implementation of the Environmental Impact Statement (EIS) system for development projects. They will also evaluate the EIS as a basis for future government actions.

"CRISIS IN THE MALAYSIAN ENVIRONMENT" may be the first film ever produced by a developing country on its own environmental deterioration. It was made by the Consumers Association of Penang in 16-mm color and runs 21 minutes. It costs about \$485 (or its equivalent). For further information contact: The President, Consumers Association of Penang, 27 Kelawai Road, Penang, Malaysia.

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A chemical fire in Sri Lanka leads to cabinet action

COLOMBO—A raging fire that gutted a warehouse containing large stocks of malathion imported to Sri Lanka for anti-malarial work has focused attention here on the need for proper storage of chemicals away from congested urban areas.

The odor of burned-out malathion, somewhat resembling the stink of rotten cabbage, was all-pervasive in most parts of Colombo for days after the fire.

Eventually, on the advice of the World Health Organization (WHO), authorities decided to haul it away to a southern suburb of Colombo where it was dumped into an old rock quarry and covered over. Residents of the area were assured that the rock bottom of the quarry dump ensured their water supply would not be contaminated and that they faced no danger.

The fire and its aftermath, which affected most parts of the capital, resulted in the Sri Lanka cabinet deciding that chemicals should not be stored in urban areas. The gutted warehouse was located in the highly congested Panchikawatte area next to a waste paper store where the fire originated. Steps are now being taken to locate chemical warehouses in sparsely populated areas with little fire risk.

MANIK DE SILVA

Six Asian nations cooperate on an environment program

BANGALORE—India will be the focal point for research and study in environmental management and wildlife conservation in the south Asian region.

The focal points project, in which India, Bangladesh, Pakistan, Sri Lanka, Iran and Nepal will cooperate on a wide range of environmental subjects, was announced at an expert group meeting organized by the United Nations Environment Program (UNEP) in cooperation with the regional center of technology transfer.

Pakistan will initiate work for the conservation of watersheds and Nepal for the mountain ecosystem, with an institute for studying the preservation of mountain flora and fauna. Sri Lanka will carry out the task of coordinating the national focal points. Iran, in cooperation with India and Pakistan, will work on the application and research of solar energy. And Iran has agreed to be the center for environmental quality standardization and for regional cooperation in wildlife conservation. Pakistan will study the conservation of ecosystems and watersheds, and Bangladesh would be the focal point for conservation of corals, mangroves, and delta and coastal areas.

Bhutan, Afghanistan and Maldives also expressed interest in participating in the program, but their representatives could not attend the conference.

At the conclusion of the six-nation meeting a South Asian Cooperative Environment Program (SACEP) was established.

R. MURALI MANOHAR

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SPECIAL REPORT Ecological politics strain Bangladesh-India relations

The view from Bangladesh:

DACCA—For the 28 million people who inhabit the Gangetic plain in southwestern Bangladesh, April and May are the driest months. Rivers lose their navigability, fields remain fallow, tubewells run dry and industrial plants close because of the low water level in the rivers.

It seems impossible in a country which has an annual average rainfall of 300 centimeters and which has countless rivers, including two of the largest in the subcontinent—the Ganges and the Brahmaputra.

But this precarious dry season is of recent origin and is related, ecologists here claim, to India's diversion of a large volume of Ganges water at the Farakka barrage (dam) 18 kilometers upstream from the Bangladesh border.

India and Bangladesh share both the Ganges and the Brahmaputra and a few other smaller rivers. Who should get how much of the total volume of water in each of these rivers is an issue that is yet to be resolved and is a constant irritant in their bilateral relations.

In an interview with WER, M.F.A. Siddiqui, a leading water resources expert here and the permanent Bangladesh representative to the Indo-Bangla Joint Rivers Commission (JRC), enumerated the major environmental problems due to the diversion of the Ganges water at Farakka, particularly during the dry winter months from November to May:

- Since the flow in the south-running rivers fed by the Ganges is reduced by two-thirds of the normal flow, salt water from the Bay of Bengal rushes upstream as far as 128 kilometers inland with the tidal current affecting sweetwater fish, power plants and forests. According to one estimate, salinity in the affected region has increased 13 times the normal level.
- The groundwater table is lower, making tubewells inoperative and affecting ground cover.

On the Subcontinent ...

INDIA HAS CLAIMED SOVEREIGNTY over an island being formed in the Bay of Bengal from silt washed down the Ganges from the Himalayas (WER, Feb. 26, 1979, p. 8).

The crescent-shaped island was first noticed in 1975, recorded by the Naval Hydrographic Survey and picked up by satellite a little later. The aerial photograph section of the Survey of India prepared a report which went to then-Prime Minister Morarji Desai, who asked the West Bengal government to administer the island. Officials believe Purbasha island—as it has been named—might become one of the biggest in India.

It is feared that with the onset of the monsoon this year flooding rivers might fragment the new island so the district forest division has proposed planting casuarina, cashew, and thorny bushes on it to stop its erosion.

INDIA'S PETROLEUM MINISTER Veerendra Patil said, "There is a possibility of government curbs on the use of oil in order to conserve petroleum products."

There was no alternative but to go for regulation in view of mounting oil bills, he stated, if the consumers themselves do not bring down consumption.

The minister said India's oil bill might exceed the \$6.25 billion mark very soon. If the OPEC countries increase the price of oil again, it may be another \$1.25 billion. He feared it would take the entire foreign exchange earnings of the country if the necessary measures to conserve oil stocks and achieve self sufficiency were not taken forthwith.

THE PROBLEMS OF SQUATTER SETTLEMENTS

and the improvement of slums was the subject of a nine-day seminar-workshop held recently in New Delhi, India. Experts from nine Asian countries and UN agencies attended. It was organized jointly by UNESCO, the Foundation for International Training, Canada, and India's National Building Organization.

P. O. Sethi, India's Minister for Works and Housing, said if his country's slums were to be provided with basic amenities over the next five years, it would take an investment of \$562.5 million. He asked that international agencies like the World Bank involve themselves in this problem to a greater extent by giving loans on easy terms so that slum dwellers could build their own houses.

- Siltation of the river beds has increased as has the rate of shoal formation.
- The rate of evaporation from the rivers has increased due to reduced volume of water carried.
- The mangrove forest of Sunderbans (home of the Royal Bengal Tiger) survives on subterranean sweet water although the land remains flooded by salt water from the Bay. It has been found that with the lowering of the groundwater table elsewhere, the subterranean sweetwater level in the Sunderbans is also affected.

At a recent seminar on remote sensing technology, Mahbub Uhdin Chowdhury, director of the US-aided LANDSAT satellite program here, said that the course of the Ganges in Bangladesh has shrunk by 18 percent during the last five years due to the reduced flow in the river. Chowdhury's findings are based on satellite pictures of the river taken in 1973 and 1978. Chowdhury said that shrinkage of the river course has increased erosion, leading to destruction of croplands and homesteads.

Local ecologists believe that unless India and Bangladesh can arrive at an environmentally safe formula for sharing the water of the Ganges, environmental problems here will become even worse.

AHMED FAZL

The view from India:

BOMBAY—The dispute over sharing the waters of the mighty Ganges river not only has grave political implications for India and Bangladesh but even more importantly the environmental changes caused by building the Farakka barrage affect the lives of millions of people.

The Indian Government's position is that the Ganges flows through 8,000 kilometers of Indian territory, covering a catchment area of 777,000 square kilometers. The river thus controls the lives of well over 200 million people.

By contrast, the Padma—which the Ganges is called once it enters Bangladesh and flows into the Bay of Bengal—only flows through 160 kilometers with a catchment area of 5,180 square kilometers and affects 12 million inhabitants (note differing Bangladeshee claims).

After protracted negotiations, which began 30 years ago when Bangladesh was part of Pakistan, the two countries came to some agreement in 1977 on the Farakka barrage, which controls the release of water. India will now get more water than was earlier agreed to in the leanest season—the last 10 days of April. This, among other things, should ensure that the flow of water to the now neglected port of Calcutta (the capital of West Bengal State) will increase in summer and prevent it from being silted.

The problem that both countries face is indeed paradoxical: acute shortage of water in summer (a drought this year) and floods in the monsoons. In view of the devastation caused by floods every year, India has proposed that the two should hammer out a long-term solution on the understanding that the river systems are common.

But Bangladesh argues that the Ganges-Padma should be treated as separate, and India can solve its problems by damming the Ganges at about 30 places while Nepal, their northern neighbor, will do so in a dozen. India would also like the huge Brahmaputra river to be tamed by constructing dams and barrages as part of its integrated approach.

Flood damage to cultivable land—more than 60 million hectares in the Ganges basin of India and over 2 million hectares around the Padma—is probably the biggest single ecological hazard in the world in terms of the number of people affected (the Gangetic

plain is both countries' granary).

India proposes that the Brahmaputra be linked to the Ganges just north of Farakka by constructing a half-mile-wide canal. Bangladesh is strongly opposed to the idea on the ground that it will divert more water than has already been gifted to India in an

allegedly "unequal" treaty.

It is imperative to the economies of both countries that some amicable compromise be found to cope with the yearly visitations of drought and floods and their attendant problems—soil erosion and silting. Yet recently Mrs. Gandhi's Bengali cabinet minister, A.G. Chaudhury, demanded revision of the agreement. He wants India's share doubled to flush the silt accumulating in Calcutta port. The Economist magazine called his demand "highly irresponsible" as it would leave Bangladesh with hardly any water in a DARRYL D'MONTE year of drought.

Integrated master planning urged to combat Indian floods

NEW DELHI-India's National Flood Commission has recommended that master plans be prepared for water resource development and flood control in all river basins and that river basin authorities be set up.

It also asked that water resource development be linked to land use plans for optimum production over the long term.

The Commission report, presented on March 21 in Parliament, has as its goal a comprehensive multi-disciplinary approach.

Besides calling for afforestation, it also recommended an integrated action plan for soil conservation and watershed management.

It suggested this could only happen through closer cooperation between government agencies.

The commission said that anti-erosion work should focus on protecting towns, industrial areas, groups of thickly populated villages, railway lines and roads.

Their report said that funds for major schemes and inter-state projects in flood control should be earmarked by the central government. But, it warned, unless funds for proper maintenance are assured, it would be unwise to undertake new construction projects. R. MURALI MANOHAR

Water Quality . . .

SOME 65 PEOPLE LOST THEIR LIVES due to gastroenteritis when they had a holy dip in a polluted temple pond in Karimnagar, India. Immediately after the tragedy the stagnant water was tested and found contaminated.

Madan Mohan, the Andhra Pradesh State Health Minister, ordered the temple closed to pilgrims until the pond was cleaned.

SOUTH KOREAN PROSECUTOR-GENERAL Oh Tak-kun recently told district prosecutors in Chunchon, Chongju, Suwon and Seoul to investigate all industrial facilities along the Han River. Prosecution office sources said owners of factories or mines discharging excessive wastes will be arrested. The prosecutor's office will also consider closing or removing factories and mines when necessary.

SEOUL CITY is conducting an intensive survey on 325 pollutant-discharging industrial firms in an effort to prevent the Paldang reservoir, a major source of potable water for the capital, from being contaminated, according to Seoul

Meanwhile, the South Korean government has prepared a comprehensive plan to control pollution in the Han River, the largest river in the nation. Some 30 percent of the country's population live near it. The measures include prohibiting the construction of new factories on both sides of the river and relocating the existing pollutant-emitting firms from the river banks to special industrial complexes to be constructed. Eight cattle-breeding farms and 10 hog-raising companies will be supervised for control of pollutant emission. The Han River Preservation Committee will be created in the Office of Environment this Spring to prepare appropriate measures for purifying the Han River.

AN INTERNATIONAL SYMPOSIUM on river sedimentation, attended by scientists from 14 countries, was held in Peking recently. During discussions, a Chinese participant proposed setting up a sediment research center in Peking to coordinate research domestically and promote international cooperation in that field.

China has a network of 2,190 gauging stations on the country's major rivers, over 1,000 of

which measure river sediment.

Environmental investments . . .

IN URUGUAY, a \$111 million project will assist livestock ranchers, farmers and dairy producers in colonies of the National Settlement Institute. The investment project, which has a \$24 million World Bank loan, will make credits available for seeds, fertilizer, fencing, water, machinery, breeding stock. It will help the settlers to improve agricultural techniques and production patterns on more than 3,000 farms and ranches, many of which currently suffer from soil erosion and depletion.

Agricultural products represent nearly 90 percent of Uruguay's total merchandise exports, even though this sector accounts for only about 15 percent of gross domestic product.

THE AUSTRALIAN SUGAR PRODUCER, CSR Limited, is studying the feasibility of an ethanol industry in the Ord River area.

Ord River, Australia's \$100 million attempt to make flowers bloom in the desert of Western Australia (see WER March 10, p.8), is still under cultivation. CSR had been responsible for an original Ord River sugar industry study.

A private company has submitted a proposal to the Western Australian government to establish a \$90 million ethanol industry, based on production from 9,000 hectares of sugarcane in the Ord. Land already available under the present Ord scheme could add up to 10 percent of all gasoline used in that state.

NEW FACTORIES in China will be required to have appropriate pollution-control facilities, according to Li Chaobo, Director of China's Environmental Protection Office.

Many of the approximately 400,000 Chinese enterprises at present do not have pollution-control equipment. About 90 percent of industrial wastes dumped into rivers, lakes and seas are not treated.

China's industry and heating facilities release more than 10 million tons of soot and 15 million tons of sulphur dioxide into the air annually.

THE NAVOTAS FISHING PORT and fish market in the Philippines has built a \$506,849 ice plant driven by solar energy. Soaring oil prices and the expanding fishing industry have compelled the construction of ice plants and other fishing facilities using non-traditional sources of energy. In addition, 15 solar driers have been distributed to fishermen to familiarize them with the technology. The Philippine National Electrification Administration is in charge of the distribution of the solar driers in cooperation with the Ministry of Natural Resources.

UNEP's lack of funds slows its program development

NAIROBI—The two-week-long UNEP Governing Council meeting just ended here made no significant moves in program direction, said one official. Rather, it was a "wait and see session" that took care of old and continuing business.

The wait is for a special session of the United Nations Environment Program Governing Council to take place two years from now. At that time there will be a 10-year review of UNEP's program by member governments—a stocktaking to see whether the agency needs reorganizing. So this year's meeting—and probably next year's as well, said the U.N. spokesman—will hold to the status quo.

Even the status quo is being delayed for lack of funds. Contributions for the Environment Fund are only about 83 percent of the 1978-1981 target: \$150 million is needed but so far that goal is \$24.6 million short. Even so, said one U.N. participant, although the program has been slowed down, "compared with other U.N. agencies, we are not doing too badly." At the meeting, Sweden, Denmark, Norway and the Netherlands expressed interest in giving additional contributions to the fund for use in developing countries.

A small bright spot was the first contribution to the desertification fund—\$100,000 from Mexico. So far the affected countries have not made desertification a top priority; therefore, donor countries have not felt compelled to give aid beyond that allocated for their bilateral programs.

Progress was made in certain areas. UNEP Executive Director Mostafa K. Tolba was asked to convene a senior level meeting of environmental law experts, pushing UNEP more into the field of law and regulation, a controversial move in the past.

The eighth Governing Council also passed resolutions on weather modification, chlorofluorocarbons and toxic wastes.

Weather modification (i.e., rainmaking or stopping) should be dedicated to the benefit of mankind and the environment. The resolution said states should notify other states which might be affected by weather modification activities so as not to damage the adjoining states' environment.

On chlorofluorocarbons, the GC recommended reductions in their use and the development of ways to control their release into the atmosphere.

The resolution on hazardous chemical wastes urges governments to institute adequate protection measures, to exchange information on these measures, and to develop notification procedures and controls for international transfers of hazardous wastes. UNEP was asked to help in developing guidelines.

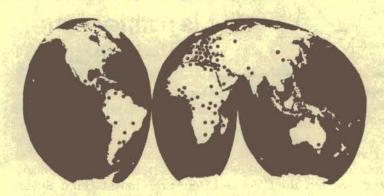
Politics once again entered this technical arena. Some time was spent hammering out resolutions—at the behest of the developing nations' Group of 77—calling on UNEP to assist the Palestinian people and another condemning apartheid and calling for the end of all forms of cooperation between UNEP and South Africa. Since UNEP does virtually nothing in South Africa, this resolution will have little effect.

CHARLES HARRISON

The UN is evaluating its environmental information

NAIROBI—To increase its effectiveness, a full-fledged evaluation of UNEP's worldwide environmental information network was recently launched. This independent evaluation of INFOTERRA is being carried out under the guidance of Unesco's UNISIST General Information Program, which was set up to provide a conceptual framework for international cooperation in the field of information.

The evaluation team will interview staff from 36 of INFOTERRA's 108 national focal points around the world. Information will also be obtained from a representative selection of INFOTERRA sources, users and cooperating U.N. agencies.



One important task of the evaluation team will be to assess carefully the relationship between INFOTERRA and the environment-related information systems of other international agencies, particularly those within the UN system.

One problem repeatedly cited in coordinating efforts is the proliferation of systems. This proliferation often results in duplication since all draw upon virtually the same pool of information sources and differ only in their choice of indexing terminology. The recent spate of decisions at major conferences urging the creation of new referral systems in various areas will not doubt render coordination between systems even more difficult.

Participants at the first INFOTERRA evaluation meeting (held in March) decided that their team should give particular attention to the problems of "interface" between international systems and that the results of their studies should be examined carefully by INFOTERRA, UNISIST and the UN's Inter-Organization Board for Information Systems (IOB) in an attempt to produce a rational plan for the further development of INFOTERRA.

When the evaluation is completed, the results will be discussed and analyzed at a second and final joint session of the team and advisory group in early November and reported to the Executive Director of UNEP for use in planning future development of INFOTERRA.

INFOTERRA, previously known as the International Referral System for Sources of Environmental Information (IRS), was established by UNEP following the United Nations Conference on the Human Environment, held in Stockholm in 1972.

International cooperation...

FIVE INTERNATIONAL ORGANIZATIONS and five governments along the west coast of Latin. America are working together to develop an action plan for the South-East Pacific—which means the coast and coastal waters of western Latin America. Day-to-day coordination will be handled by the Permanent Commission for the South Pacific, a regional organization involved in coastal resource management there since 1952.

Two years ago, a workshop on marine pollution in the region was held in Santiago, Chile. This led to the commission joining forces with four interested UN agencies. And in January of this year the 14-month project to develop an action plan was approved by UNEP.

Its first job will be to collect information on the state of pollution in the region and the capabilities of marine research institutions to

THE SOUTH PACIFIC Regional Environmental Program, covering an area extending from Papua New Guinea as far east as the Tuamotu archipelago, was launched earlier this year in Noumea, New Caledonia.

The first phase, which has already begun, will entail Pacific governments establishing environmental priorities and then preparing country reports on their policies and special ecological problems. This should take about 18 months.

Support will be primarily from UNEP in cooperation with the South Pacific Commission, the South Pacific Bureau of Economic Cooperation, the Economic and Social Commission for Asia and the Pacific, and UNEP's regional office there.

THE SECOND WORLD WILDERNESS CONGRESS, (the first, attended by 1500 delegates from 26 countries, was held in Johannesburg in 1977), will be at Cairns, Queensland, in Australia, June 8-13.

Among the 40 speakers will be such diverse wilderness experts as a Zulu chieftain and an aboriginal artist; a biologist and an ecologist both working for mining firms.

At least three papers will be presented on Australia's Great Barrier Reef which, fittingly, is offshore the host city. Ironically, one sponsor, the state government of Queensland, has pressed for permission to drill for oil offshore posing, conservationists say, a hazard to the unique reef.

Efforts to have the entire reef region placed under the same legal protection recently afforded its Capricornia section have been redoubled. The Australian Conservation Foundation wants the entire 500,000-square-kilometer reef region fully protected. A promotional campaign was launched on 40 television stations in Australia in March.

In Europe . . .

SWEDEN'S Product Control Board has decided it will be impossible to implement the government's decision to ban cadmium in certain products by July 1st (WER, Jan. 14, p.6).

"Nobody suspected when the proposal was made and the government made its decision that there was so much cadmium in circulation," said the Stockholm paper Svenska Dagbladet. It said that total imports had been estimated at about 60 tons a year, but a German report dealing solely with cadmium as dye pigments and as a stabilizer said the total was around 200 tons just from the EEC countries.

So, the Product Control Board requested a postponement of the ban until January 1, 1983. "The extent of cadmium use really shows how important it is for us to do something about management," said Ingrid Kokeritz, who heads the agency. "This explains the latest figures of atmospheric cadmium fallout over Sweden—60-100 tons annually. To date, Sweden has been the only country to respond to a warning from the World Health Organization to limit the dispersal of cadmium. We must hope that others will follow our lead."

THE IRISH GOVERNMENT is considering converting natural gas to methanol as a petrol (gasoline) additive.

Ireland's Energy Minister George Colley said the difficulty was not in the technology but in the economics of the process.

Ireland's only natural gas—from the Kinsale field—is nearly 99 percent pure methane. But converting it to methanol would require construction of a multi-million dollar liquefaction plant in Cork.

However, environmentally the use of methanol would be beneficial: it would reduce lead emissions from the 292 million gallons (1.3 trillion liters) of gasoline Irish motorists burned last year. And, of course, it would reduce expensive oil imports.

A NEW ORGANIZATION, the Irish Electric Vehicle Association, has been set up with the cooperation of the National Board for Science and Technology and the European Common Market to promote electric vehicles in Ireland.

It brings together representatives of industry, education and state agencies.

Between 500 and 600 electric vehicles are in operation in Ireland at present, but mainly for milk and bread deliveries where high speeds and long distances are not involved. Commercial delivery vehicles and short-range buses are reckoned to be among the most suitable vehicles for the change-over to electric technology.

At the Irish Motor Show a vehicle capable of doing 113 kilometers at 80 k.p.h. before needing a battery charge was demonstrated.

Since it became operational in January 1977, INFOTERRA has assisted hundreds of individuals and institutions all over the world in locating scientific and technical information provided by its 7,800 registered sources. Through it, users have access to information and expertise covering 1,000 categories of environmental concern.

SPECIAL TO WER

The address of your nearest national focal point can be obtained by contacting INFOTERRA Program Activity Center, UNEP, P.O. Box 30552, Nairobi, Kenya. Telephone: 333930; Telex: 22068; Cable: UNITERRA Nairobi.



The Baltic Sea Convention is ratified after seven years

COPENHAGEN—It has taken seven years, from start to signing to ratification, to produce a convention that all seven Baltic countries could agree upon to protect their mutual sea, but finally it came into force on May 3rd of this year. Its regulations are among the most stringent in the world.

The countries involved—Finland, East and West Germany, Poland, Sweden, the USSR and Denmark—have taken it all very seriously, a spokesman said. Although those connected with the convention feel the founding members were a little too optimistic about the dates originally set for compliance in certain areas, the spokesman said of the working commission: "It is a beautiful forum. It is technical and we never discuss politics. Our one concern is to prevent maritime pollution."

The pollution they are preventing is that caused by oil, noxious liquid substances, land-based pollution, chemicals in containers, and the discharge and dumping of harmful substances from land-based ships.

The delay in ratifying the convention arose not because of disagreements but because of difficulties in coordinating translations of the original English texts, especially between East and West Germany. West Germany, the last to ratify on March 3rd, had the additional hold-up of having to contact its 11 regional governments for their approval—even though many of them have no maritime borders.

Each country will monitor its territorial seas, and the convention's scientific and maritime working groups will discuss monitoring the open sea. Decisions made in Helsinki, where the permanent commission will be based, must be unanimous. But even before final ratification, the signatories were basing legislation on the Baltic Convention.

And work continues: In August, Denmark will host a meeting on combatting oil pollution and, later on, meetings on ship safety and pollution prevention will be held in Stockholm.

CONSTANCE CORK

In West Germany, environmental protection is a big business

BONN—In West Germany environmental protection measures account for 5 percent of all new industrial investment, and it is two to three times larger in the paper, chemical, steel and electric power industries. This has created over 100,000 new jobs in the

past three or four years.

Federal Chancellor Helmut Schmidt, opening an environmental exhibit, stressed the intimate relationship between environmental protection, the recycling of waste products, notably glass, paper, oil and automobile tires, and fuel conservation. Last year Germany's oil import bill increased by roughly 60 percent to DM45 billion (\$26 billion) and is expected to go up to DM60 billion this year. The only short-term relief from this burden, he said, is through the expanded use of coal, Germany's only abundant fuel. Accordingly, the government recently authorized the construction of fourteen plants to convert coal to oil and gas (at a cost of around one billion marks per plant), a step he acknowledged would add to environmental pollution. Thus, by inference, he dumped the problem into the lap of the environmental industry to solve.

J.M. BRADLEY

An Irish chemical company doesn't waste its wastes

DUBLIN—Ireland's state chemical company is making conservation headlines by its use of waste materials.

Nitrigin Eireann Teoranta (the Irish Nitrogen Board) is government-owned and the sole manufacturer in Ireland of basic heavy chemicals. At Marino Point in Cork Harbor it has opened a 1,350-tons-a-day ammonia and 1,000-tons-a-day urea plant, manufacturing fertilizer products for the agricultural industry at home and abroad from the nation's only find of natural gas, at Kindale Head.

It has also developed a highly successful program to use the byproducts. It is the largest supplier of carbon dioxide in Ireland (from ammonia) which it supplies to the brewing and mineral water industries to provide the bubbles in beers, lagers and soft drinks.

The company is now looking at other ways in which it can develop its resources. At Marino Point, as reported in WER February 25, it has achieved a phenomenal rate of waste heat use: 80 percent of the power needed for this fertilizer plant, which is one of the six largest in the world.

A NET company spokesman explained that they were aware the chemical industry was closely watched by environmentalists and were anxious to show that it could achieve great benefits for the nation.

To prove this point, they have refurbished what is believed to be the only orangery in Ireland. Underneath the towers of the ammonia/urea plant, oranges, lemons and other fruits not native to the country are growing profusely.

TOM MacSWEENEY

Recycling ...

THE EAST GERMAN GOVERNMENT is dramatically increasing the prices paid to people taking paper and other waste material to official collection points for recycling. The announcement followed a decision in March to raise the

price paid for metal scrap.

According to East Germany's Communist Party daily "Neues Deutschland," the price paid for old newspapers and magazines will be doubled from 15 to 30 pfennigs per kilogram while books will be hiked to 20 pfennigs instead of the former five. Giving another example, the paper said that the price will go up from five to 30 pfennigs for certain types of glass jars and bottles.

IRISH SCIENTISTS believe they can save farmers up to £100 million (\$205 million) a year on fertilizer costs by using animal wastes instead. A national seminar in Galway was told that animal wastes were a valuable source of plant nutrients and should be collected and managed more efficiently.

The conference was also told that scientists have discovered another way to save money, by developing a unit capable of producing methane gas cheaply from pig slurry. Research work on the unit has been carried out in University College, Galway, and it is now practically ready for commercial application.

THE CONVERSION OF TRASH INTO TOILET PAPER has been a success, Japan's Ministry of International Trade and Industry and the Industrial Science and Technology Agency announced jointly.

The 4.5 billion yen (\$18 million) household trash recycling project, dubbed "Stardust 80," was begun in fiscal 1976 using a pilot plant built in Yokohama where wastepaper was automatically separated from household trash and processed into pulp. Normally about 43 percent of household trash is paper, the ministries said, and about 20 to 25 percent of this paper is separated at the plant.

The remaining wastepaper is either burned to produce city gas or processed into "farmyard

manure.'

The pulp has been processed into a total of 40,000 rolls of toilet paper of a quality comparable to that already on the market.

An estimated 46,000 rolls could be obtained from the trash of 100,000 people and sold at half the market price, the officials said.

In the Middle East . . .

MANY OF THE TREES planted in Cairo earlier this year to green the Egyptian capital (WER, March 24, p. 6) have been destroyed by vandals. Some lost all their branches while others were chopped in half. City officials apparently feared something like this might happen because they specifically appealed to the public not to damage the trees. The appeal didn't help.

A RECENT ISRAELI POLL of a representative sampling of 1191 men and women over the age of 18 shows that the Israeli public is aware of environmental problems in the realms of air pollution, cleanliness in public places and noise in public domain.

Of those questioned, 65 percent stated that a problem of air pollution exists in Israel; 64.1 percent were troubled by the problem of cleanliness in public places; and 59.3 percent felt that a noise problem exists as well. Only a very small percentage of those polled (less than 4 percent) felt that these three problems are totally non-existent in this country.

While awareness of the three environmental problems was distributed among all sectors of the general public, it was more pronounced within the higher socio-economic levels. The 18-29 year-old age group found the problems of noise and cleanliness to be less acute.

JORDAN's future economic and social development are being affected by an inadequate and unsafe water supply, soil erosion, water pollution, insufficient technical and professional manpower, and dependence on imported oil. These conclusions, printed in a recent U.S. National Academy of Sciences News Report, came from a meeting last year between a National Research Council panel and Jordanian scientists and government officials.

Because there is no Jordanian agency responsible for environmental protection, the panel recommended a series of U.S.-Jordan studies on ways to control environmental problems.

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Foreign investors are wary of Egypt's desert cities plan

CAIRO—Will Egypt's determined effort to build seven all-new cities in the desert help relieve the congestion and urban sprawl that is plaguing Cairo?

Only 4 percent of the nation's land mass is viable agricultural land, and this resource is being seriously strained by a burgeoning population. Good agricultural land has been giving way to tall apartment buildings and new manufacturing plants. To stop this, the government has made it illegal for new industry to build on agricultural land. A policy of building new cities and "conquering the desert" was devised to relieve the population strain and as sites for new industry. Seven new cities are going up at once and one of them, Tenth of Ramadan, was to receive its first residents in April.

Some experts are skeptical about the plan's success. To date, not a nickel of foreign financing, either private or governmental, has gone into the building of the cities. Westerners are wary: Can the investment pay off, given the poor track record of new cities elsewhere in the world? And they are frightened by the huge amount of capital it takes to create and sustain a new city.

However, in something of a mini-breakthrough, USAID has decided to finance a \$1.4 million study to look at all the implications of urbanization and new town development and then come up with a clear policy to guide future decisions on aid requests for the new cities. This represents a major shift on the part of USAID which up till now has not considered the new cities a priority in their financing policy.

Egyptian officials have exhibited no such skepticism, nor in fact has the public. Until the government put a stop to it, many were buying land in the desert for purposes of speculation—demonstrating a popular belief that the communities will succeed.

A look at Tenth of Ramadan shows the government's concern for making desert living pleasant, attractive and practical. All of the cities have been situated to take advantage of cooling breezes from the northwest. Much attention has been devoted to making the cities green, giving them an "oasis in the desert" look. There is room for gardens, grass patches and trees throughout, and extensive plantings have begun. In each of the cities a shelterbelt of trees about 70 meters deep will screen inhabitants against blinding sandstorms. Factories and industrial plants have been placed on the outskirts, downwind from residential areas. Growth and expansion will take place away from the factories.

But to what extent will the new cities be able to arrest urban sprawl along the Nile and relieve the crowding of Egypt's two largest cities, Cairo and Alexandria? Egypt's population is already 40 million and growing by 1.2 million a year; the seven new cities are slated to accommodate just four million people by the year 2000. No one believes they are the only answer. Peter Amato, the man who will direct USAID's urban policy study, says, "It might just be that Egypt will have to opt for a multifaceted approach—new cities and more efficient use of its existing urban space. We must remain open to all ideas."

MILAGROS ARDIN

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French nuclear expansion angers neighboring countries

BRUSSELS—A three-page letter of instructions—"don't panic," "don't pick fruit or vegetables"—outlining what to do in the event of a nuclear accident has been given to French citizens living near a nuclear power plant being built in France just two kilometers from the border with Belgium. This letter, however, was not sent to Belgians across the border, further angering Belgian authorities and citizens alike who have long opposed the plant.

Electricite de France (EDF) announced in December that construction on the first of four 1300-megawatt reactors in Chooz would begin in 1980. At that time, Belgian critics contested the decision, arguing that since Belgians would be as affected as the French, referendums should be held in both countries before construction was approved.

But EDF, which is pushing ahead with the western world's most ambitious nuclear power program, launched an extensive public-relations campaign to discredit Belgian critics. The opponents argue that the Chooz reactors will harm marine life in Belgium's largest river, the Meuse, and could threaten the safety of the densely populated southern part of Belgium.

EDF plans to build 35 nuclear power plants in the next five years, about two a month in 1980 alone, so that by 1985 the country will have 52 reactors generating more than 50 percent of France's electricity.

The French power company also has angered people in West Germany and Luxembourg by going ahead with plans to build the third of four reactors at Cattenom, on the Moselle River, where the French, West German and Luxembourg borders come together. When completed—in 1982-83—the Cattenom complex will be the largest nuclear power facility in the world, turning out some 5200 megawatts of electricity. Cattenom is also only 20 miles from the Belgian border.

Critics in West Germany and Luxembourg argue that it will defile the beautiful landscape of the Moselle region; jeopardize the security of the population (French laws regulating reactor construction are not as strict as they are in West Germany); possibly change the climate of the wine-growing Moselle region; and threaten the health of the Moselle River itself.GARY YERKEY

In Europe ...

SIX FARMERS IN CORK, Ireland, have killed a proposal to dump toxic industrial wastes on their land.

The farmers, extensive land-owners of rich dairyland, had fought the County Council through the courts to prevent them taking land tests preparatory to setting up a toxic dump.

Such a dump is regarded as essential for industrial development, and there have been confrontations between the local government authorities and environmentalists during the Council's search to get a dump.

The protracted court proceedings lasted over a year.

THE CITY OF LISBON plans to turn over its gardens to young people, its president, Nuno Abecassis, announced. Lisbon's town hall will open a gardening school for students who will then be put in charge of maintaining the city's gardens.

A LEADING BRITISH BIRD dealer has been sentenced to six months prison and fined £200 (\$430) for smuggling rare birds by falsifying their identity on import and export forms and disguising their real value.

MALARIA IN TURKEY once again is being eradicated, according to Turkish health authorities. The number of cases dropped to 24,744 in 1979, compared with 115,512 in 1977.

The irrigation systems in the southern provinces provide a favorable habitat for malaria mosquitos, which have become immune to most insecticides. The only effective chemical has proved to be malathion. Turkey spent \$35.7 million in 1979 to fight the disease, including \$1.6 million in foreign aid from various European countries.

AN ENVIRONMENTAL CONFERENCE in Moscow, attended by specialists from 17 nations (10 western), discussed problems of waste technology particularly in the cellulose industry, steel mills and the chemical industry.

ONLY 15 PERCENT OF POLAND'S SEWAGE is being fully cleansed, 35 percent partially, and 50 percent not at all, the weekly ITD reported. The paper added there are 15,000 sources of sewage in the country. Some 1,500 factories have no cleansing installations, nor do 468 towns. Among them are the two biggest cities in Poland, Warsaw and Lodz.

Portugal will have an energy plan by the end of the year

LISBON—Portugal should have a medium- and long-term energy plan by the end of this year. An energy model is being prepared by Portuguese technicians, the European Economic Community (EEC) and the University of Grenoble in France to analyze the economic consequences of different energy strategies until the year 2000. The study, financed by the EEC, includes consumption and cost forecasts for various energy sources.

At the same time, through the International Energy Development Program, the United States is funding a long-term energy assessment project covering problems and an inventory of solutions. Both reports will be ready by the fall, making it possible for Portugal's energy board to set the pattern for the future.

This year Portugal must import \$2.4 billion worth of crude oil. "It's hard for small countries caught up in the energy crisis to develop alternative energy sources quickly," said Sidonio Paes, general director of the energy board. "R&D is very expensive so a lot depends on the amount of international support and cooperation a country can get."

He said Portugal must import more coal in the short term despite its polluting effects. But the board is studying the feasibility of importing natural gas from northern Spain, which is much less polluting.

An all-out effort will be made to apply conservation measures to avoid the current wastage of nearly one million tons of oil annually while incentive schemes for developing renewable energies will be introduced.

MARY MILLS

For plants with potential, forget the Amazon, go to Kew

LONDON—In the drive to discover the medicinal and industrial properties of plants as replacements for dwindling mineral resources, a desk at Britain's renowned Botanical Gardens at Kew may take scientists further than an expedition up the Amazon.

But funds need to be raised for the five-year research project into five million or more plants in the Kew Gardens Herbarium. Its purpose is to discover the estimated 0.4 percent of plants that may be of medicinal, industrial or agricultural use in drugs, oils and rubber, dyes, fibers, etc.

An even larger collection of plants exists in Kew's museum of economic botany, which has been too busy—since 1867—to catalog them.

A museum spokesperson said: "Every time we hear of an expedition going up the Amazon to look for some medical herbs, we look at each other. We've probably had the stuff they're looking for for the last 120 years."

BARBARA MASSAM



Action is urgently needed to stop depletion of ozone layer

OSLO—European and North American officials meeting here unanimously concluded that steps to reduce the emission of chlorofluorocarbons into the stratosphere are urgently needed.

Scientists believe that the increasing use of chlorofluorocarbons (CFCs) is depleting the ozone layer of the earth's stratosphere. Ozone depletion increases the amount of ultra-violet radiation reaching the earth and could cause an increase in global temperature, leading to reduced crops and harmful effects on micro-organisms, and possibly an increase in skin cancers. The U.S. National Research Council recently projected that continued use of CFCs in aerosol cans, refrigerators, air conditioners, plastic foams, solvents and elsewhere will result in a 16.5 percent ozone depletion—half of that within the next 30 years.

Although some steps toward reduction in the use of CFCs have already been taken, officials attending the meeting here agreed that adopting a wait-and-see policy was not acceptable. "Due to the slow movement of CFCs into the atmosphere, necessary measures cannot be delayed until the actual damage occurs," they said in a joint statement.

Last year, more than 900 million kilograms of CFCs were produced worldwide. Barbara Blum, deputy administrator of the U.S. Environmental Protection Agency, announced at the two-day Oslo conference that the U.S., which already banned CFC use in aerosol propellants, is proposing limiting the amount of CFCs it produces to 1979 levels—about 250 million kilos a year. She noted with satisfaction that Sweden has also banned their use in aerosol propellants and that a similar ban will take effect in Canada this May and in Norway July 1, 1981. The nine EEC countries recently endorsed a 30 percent reduction from the 1976 level to be reached by June of next year.

"The result of our Oslo meeting assures that international progress towards protecting the ozone layer by controlling CFCs will continue. And it must. Action by the U.S. or any other single country will never eliminate the CFC problem. Rapid, parallel actions by all CFC-producing nations are needed soon," Ms. Blum stressed. In addition, producer nations hope to involve non-producers and gain their cooperation.

The other producing nations present (Canada, Denmark, Norway, Sweden, The Netherlands, West Germany and the EEC Commission) welcomed the U.S. initiative and agreed to consider taking similar steps.

SPECIAL TO WER

Air Quality...

THE WORLD BANK is lending Brazil \$58 million to help finance the first major effort to reduce pollution in the greater Sao Paulo area. The bank believes this is the first concerted program in Latin America to control industrial pollution in a major metropolitan area.

Sao Paulo is Brazil's major industrial city and its growth has been paralleled by an increase in pollution so great that in the most populated and industrialized areas the quantity of pollutants far exceeds the natural, self-cleansing

capacity of the environment.

The project, with a total cost of \$187 million, is aimed at improving air quality in the greater Sao Paulo area and at reducing the discharge of toxic substances and organic materials into bodies of water.

THE CHILEAN GOVERNMENT (Ministries of Health, Transport and Communications) has banned the import of vehicles with two-stroke engines unless they are equipped with antipollution devices. The decision, taken in late March, was effective immediately. Those vehicles already imported with relatively high-polluting engines have until the end of 1980 to attach the anti-smog devices.

AIR POLLUTION IN INDONESIA will reach a higher level due to the increasing density of population, the expanding sources of contamination and the decreasing vegetation in the country's urban areas, according to a report published by the Indonesian Office of the State Minister for Development and Environment Supervision. The high level of pollution can be seen from the emergence of smoke in various towns, the layers of dust covering roofs around industrial areas and emissions along a number of main roads.

A NUMBER OF TEACHERS in Lalbaug, in central Bombay, India, are suffering from TB and other chest diseases, making it difficult to ensure regular attendance.

The Municipal Education Committee has proposed a cash allowance for them and even suggested that they be compulsorily sent on leave to obtain medical check-ups and treatment

Lalbaug and the adjoining area of Parel have a large number of textile mills which contribute to alarming levels of air pollution.

Wildlife...

HONG KONG'S DIMINISHING WILDLIFE population will be protected by a government decision to prohibit game hunting. Annual game licenses will no longer be issued or renewed. An Agriculture and Fisheries Department spokesman said the decision was also made in the interest of public safety due to the growing number of people visiting the countryside.

Wildlife has been increasingly harmed by urbanization and hill fires. The spokesman said fewer habitats for wild animals are left to develop naturally—such as the mangrove swamps in Deep Bay, which have been reclaimed into fish ponds. The construction of reservoirs and the conversion of villages into towns are also changes which have influenced the availability of suitable habitats for different species of wildlife.

CHINA has introduced a series of conservation measures to protect wildlife living in the Changbai Mountains in the northeast Jilin Province. The 210,000 hectare zone in the Changbai Mountains is one of the largest natural reserves in China. Among the animals living in the area are the Manchurian tiger, sables, otters, lynxes, squirrels, leopards, yellow weasels and various species of birds. Hunting, tree felling, land reclamation and the collection of medicinal herbs are prohibited in the area.

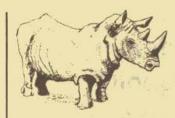
DETERGENT-TREATED PENGUINS rescued from oilslicks used to have only a slim chance of survival. Now their survival rate is improving—mostly because their release to the sea is held back until their natural oils are in full production.

Of 69 rare jackass penquins released after cleaning and convalescence in Cape Town, South Africa, 25 were reported safely back on the St. Croix Island penguin sanctuary (900 kilometers away) 13 days later. They were seen shedding their oil-damaged feathers.

MEASURES TO CONTROL GREY SEALS have been called for by Irish fishermen accused of killing numbers of the seals late last year on the Mayo coast.

Two major Irish fishermen's associations want to talk with the Department of Fisheries, Department of Wildlife and the Irish Wildlife Federation about damage done to salmon stocks by the seals.

The fishermen say that to avoid problems in the future there should be a careful examination of and implementation of suitable control measures.



Tanzania's rhinos are in danger of extinction

DAR ES SALAAM—Tanzania has established a Rhino Conservation Task Force as the latest move in its stepped-up campaign to save this endangered species. The Task Force will map out short and long term recommendations to protect Tanzania's remaining rhinos.

Until only a few years ago rhinos were plentiful in Tanzania's vast game parks and reserves; today they are close to being poached out of existence. For instance, in 1966 the rhino population in Ngorongoro Crater was put at 356, six months ago it was less than 50, and today Tanzanian authorities say there are almost none left.

As Tanzania's Minister for Natural Resources and Tourism Solomon Ole Saibull frankly told a group of tourists recently, "Don't be surprised if you don't see rhinos during your tour because their numbers have been cut down by poachers."

What Saibull terms "a feverish pursuit of the rhino" began several years ago when the world price of rhino horns skyrocketed from \$45 to over \$300 per kilo. Rhino horns are ground into a powder and used as an aphrodisiac in Asia.

During the past year Tanzania has taken a series of emergency measures to save the rhino. Last March rhino hunting was banned, although hunting for other wild animals is permitted under strictly regulated conditions. Tanzania and Kenya, despite the fact that their common border is officially closed, have agreed to cooperate in anti-poaching activities.

In addition, Tanzania is beefing up its own anti-poaching squad with the help of a \$400,000 loan from the World Bank. The squad has purchased additional vehicles and equipment and has expanded its size to over 300 people by recruiting 100 ex-soldiers who fought in the war against Idi Amin in Uganda.

A rhino breeding station has also been established near Mt. Kilimanjaro through a grant from the Frankfurt Zoological Society.

Finally, game scouts have been told not to reveal the location of rhinos still in the parks—even to tourists. Tanzanian wildlife officials are cautiously optimistic that with this combination of measures, the rhino may yet be saved.

MARTHA HONEY

More meat can be grown in an estuary than on a pasture

DURBAN—The world's lushest pastures can produce about half a ton of meat per hectare a year. But a hectare of estuary can produce 45 tons of oyster meat.

That is what Dr. Alan Heydorn, until recently head of the Oceanographic Research Institute in Durban, South Africa, asserted at a recent conference.

He saw mussels as having even greater potential for countries with cultivable estuaries. A suitable estuary could produce 240 tons to the hectare, he said.

Dr. Patrick Berry, principal research officer of the institute, has been experimenting with mussel production in Natal and gives a potential yield as being 7.5 million mussels a hectare a year.

South Africa's coastline is geographically unsuitable for a mass cultivation, but many estuaries around the world could produce enormous quantities if the young shellfish could be nurtured over their critical stage.

"It is an engineering problem rather than a biological one," says Berry. He is now working on making flat-topped, artificial reefs that would be just below water level at spring low tide.

JAMES CLARKE

(Information: Dr. P. Berry, Oceanographic Research Institute, Marine Parade, Durban 4001, South Africa).

Egypt is easing its eco-laws so that industry will comply

CAIRO—On the face of it, it doesn't make sense. To protect precious water resources from industrial pollution, Egyptian planners and scientists are trying to loosen, rather than tighten, the provisions of their country's environmental legislation.

The current laws, written in the early 1960s at the start of an intense period of industrialization, are simply too strict. Given the availability of treatment facilities for liquid and solid industrial waste, says Dr. Amin El-Gamal, an undersecretary in the Ministry of Health, "the standards are unattainable and so they are ignored."

In one instance, according to current legislation, water drawn from the Nile River and used in industry must be purer, in terms of the amount of oxygen present, when it is returned to the river as waste water than when it was taken out in the first place.

Egyptian officials cite a chemical factory in Upper Egypt that has been provided with pollution control equipment from a western country. But it isn't used, they say, because it does not meet the requirements of the law.

The new legislation, now being drafted at the Ministry of Health, is expected to establish more realistic standards that will encourage, rather than discourage, compliance and enforcement. In the opinion of one western specialist working in Egypt, reasonable environmental legislation could help achieve purity of the Nile in ten years.

Another project, which complements the re-writing of the legislation, would provide Egyptian industries with machinery for pollution monitoring and treatment. A \$16 million grant from the U.S. Agency for International Development will help finance the selection and purchase of equipment and will train factory personnel in its operation.

NATHANIEL HARRISON

Environmental legislation . . .

THE GAMBIA, West Africa, has banned the use of charcoal, as of July, to reduce (or perhaps stop) the destruction of its remaining forest resources.

Prime Minister Sir Dawda Jawara defended his Government's action—widely criticized since charcoal is the main cooking fuel for most Gambians—because if action is not taken quickly, there will be no forest left.

However, Gambian critics say there are few other fuels available: gas is expensive, few poor people have electricity, and firewood supplies are limited. Sir Dawda says his plan is to bring down the cost of bottled gas by establishing a bottling plant in the Gambia.

KENYA HAS BANNED SMOKING in all public places. Kenya had taken no previous measures against smoking; cigarettes are freely advertised and cigarette packs do not have to carry a health warning.

The ban is imposed under Kenya's public health law, and covers restaurants, theaters and elevators.

THE JAPANESE GOVERNMENT recently approved the outline of a bill requiring developers to make environmental impact assessments prior to the commencement of large-scale development and construction projects. The types of pollution to be considered include air pollution, water contamination, noise, vibration, land submergence and foul odors. Under the bill, the governor of a prefecture will make public an environmental impact assessment report and hold public hearings. Third-party experts are excluded from participation in public hearings.

INDIA'S INDUSTRY MINISTER, Dr. Charnajit Chanana, told Parliament recently that the Industries Act of 1951 (covering development and regulation) might be amended to incorporate pollution control measures in the licensing process for new industrial plants.

"The anti-pollution measures taken should be according to the standards prevailing in the state in which the factory is located," he said.

He told the Parliamentarians that a bill with this anti-pollution amendment would probably be introduced during their next session.

TRAWLING IN VENEZUELA will be limited to a certain number of months a year and be subject to strict controls in order to protect marine species in Venezuelan seas.

The new Environment Ministry regulation divides the coastal and island waters into nine zones according to depth and marine life.

On the Subcontinent...

LEADING INDIAN ENVIRONMENTALISTS have asked Prime Minister Indira Gandhi to set up a central environmental agency to direct, organize and coordinate various conservation activities.

The proposed agency would coordinate the efforts of as many as 16 different departments which now handle conservation problems in India.

Everyone agreed at an informal meeting with the Prime Minister that environmental problems should be tackled in a methodical manner. And all the environmentalists suggested that the central environmental agency should be under the direct charge of the Prime Minister, who has often expressed concern at India's ecological and environmental deterioration.

TO IMPROVE INDIA'S NATURAL DISASTER warning system, 110 weather monitoring stations will be set up in remote and inaccessible areas and linked through a geo-stationary satellite with a data utilization center in Delhi.

J.B. Patnaik, India's Minister for Tourism and Civil Aviation, said India hopes to save thousands of lives lost every year due to natural calamities.

"GOBAR" GAS UNITS, which produce methane gas from animal dung, are becoming increasingly popular in India and are being considered in Pakistan.

India has 70,000 units producing "gobar" gas for cooking, lighting and to power generators and engines. Recently, the State Bank of India provided a \$1.9 million loan for training local people in the construction of these small units.

A report prepared for Pakistan's state-owned Water and Power Development Authority said that nation has the potential for producing 4.7 million cubic meters of "gobar" gas a day if only 50 percent of the cattle dung available were collected. The report said this would replace annual imports of 6.3 million barrels of petroleum costing \$80 million. The report needs "a lot of further studies," the power authority said.

The technology, in wide use throughout China and other Asian nations, is simple, relatively low-cost and pollution-free.

A STUDY OF INDIA'S fossil fuel potential has been conducted by Romanian oil experts. The conclusion is that plenty of oil and gas occurs all along the Himalayan ranges bordering Nepal. These experts have conducted the exhaustive study of possible oil bearing structures in this extensive area over the last two decades.

India lacks funds to tackle its growing erosion problems

NEW DELHI—Agriculture Minister Rao Birendra Singh says that about 160 million hectares of India are becoming eroded—an area nearly the size of Washington state—but because of a lack of funds the problem could not be tackled on a war footing as a leading forester had advised (WER, April 7, p. 6).

"The real need," he told Parliament, "is a mass awakening. Unless people are conscious of the damage due to deforestation, the indiscriminate felling of trees and the employment practices of greedy contractors, this problem cannot be tackled by government measures alone."

The Minister said that \$826 million was being spent this year on soil conservation.

Floods, which affect about 8 million hectares of land, cause an annual loss of \$312.5 million dollars. According to a report by the National Commission on Agriculture, out of a total geographical area of 328 million hectares, about 150 million hectares are seriously affected by wind erosion. In addition, an estimated area of 9.6 million hectares is subjected to erosion due to shifting cultivation.

According to one study, the average rate of sedimentation in reservoirs is many times higher than the rate assumed when they were designed and built. This had reduced the effective life span of the reservoirs.

The Government of India is planning a new scheme of watershed management in the catchment areas of flood-prone rivers in the Indo-Gangetic basin with an outlay of approximately \$11 million.

A number of other projects have been drawn up to check soil erosion: integrated soil, water, and tree conservation in the Himalayas; reclamation of akaline and acid soil; the control of shifting cultivation; protecting table lands and stabilizing ravine areas; and social (village) forestry projects.

R. MURALI MANOHAR

Pakistan plans to have a solar-powered future

ISLAMABAD—Pakistan will spend \$1 billion during the current fiscal year on oil imports. That is half of its total foreign exchange earnings. By the end of the century, Pakistan's estimated energy consumption will rise 20 times. In view of this, many experts, including the Pakistani Nobel Prize Laureate, Professor Salam, have stressed the need for solar energy.

Two solar-power projects, a lighthouse off Port Mohammad-Bin Qasim and a small power station at Khadeji, some 40 kilometers north of Karachi, were commissioned recently.

With \$1 million from the United Nations, four solar energy centers are being set up in villages around the country. Others are planned if these demonstration centers are successful.

Experts hope the program can be extended to remote villages hitherto without electricity. In the past 32 years since independence, only 6,000 out of 46,000 villages have been electrified. If the current pace of rural electrification is maintained, nearly two centuries would be required to electrify these villages, and it would entail a colossal cost, retarding the development process.

Villages without electricity, representing about 70 percent of the country's population, either go dark at night or burn kerosene, which costs over \$30 million in subsidies every year.

Pakistan has a large conventional power resource potential hydro-power, gas, oil and low-grade coal—but their exploitation requires huge sums.

MOHAMMAD AFTAB

Manila's ecologically awful water & sewage lines improved

MANILA—The Philippine government has announced moves to give a major boost to Metropolitan Manila's antiquated water and sewage systems. The project is formidable: at present 75 percent of Metropolitan Manila's eight million people do not have piped water and 90 percent of its homes are not connected to sewers.

The government has already begun work on a \$40 million water improvement scheme. The supervising body, the Metro Manila Commission, estimates the city's daily water needs to be 400 million gallons. But at full capacity the water supply is 50 million gallons less than that.

More than 30 percent of the city's water is lost because of leaky pipes. In many areas pressure is so low that the water flows through the pipes only at night. Communal pipes, servicing a dozen or more homes, are common.

One of the problems is that in the more affluent suburbs the people install illegal pumps on water mains or bribe officials to illegally tap common water pipes. In many "dry" areas the only water comes from private pumps or it is bought in drums from vendors with push carts. The Metropolitan Waterworks and Sewerage System estimates that 40 percent of the city's water supply comes from "independent sources" and goes unbilled. It has offered a 20 percent discount on the water bills of people who inform them of illegal water connections in their neighborhood.

The sewage system is worse. The pipes were laid at the start of the century to serve 350,000 people. The city's population now is 20 times that number. There have been improvements over the years but these have been piecemeal and uncoordinated.

The plan now is to raise a \$60 million loan from the World Bank to lay down an integrated sewage system incorporating proper treatment and disposal of wastes. At present, with only 10 percent of Manila connected to the system, most people make do with makeshift septic tanks or channel their waste into open flood drains. The raw sewage is dumped just a few hundred meters out into Manila Bay posing a major health hazard and polluting the environment.

Water Quality ...

BY 1985, CHILE, with help from the World Bank, will have extended its water supply system to cover 99 percent of all homes in the capital city, Santiago. The nearly \$120 million project will also improve the environmental and health conditions of the country's urban population—1.8 million—in 36 cities outside Santiago by providing safer water more efficiently.

Most of the 686,000 beneficiaries in Santiago are slum dwellers and more than half of them have a per capita income less than one-third of the country's average income. About 70 percent of the total urban population served by the national sanitation network will benefit from safer water, lower water wastage and reduced costs because the project is being tackled on a nationwide level. It also provides a sewerage master plan to cover Santiago's needs to the year 2000.

THE SOUTH KOREAN GOVERNMENT plans to switch from the use of hard detergents to biodegradable types beginning in August. The Ministry of Health and Social Affairs has instructed companies producing hard detergents to discontinue making them starting in July. The government's decision was motivated by the high pollution levels of the rivers in the country, which far exceed the permissible level of 0.5 ppm (part per million) recommended by the World Health Organization.

CHINA IS STEPPING UP its efforts to combat industrial pollution. A nonferrous-metals plant in Hubei province was recently fined the huge (for China) amount of \$1.3 million for dumping its waste into an adjoining lake that drains into the Yangtze River in east-central China. The plant is one of 167 industrial and mining enterprises warned by the government in 1978 to solve serious pollution problems or face punishment, including closure.

AN ALARMING RISE in the pollution level of the Tachin River, which runs through the western part of the Central Region of Thailand, has led to implementing a joint three-year project between the National Environment Board and the Thailand Institute of Scientific and Technological Research.

Waste from more than 400 factories situated along the river's banks is creating a rapidly growing pollution problem. The multi-disciplinary study, started November 6, 1979, is aimed at preventing the destruction of this important waterway's fertile fishing areas and the pollution of surrounding agricultural land through irrigation water.

The final results and recommendations of the study will be used as a basis for a blueprint of an integrated plan for water quality management of the Tachin River.

Down Under...

KEN PIDDINGTON, who became New Zealand's Commissioner for the Environment in mid-April has been closely associated with environmental planning as director of the New Zealand Planning Council. He was the first deputy director of the South Pacific Bureau for Economic Cooperation in 1972 following the establishment of the South Pacific Forum the previous year, and was seconded from the bureau to a task force on economic and social planning. The Commissioner for the Environment in New Zealand has a role that influences the interaction of Government and environmental agencies.

A 1,000-KILOWATT SOLAR-POWERED electricity plant will be built near Ayers Rock, about 1,491 kilometers south of Darwin in Central Australia. The \$10.8 million plant, to be constructed jointly by McDonnell Douglas and a Sydney engineering company, will provide electricity for the nearby tourist village of Yulara and 25 small communities.

AUSTRALIA, the world's driest continent has plenty of inland water, but its salt content makes it unpotable.

Now, three new water treatment processes, which resulted from a unique government/private industry collaboration, will be put to the test in an evaluation scheme run under the auspices of the newly created National Water Treatment Systems Center.

A consortium called AUSTEP will demonstrate the three processes developed by the Commonwealth Scientific and Industrial Research Organization and a number of industrial research units, including ICI Australia Ltd., Australian Mineral Development Laboratories and Davy Pacific Proprietary Limited.

AUSTEP will start its program in Western Australia, the driest state, where the population is undergoing its fourth successive year of drought.

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Vietnam vets' suits pressure Australian defoliant study

PERTH—Amidst increasing publicity and mounting pressure, Australia's federal government has decided to launch a \$2 million, two-year medical inquiry into the effects of the herbicide Agent Orange on Australia's veterans of the Vietnam war.

The vets claim that Agent Orange, a defoliant, caused physical disablement in some ex-servicemen and birth defects in some of their children (see WER, March 10, p.8).

The government study will ultimately involve 40,000 Vietnam veterans, 100,000 children and a control group of 20,000 soldiers who did not serve in Vietnam.

The decision to examine the veterans' allegations follows the filing of more than 200 claims with the Repatriation Commission regarding alleged Agent Orange-related health problems, although none of the claims has been officially admitted.

Defense Minister D.J. Killen, who had repeatedly denied that Agent Orange was used by Australian troops, finally did admit that the defoliant, a 50-50 mixture of herbicides 2,4-D and 2,4,5-T, was used by Australians in Vietnam. Mr. Killen also tabled in Federal Parliament two classified Defense Department reports, marked "confidential" and "restricted," which were reviews done in 1968 and 1970. One report said that Australian servicemen had been "medically affected" by herbicides.

The Prime Minister, Malcolm Fraser, who was defense minister for part of the war, has defended the use of herbicides during that conflict.

JANE NACZYNSKI-PHILLIPS

Oil from rocks—Australia's major fuel alternative

PERTH—The first really significant move towards development of alternate fuel in Australia has been made with the start-up of research and engineering studies for the Rundle oil shale project (WER, Jan. 28, p.8).

Esso Australia Ltd. has been chosen by Rundle "twin" developers Southern Pacific Petroleum and Central Pacific Minerals as the joint venture partner in the project. Esso can earn up to 50 percent equity in the project in which 2.3 billion barrels of oil could be extracted from shale near Gladstone, Queensland.

A pilot plant is to be built within the next four years and could initially produce 20,000 barrels of oil per day, rising eventually to 200,000 barrels per day. At that stage it could replace as much as 70 percent of the country's present imports of crude oil, now costing \$1.9 billion per year.

Esso's bid beat out other tenders of participation in the project: one, a Japanese consortium, the other Australian. Esso, in partnership with Australia's Broken Hill Proprietary Co., Ltd. (a loser in the Rundle bid), owns the big Bass Strait oilfields and they jointly and separately run extensive petroleum exploration programs in Australia.

JANE NACZYNSKI-PHILLIPS

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The state of our global state from air to the arms race

NAIROBI—The annual State of the Environment Report—presented to the United Nations Environment Program (UNEP) Governing Council here April 16 by Executive Director Mostafa K. Tolba—focuses attention this year on the issues of carbon dioxide and climate, heavy metal hazards, transport and the environment, the environmental effects of military activity, and the child and the environment.

These topics, Dr. Tolba said, are important contemporary issues. Carbon dioxide represents a global pollution problem that is not yet upon us (and may yet prove to be illusory). But the other topics are more tangible. "Taken together," he said, "these five topics illustrate today's human and environmental dilemmas."

The carbon dioxide problem arises because man has significantly modified the rate at which carbon is returned to the atmosphere from fossil fuels and from the forests. "The crucial questions concern the scale of this modification, its consequences, and the likely trends in future," he said.

The main need at present is for better scientific information and understanding leading to better forecasts and perhaps to early warning systems. The carbon dioxide question cannot be considered in isolation from other natural and man-made causes of atmospheric change.

Dr. Tolba noted there is a growing consensus that increasing atmospheric carbon dioxide will produce a global warming (the "greenhouse effect") in the next century. But there are still very large scientific uncertainties. While research proceeds, he warned, the world should give further thought to how it could adapt to such possible climatic changes. "Alternative energy strategies (including energy conservation) and ways of avoiding forest and soil destruction need urgent consideration," he stated.

Turning to heavy metals, Dr. Tolba said cadmium, mercury, lead and other substances are fundamental to major industries, yet they have the potential to damage human health and disturb the environmental balance.

While more information is still needed about the sources, pathways, and impacts of these metals, international action is also needed to protect areas of shared resources—such as the Mediterranean and other regional seas, or major continental rivers. There is a natural overlap between international actions related to metals and actions to safeguard the areas of the environment which they pollute," commented Dr. Tolba.

Environmental management ...

ANOTHER LAW OF THE SEA session just ended its continuing negotiations, this time at the U.N. in New York, and sunlight can be seen through what has often been foggy going for the past seven-plus years.

The environmental areas have mostly been agreed upon (WER will have more on this in an upcoming issue). This session agreed to create a Seabed Authority under the convention for deep sea mining beyond the areas of national jurisdiction. The legal and technical commission of this authority has an environmental responsibility, to monitor the deep seabed areas and to assess the environmental regulations necessary for deep sea mining.

A new amendment to tighten the conservation laws on whaling was also agreed upon.

The Law of the Sea Conference reconvenes in Geneva on July 28, and it is expected that a draft treaty will be completed then. However, it is unlikely that the treaty will be approved this year.

POPE JOHN PAUL II has proclaimed St. Francis of Assisi the patron saint of ecology.

The declaration said St. Francis was chosen because "he considered nature as a marvelous gift from God to humanity."

THE EUROPEAN COMMUNITY (EC) has outlined its priority environmental tasks for 1980, saying it will focus on water and chemical pollution and on industrial accidents.

The Commission's work on chemical pollution will focus on talks with American authorities on harmonizing TOSCA legislation, as well as on drawing up tighter EC legislation on chlorofluocarbons than already exists.

The Commission plans to submit proposals for directives on noise abatement, particularly in industry.

It hopes to submit three proposals on waste—encouraging the re-use of "secondary raw materials," in packaging for beverages and on regulating the burning of waste oils.

On air pollution, only a simple improvement in the exchange-of-information agreement among member states on monitoring levels of sulphur dioxide and suspended particles pollution is up for consideration.

THE FIRST LADY of the Philippines and its Human Settlements Minister Imelda Marcos has appointed Dr. Celso R. Roque, executive director of the National Environmental Protection Council, president of the Environmental Center of the Philippines Foundation. Roque is to hold both posts concurrently. He has set himself the task of raising funds from international institututions to strengthen the organizations' finances.

Dealing with the environmental aspects of transport, Dr. Tolba said substantial energy savings can be made by improving engineering, by improving load factors, and by switching traffic to more efficient modes. Transport also brings problems of pollution and noise.

The central problem with transport is how to strike a balance, but (unlike the carbon dioxide and heavy metals problems) here the environmental effects are relatively well understood. Within the next 50 years, oil supplies may diminish, and alternative fuels will have to be found—some people think that hydrogen may become the new aircraft fuel.

What is clear, Dr. Tolba stated, is that the future of transport and energy are inseparable.

Since the Second World War ended in 1945, some 130 civil and regional wars have taken place; at least 12 of these caused considerable environmental damage. The growing volume and destructive power of the world's weapon stocks pose an obvious risk to man and his environment, he warned. "Development can hardly proceed at the required pace, and a healthy environment cannot be guaranteed, amidst a widening and constantly escalating arms race.

"One of the more urgent tasks, therefore, is to arrest the technological spiral at the center of the international arms race and, through substantial and substantive disarmament measures, to pave the way for major reductions in world military expenditures."

Turning to his final topic, Dr. Tolba noted that children are more vulnerable than adults to pollutants and environmental stresses—and standards for environmental quality need to be set with children very much in mind.

Children make up half the population of many slums and shanty towns, and slum populations are increasing three or four times faster than the populations of the more modern parts of cities. The problem is not one of scientific uncertainty, but of resources.

Given wholehearted national endeavors and international cooperation, it should be possible by the year 2000 to (a) halve infant mortality, (b) raise life expectancy in developing countries from 56 to at least 65, (c) ensure better health and education, water supplies and sanitation for all children, and (d) ensure that fertility is regulated at a reasonable level.

CHARLES HARRISON

Desert funding is drying up and lands are deteriorating

NAIROBI—Governments of countries faced with desertification are giving insufficient priority to this problem. At the same time there is a need to strengthen cooperation within the UN system to ensure effective pooling of efforts and resources.

These comments are from a report prepared for the United Nations Environment Program Governing Council meeting in Nairobi April 16-29. It says also that it is still necessary to fill gaps in available knowledge, and to pass on existing knowledge to people who can use it.

Lack of finance also remains a serious problem, says UNEP Executive Director Mostafa K. Tolba, and it is "seriously limiting" the efforts of the UN system to implement the 1977 Plan of Action. In 1977 it was estimated that about \$400 million a year was needed to halt deterioration of lands. But funds of this magnitude have not yet been made available. "National and international efforts need to be intensified, and additional resources need to be made available," Tolba stated.

In Nairobi this March, 27 African and Latin American projects—each with a distinct anti-desertification component—were put to members of the Consultative Group for Desertification Control (DESCON). DESCON, containing potential donors like the USA, West Germany, France, Italy, Belgium, Holland and the World Bank, was set up after the 1977 Nairobi conference. This was the second meeting of the 40-member group.

Dr. Tolba said he considered the meeting a "positive" one. Although no definite financial commitments emerged, the members identified those projects for which they were prepared to provide finance, experts, technical assistance or equipment.

Projects which attracted positive interest, a UNEP spokesman said, included a sand-dune fixation project in Libya; an irrigation and land settlement project on the Tana River in Kenya; and livestock development on the flood plain of the Niger River in Mali.

All the projects put to the Nairobi meeting were "one country" projects. Dr. Tolba said it was decided to concentrate on these, as they did not involve the problems that have been encountered in launching multinational projects like the North African green belt, which involves several countries.

CHARLES HARRISON

A widow's rubbish recycling sparks government interest

JOHANNESBURG—A South African widow's home-grown recycling operation has done so well that local municipalities are wondering if they too should start recycling their refuse dumps.

No local authority in South Africa has a municipal recycling depot of any importance and the potential value of glass, metal and plastic dumped annually is \$64 million.

Mrs. Marie van Deventer, mother of three, employs 50 other women, nearly all black, from 7 a.m. to 4 p.m. to scour the town of Alberton's dump. She pays a token fee to the municipality for "rights" on the dump.

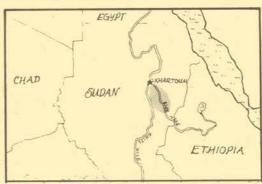
Her husband, who worked for the town health department before he died a year ago, started the scheme in 1977.

With bare hands the women dig in the rubbish sorting out glass, whole bottles, plastic, stainless steel, scrap metal, cans, tires, cardboard and newspaper. Even the bags they use are salvaged from the dump. The materials are sold to recycling plants, and the workers are paid by Mrs. Deventer according to what they collect. The average earnings are about \$31 a week.

The operation relieves Alberton of 75 percent of its rubbish.

JAMES CLARKE

In Africa ...



THE SUDANESE government and the World Health Organization are mounting a concerted attack on health problems—mainly bilharzia, malaria and diarrheal diseases—transmitted via irrigation systems along the Sudan's Blue Nile.

A multi-faceted plan—incorporating biological, engineering and chemical measures—is, for the first time, being effected on such a large scale. It is designed to tackle all the area's health problems comprehensively, and it represents a major shift away from a project-by-project approach. Two million farmers and 500,000 seasonal workers are in the 850,000 hectare area to be treated.

The program will run for 10 years and have an estimated budget of \$155 million, 60 percent from the Sudan, 40 percent from outside donors.

WHO officials said control methods will be effective against more than one disease, will be long-lasting, and will be safe for man and his environment.

PRODUCING ETHANOL to extend petrol and diesel supplies could become a sociological problem for people in rural South Africa, warns the Energy Research Institute of the University of Cape Town.

While advocating it as useful not only for fuel but for providing work in rural areas, the institute warns it is a drinkable alcohol.

KENYA has been experiencing its worst electric power shortage in years. Industries and domestic consumers have had to accept regular power cuts, and residents of Nairobi and other areas have no electricity for water heating.

Julius Gecau, chairman of the local power company, said low rainfall had reduced the water level in reservoirs serving the hydroelectric stations which produce most of Kenya's power supply. Until the dams fill up (hopefully in April), power cuts will continue.

An additional factor is that the depth of water in the dams is being steadily reduced by a build-up of silt washed into Kenya's rivers. Poor farming practices, including cultivation on river banks allowing topsoil to be washed into the rivers, is blamed for this situation.

Water wise...

A STUDY OF THE POSSIBLE ENVIRONMENTAL effects of the Mexican Ixtoc-1 oil spill was to begin mid-April along the American Gulf Shore.

The Southwest Research Institute of San Antonio, Texas, said it would fund the \$66,000 study as a public service. The program was developed with the cooperation of state universities and federal agencies that have worked on the problem.

Gas chromatography-mass spectroscopy instrumentaiton will make it possible to distinguish lxtoc-1 petroleum from that which results from natural oil seeps in the Gulf.

THE ISLAND OF ALDABRA, a nature reserve in the Indian Ocean 286 kilometers north-west of Madagascar, is regarded as one of the most scientifically interesting atolls in the world. The dominant life form is the giant tortoise—150,000 of them—plus several species of rare plants and birds. The rich marine life remains intact after many years of research by international scientists.

The island had been leased by the Royal Society, but just this Spring was handed over to the Seychelles Islands Foundation, which was set up last year to continue the work which had been done there. There is a fully-equipped research station on the island.

CHINA IS OPERATING its first water quality testing vessel on the Yangtze River between Shanghai and Chongqing (Chungking). The 500-ton ship is equipped with laboratories, and the instruments on board can automatically record the presence of pollutants, calculate their quantity, trace their origin and analyze their radioactive and biological properties. The scientific data will be used for pollution research of the 6,300 kilometer Yangtze River.

OVER \$60 MILLION DOLLARS have been allocated for reducing pollution in India's Jamuna River, which runs through the capital city, Delhi.

The Chief Councillor, Kedar Nath Sahani, told WER, "Things will improve by 85 to 90 percent after fifteen months." He said there are short-term and long-term projects in the \$60 million scheme to improve sewage and drainage in the city. Of this, over \$17 million will be used to prevent sewage discharge into the river. About 30 million gallons flow into the river every day through four major drains. Now all these are being blocked.

The discharge will be trapped in the sewers and taken to treatment plants or treated in oxidation ponds.

A part of the waste water that is being stopped or trapped would be used for irrigation purposes.



Botswana's diamond diversion could damage its environment

JOHANNESBURG—Lake Ngami in Botswana is one of the world's few pristine places. Man and abundant wildlife, plus a few cattle, live in a fine state of balance.

Its fishlife provides the local people with abundant protein, and the hunting of wildlife is done in the time-honored way of Africa before the white man came—conservatively.

The 800 square kilometer lake appeared on no map until a century ago. There are still no respectable roads leading to it. It is found at the south-west extremity of the world's largest inland delta—the 16,000 sq. km. Okavango Swamp which itself is an unspoiled wilderness of very shallow but crystal clear water, with plant and wildlife, set in the surrounding Kalahari desert.

Well to the south-east of Lake Ngami is a diamond mine at Orapa, an arid zone which is bringing in new wealth for Botswana. The Anglo American Corporation, which owns the mine, wants to divert some of the water that feeds Lake Ngami so the mine can be assured of water. That would lower the level of the lake.

Even a drop of a few millimeters would mean the lake shore would recede over an area of scores of square kilometers. The annual surges of water would no longer flood the natural pastures, thus reducing their carrying capacity.

Nobody has researched the short, medium or long term implications of the plan. One suspected impact would be that the Ngami people would be forced to retreat north and thus encroach on those wetlands which Botswana wants to preserve against human and especially cattle pressures.

The Botswana government is in a quandary. It needs the diamond mine but it also needs to maintain the status quo of its lakeland which brings more than \$1 million annually from tourists and hunters, who are the economic life-blood of the local people.

As Botswana's vice-president Dr. O.K.J. Masire said: "Handling the Okavango makes us nervous; it is like a doctor treating his own child."

And so he has called upon Rhodes **O**d Cape Town Universities in South Africa to research the problem. A preliminary expedition is to be mounted in May, and an appeal is being made to commerce to finance it.

First, they have to determine the nature of human interaction with the lake and thereafter answer the question: to what extent would Lake Ngami with its people and biota be affected by the diversion of water from its source river? Then they will make firm recommendations for the efficient utilization of the lake environment in the long term.

JAMES CLARKE

Thai birds are in danger; there's no place to live

BANGKOK—Destruction of natural habitats and the use of insecticides are endangering some 850 species of birds in Thailand, particularly water birds, according to top Thai conservationist Dr. Boonsong Lekagul, who is secretary-general of the Association for the Conservation of Wildlife.

Dr. Boonsong is concerned that the destruction of Thailand's forests has already left some 400 species of birds without their natural feeding grounds, while a further 100 species of water birds have had their habitat destroyed with a filling up, or converting to rice fields, of marshes.

Furthermore, the role played by birds in insect control has been affected. According to Dr. Boonsong, insecticide has made many insects poisonous. As the number of birds diminishes, the insect population is increasing; consequently the use of insecticide is growing.

To halt this process, it would be necessary to completely end forest and swamp destruction and to create more natural areas for birds. At the same time, the Royal Forestry Department should be given more money and power to enable more national reserves and game sanctuaries to be set up, Dr. Boonsong said.

"The Government must ratify the Convention on the International Trade of Endangered Species of Flora and Fauna, because Thailand has many illegal traders in animals. The Captive Breeding Law must also be revised, while much wider efforts must be made to educate the public in conservation and how forests and birds are useful to mankind," he added.

TONY OLIVER

South Korea's environment office announces its program

SEOUL—The newly established South Korea Office of Environment has announced a series of anti-pollution programs.

It will provide financial support totalling 26 billion won (\$44.8 million) to industries for the installation of anti-pollution facilities.

To prevent air pollution, the office is to survey 12,386 firms and more than 200,000 vehicles to check on their emissions; 12 automatic and 73 semiautomatic air pollution checking devices will be installed throughout the country for this purpose. The office will use the data from the survey to establish more efficient antipollution measures.

The office also plans to conduct a survey on the discharge of polluted waste water from 80 livestock farming complexes and 2,490 industrial firms.

Furthermore, it will enact a standard law for solid waste disposal and consider the use of solid waste as resources. It will also establish the Korean Resources Recycling Corp.

The environment office plans to train 320 environment officials and 1,500 pollution control managers of industrial firms with the help of the Environment Preservation Association. And it will step up its cooperation with international organizations.

SPECIAL TO WER

Wildlife...

ELECTRIC PYLONS striding across the South African veld are both good news and bad news for this region's rarest bird—the Cape or griffon vulture (Gypo coprotheres).

The good news is that they give the vultures now down to their last 5,000—somewhere to roost during scavenging expeditions across the otherwise treeless savannahs.

The bad news is the Electricity Supply Commission (ESCOM) until recently shot any vultures seen on pylons because their exreta caked the insulators and, in wet weather, caused flashovers bringing whole industrial areas to a standstill. Another problem is that their wings would touch a cable resulting in a roasted bird and a blacked-out town or factory.

The Endangered Wildlife Trust's vulture study group approached Escom, and a solution was found. Escom now fits a 6-meter-long girder across the top of its pylons. This gives the heavy birds plenty of room, and it ensures that their droppings fall clear of the insulators.



SOME SAY THE RAREST BIRD in the world lives on the tiny island of Mauritius in the Indian Ocean. It is the Mangeur de Poules or Mauritian Crecerelle or again Falco Punctatus.

A pair of these birds was captured and successfully reared in captivity. In 1975 they produced the first Mangeur de Poules ever born in captivity, but fifteen days later it died. Renewed efforts in 1976 and 1977 were unsuccessful, and in early 1978, the birds died. In 1978, five more were captured and kept in an enclosure especially built to rear them under the best possible conditions.

And at last, in February 1979, a baby Mangeur de Poules was born which grew uneventfully up to January this year. All those who had been working hard on this experiment thought they had finally succeeded.

Then quite unexpectedly, early this year, the five birds and their chick died of some mysterious illness.

Now it is believed that only four of these birds are left in the world; they exist in the remote forests of Mauritius.

In Europe...

WITHIN A WEEK AFTER SWEDES approved a nuclear expansion program in a national referendum, the Swedish government authorized activation of the country's seventh and eighth

nuclear power plants.

That was the first concrete result of the vote held on March 23 which gave pro-nuclearists in round figures a 58 to 38 percent victory over opponents. A referendum is considered only advisory in Sweden, but all parties said they would consider the result binding. It implies improved safety precautions in the plants and more intense research and development of alternative energy sources less harmful to the environment.

The government and parliament now must follow through with a program laying down an energy policy for the rest of this century coupled with a maximum 12 nuclear power plants. Nuclear opponents wanted to put a stop to further building and phase out the six reactors now operating within 10 years.

The referendum also gave the government and parliament a broad mandate to hasten research and development of alternative energy sources based primarily on the sun, wind,

water and forests.

IN A WHITE PAPER on future energy production and consumption, the Norwegian Government said that oil-fired power and hydroelectric power will continue to be the nation's main energy supplies over the next 20 years. They currently account for 50 percent (oil) and 40 percent (hydro-electric) of energy sources used.

In the government's opinion, Norway's energy needs up to year 2000 can be met without

resorting to nuclear power.

Future plans include hydro-electric development of more than 50 watercourses. Despite conservation and protection plans for several watercourses, the Norwegian Society for the Conservation of Nature has already described the future plans as a "declaration of war against the interests of conservation of nature." The Society has promised a counter-report in April.

BERN, the Swiss capital, has dropped its Operation Free Bicycle, launched to fight pollution and thin traffic. Too many participants saw an opportunity to take the organizers for a free ride.

The organizers, an environmental group, had purchased 100 bicycles and made them available free for use within the city. That was one year ago. The hard facts revealed on March 12th: Of the 100 bikes, 22 have disappeared and dozens were damaged beyond repair. The finger has been pointed at juvenile vandalism.

However, Americans in Switzerland claim that in many U.S. cities the figures would have been used to prove a major success. After all, less than 25 percent of the bikes disappeared.

West Germany's eco-party, the Greens, changes hue—to Red

SAARBRUECKEN—The West German environmental movement—heralded as a key swing factor in the coming national elections—held a planning Congress here March 22-23 that caused most West German dailies to headline: "The Greens Turn Pink."

The Congress was convened to draw up a political program and platform for the election October 5. It was intended to unite the special interest fringe groups under an environmental umbrella and establish the party as a force on the national scene.

A recent election in Baden-Wuerttemberg put environmental party delegates into the state parliament for the first time. This success followed a similar election victory in the city-state of Bremen.

However, the Congress here saw the ideas of the basically conservative environmentalists defeated by an informal coalition of Maoists, Communists and other, smaller radical groupings. As the leftists rammed through pet projects, the Congress dealt less and less with environmental matters.

The policy that evolved called for unilateral disarmament by West Germany, an immediate start to dissolving the North Atlantic Treaty Organization and the Warsaw Pact, and immediate worldwide disarmament.

Various factions demanded sexual freedom and an end to mandatory schooling. This was followed by a debate on abortion, and on economic and labor policy, the idea being to split up large companies and turn them over to the workers.

Environmental matters hardly emerged, and the takeover, in the minds of many environmentalists, doomed the future of the party which had been hoping to attract centrists from the major German parties.

WILLIAM G. MAHONEY

Portugal's new government won on an eco-platform

LISBON—The recent national victory of the democratic alliance has brought fresh hope to Portuguese ecologists struggling with

growing environmental problems.

The center-right administration includes five deputies from the Popular Monarchist Party whose major platform was the environment. The alliance is dependent on the votes of the five deputies to maintain its slender three-seat majority. For the first time since democracy was restored to Portugal five years ago, the government's program touches on vital ecological questions. The program promises to safeguard historical zones, create more natural parks and enforce regulations and legislation over the use, manufacture, transport and storage of toxic products. It will also introduce an urgently needed general law of prevention and pollution control.

"The alliance has accepted our main ecological points" Monarchist deputy Luis Coimbra told WER. "The big petrochemical and oil refining complex at Sines, south of Lisbon, will be reviewed and the government's energy policy will emphasize conservation and wise use of available energy. As long as we are in the alliance, nuclear power will be shelved."

The environmentalists' presence in parliament has stirred up lively debates. Luis Coimbra has become the "parliamentary rebel" and rarely lets a legislative session go by without taking a

stand on some long-ignored environmental issue.

At the same time groups all over the country are starting to organize themselves. Thousands recently protested in front of a chemical plant. Youth groups are holding seminars on alternative energy, and newspapers are beginning to report ecological developments daily.

MARY MILLS

Acid rain not as damaging to forests as suspected

SANDEFJORD, Norway—Acid rain is causing major damage to lakes and rivers in Europe and North America, but so far it has caused no decrease in forest growth. This was one conclusion of a four-day international conference on the ecological impact of acid precipitation held here in March. It was attended by 300 scientists from 20 countries—100 of them from North America.

The conference coincided with the wrap-up of a nine-year \$16 million Norwegian research program on the effects of acid rain on forests, lakes and rivers and on the fish living in such poisoned water—the so-called SNSF project.

In a closing statement, the scientists agreed that:

- Atmospheric transport of sulphur and other pollutants has led to extensive regional acidification of watercourses in areas with very little neutralization capacity, both in Europe and in North America.
- Acidification of watercourses has had major effects on life in rivers and lakes. Lakes in an area of 13,000 square kilometers in Southern Norway have become empty of fish in recent decades, and a further area of some 20,000 square kilometers contains lakes with significantly reduced fish stocks.
- No decrease in forest growth has been demonstrated as a result of acid precipitation.
 - Continued research efforts and monitoring are needed.

Norway and Sweden are among the countries worst-hit by acid fallout from Britain and the Continent. Sweden claims that fish have been wiped out in 20,000 of the country's 100,000 lakes and rivers.

Some 150 Norwegian scientists have been engaged in the SNSF project, and foreign experts attending the conference said Norway is well ahead of other countries in studying the damaging effects of acid rain.

SPECIAL TO WER

Forestry...

PORTUGAL WILL PLANT a minimum of 50,000 hectares of trees annually, said Carvalho Cardoso, State Secretary of Agrarian Reform. Lumber processing and burning claim 40,000 hectares every year while planting rates have been a low 15,000 hectares.

Forest experts expect the demand for forest products to increase substantially when the country enters the Common Market in 1985.

The government has international financial aid for the program.

INDONESIA WILL SOON EMBARK on its first full-scale tropical hardwood forest research and reforestation program. The program will be conducted in East Kalimantan. It involves the mass production of tree seedlings in foam plastic block containers, which allows outplanting in the jungle in the original potting soil without disturbing the roots of the seedlings. and a seed orchard and experimental forest enabling research for potential "supertrees" with faster growth and other superior features. The specialized equipment comes from the forest research center of the Georgia-Pacific Corp. in Oregon, U.S.A. and is to be installed by the company's Indonesian subsidiary, P.T. Georgia-Pacific at Batu Redi on the Telen River.

CHINA has set aside a 1,134 hectare natural reserve in the southern province of Guangdong as an international scientific research area. Chinese scientists and UNESCO representatives recently carried out a preliminary joint survey of the Dinghu hill region, which has the characteristics of a primitive subtropical monsoon and evergreen broadleaf forest.

THE THAI FORESTRY DEPARTMENT recently announced that 11 tourist areas will be established as national parks this year, including four marine parks. A Department spokesman said that royal decrees for their establishment will be promulgated this year. At present, there are 16 such parks in the country. More national parks will be set up in 1981, the spokesman said.

The national park system was developed in Thailand in the late 1950s with the purpose of preserving the country's remaining scenic and wilderness areas. However, rapidly increasing visitor levels at all major parks are putting new strains on park management and budgets and may mean that conservationist priorities are sacrificed to the immediate needs of tourist management.

Meetings . . .

MAY 27-30. Petroleum and the Marine Environment International Conference and Exhibition: organized by Eurocean; in Monte Carlo, Monaco. Contact Ms. R.S. Murray, Eurocean, Villa Richard, Rue de l'Abbaye, Monaco-Ville, Monaco.

MAY 28-30, International Conference Application of Appropriate Technology to Chemical Dose and Chemical Residue Monitoring; Sponsored by the U.S. Environmental Protection Agency's Office of Research and Development, Health Research Division, at the Sheraton International Conference Center, Reston, Virginia. Contact Michael Waldman, Enviro Control, Inc., P.O. Box 827, Rockville, Md. 20851, USA.

JUNE 9-20, Seminar on Principles of Environmental Management in Developing Countries; sponsored by the International Environmental Management Institute at the address below; tuition \$2500. Contact John Whitman, ERT, Inc., 696 Virginia Rd., Concord, Mass. 01742, U.S.A.

JUNE 16-19, Woodpower '80, an international symposium on forestry and wood utilization; sponsored by the International Science and Technology Institute, Inc. at the Capitol Hilton Hotel, Washington, D.C.; cost \$395. Contact Dr. James J. Talbot, Woodpower '80, 1129 20th Street, N.W., Suite 511, Washington, D.C. 20036.

JUNE 22-28, International symposium on "Effects of Air Pollutants on Mediterranean and Temperate Forest Ecosystems;" sponsored by a number of U.S. and international forestry agencies and groups; at Riverside, California. Contact Dr. Paul R. Miller, Pacific Southwest Forest and Range Experiment Station, 4955 Canyon Crest Drive, Riverside, Cal. 92507. U.S.A.

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Sulphur dioxide Milan's famous cathedral

MILAN-Milan's gothic cathedral, which residents consider the symbol of this Italian industrial capital, is suffering from "marble cancer," a modern plague that is eating away statues adorning its walls and spires.

Pieces of marble falling 25 meters a few weeks ago renewed calls for the salvage and restoration of one of Italy's most significant monuments. The municipal council has allotted an extra \$1.2 million in addition to a yearly appropriation of \$1.5 million for immediate restoration.

However, \$12 million and nearly 10 years will be needed, according to experts' estimates, to heal the tottering cathedral.

The major disease of the "duomo" is smog, which is turning the marble into crumbling plaster.

Traffic vibrations, pigeon guano and the lowering of the city's watertable are additional and worrying problems.

Carlo Ferrari, who heads the office that maintains the 14th century cathedral, says sulphur dioxide produced by the city's heating system is the primary threat to the 3,159 statues situated along the walls and on 135 spires.

Despite anti-pollution action taken by authorities a few years ago, concentrations of hydrogen sulphate in downtown areas amounted to 0.300 parts per million this winter. Laws provide a ceiling of 0.150 parts per million.

"Through a normal chemical reaction sulphate eats up marble.

Traffic vibrations do the rest," Ferrari explained.

Private traffic has been long banned around the cathedral. However buses and the subway running at both sides of the monument still are a source of severe vibrations. The public transportation company planned to reroute bus service on alternative lines in the short term, and to slow down the subway and strengthen its infrastructure.

The maintenance office meanwhile is planning a massive cleaning operation on walls and statues to remove the crumbling parts and to paint them with protective synthetic resins. The system has been successfully tested on the front wall and, Ferrari said, "It will safeguard the statues for a long time against any further damage from smog."

Restoration plans also include low tension electric wires on overhangs to prevent pigeons from staining and damaging statues.

The cathedral's four major pillars, which bear the 108-meter high central spire, have been steadily sinking in recent years, but there are plans to strengthen and stabilize them. Massive water pumping by industrial plants and by the city were blamed for the lowering of the water bearing stratum. PIERO VALSECCHI

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APRIL 7, 1980

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Preview of "Global 2000," America's look at the future

WASHINGTON—What will the world look like by the year 2000? Continuation of rapid population growth, no early end to energy problems, an increasingly tight food situation, and, says the man who's been studying it all for more than two years, "the environment will take one tremendous beating."

In a nutshell, these are the pre-publication conclusions of the "Global 2000" study, compiled and analyzed by Gerald O. Barney, of President Carter's Council on Environmental Quality.

"In the beginning," said Barney, "we decided to make projections under a single policy assumption—the continuation of present policy." This assumes rapid technological growth. Fifteen U.S. government agencies predicted what the year 2000 would look like to them. Barney analyzed their projections and compared them with other global studies. He looked first at population and gross national product, then projections of resources and finally made an environmental analysis.

On population, Barney has found, "the growth will be extensive," and that a figure of 6.3 billion (a third more than today) would be "quite reasonable."

On food: There seems to be a turnaround in death rates. In a number of places death rates aren't going down as they have been. "There are now places where that has stopped, and life expectancies are not increasing. In bad crop years, the death rates have increased."

On energy, Barney believes there is a "clear indication alternative energies have a great potential as time goes on," but his study—based on current policies—does not address alternative energy sources specifically.

And why will the environment take a beating? "Because of all the things implied by other projections, of water, energy and food for example. We will present evidence of serious problems" around the world. The main ones, he said, are loss and deterioration of soils; deforestation; acid rain; increasing carbon dioxide; the disposal of nuclear wastes; the impact on fresh water from pesticides, erosion and sewage; and agricultural expansion increasing related diseases such as schistosomiasis and malaria.

"Our charter precluded us from making policy recommendations," Barney continued, "but we can point out that business as usual leads to problems. And we have come up with a few things

Land Use ...

BOLIVIA'S FERTILE VALLEYS, which stretch through half the country, are being badly eroded, primarily because of bad land management by the peasants, says a technical report by the Bolivian Academy of Sciences.

The report, written by Ing. Humberto Gandarillas, one of the country's outstanding ecologists, warns that the impoverishment of Bolivian land will approach "dangerous limits in a relatively short time."

Some of the reasons for this erosion by mountain streams are that traditionally the peasants have sown their fields downhill rather than around the curve of the hill; they also make springs to set property limits, and the springs degenerate into streams; and sheep are overgrazing the pasture.

The report is under consideration at the Ministry of Agriculture. "Action is urgently needed, otherwise we will face a sharp decline in agricultural output," warned Gandarillas.

NO MORE HOUSING developments will be permitted in the wooded areas around Mexico's northern industrial city of Monterrey, Gov. Alfonso Martinez Dominguez, governor of the state of Nuevo Leon, has announced. Except for cemeteries, no building will be permitted in the area and tree-planting and conservation programs will be initiated.

THE UN'S FOOD AND AGRICULTURE Organization signed an agreement with the Indian government to contribute \$209,000 for integrated watershed management, planning and monitoring.

The 1978 floods affected most of the Gangetic basin, and a working group set up by the government has recommended an integrated approach to soil conservation, forestry, agricultural production and animal husbandry, including watershed management for the catchment area of 18 flood-prone rivers.

CHINA will soon start a comprehensive survey of the coastal region and tidal flats along its 17,968-kilometer-long coastline. The survey will be jointly undertaken by the Oceanography Bureau and a number of coastal province and city administrations.

Attention is to be paid to the potential for exploitation and utilization of low land that can be reclaimed from the sea. At the same time, pollution in coastal regions and its prevention will also be studied. The survey is expected to be completed by 1985.

that are do-able. My sense is that everywhere, both here and in other countries as well, a lot of people are recognizing things aren't working. Inflation, for example; no one knows what to do about it. Today there's a receptivity on the part of more people than usual to think about things differently than in the past."

At this point, he said, there is not any well-developed idea of what to do as a follow-up to the Global 2000 study. "This is understandable," he said, "for there is a lot of material to absorb and understand. Then we'll get on to what do we do about it."

LIBBY BASSETT

Venezuela's high-tech farming is "irreversibly damaging"

CARACAS—A biologist at the Central University of Venezuela says he has found symptoms of "alarming degradation due to the accentuated process of erosion" in the Andean zone where intensive farming is practiced. Of Venezuela's nearly 30,000 square kilometers of arable land, 12,000 are under intense cultivation.

Dr. Federico Pannier believes that Venezuelan agriculture suffers from the "inappropriate use of high technology farming intended only to boost economic productivity, and from indiscriminate use of machinery, irrigation systems, chemical fertilizers and pesticides." He charged Venezuelan farmers with ignoring the ecological risks endangering tropical soils, which lose their fertility rapidly under intense cultivation.

Some 400 kinds of insecticides, chemical weedkillers, etc. are used without control, without recognition of the "irreversible damage" which an inadequate knowledge of their use may lead, Dr. Pannier said. At the same time, vast quantities of chemical fertilizers used by rice and corn planters are retained by tropical soils, and the irrigation run-off causes eutrophication of downstream water.

According to CONICIT, a government research bureau in Venezuela's developing regions, there are 113 million tons of unused wastes and organic residuals (not including city garbage or cattle manure) perfectly suited as a source of potential nutrients for farming. These include 600,000 tons of rice straw, 1,770,000 tons of maize waste and 331,000 tons of sugar cane leaf which are thrown away yearly.

Dr. Pannier's special interest is mangrove ecology, and he reported that "Venezuela is taking serious measures to halt the progressive deterioration of the coastal-marine ecosystems, a result of encroachment by land development, shipyards, airports and roads, and destruction by wood-cutters and coral-lime excavators."

Through FUDENA (the Foundation for the Defense of Nature) Venezuela is designing a program for coastal land management and planning, now being carried forward by the government. And the Environment Ministry recently decided to establish in Zulia State a biological station for research in mangroves, the first of its kind in the tropical New World. It will develop appropriate technologies not only for Venezuela but for other tropical marine areas.

HILARY BRANCH

Argentine land loss is due to slash and burn farming

BUENOS AIRES—Argentina's Tucuman province stands to lose some 30,000 hectares of highly productive land through erosion due to misuse and poor farming methods.

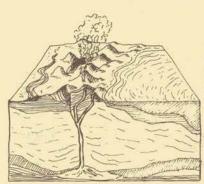
Reports from eastern Tucuman say that vast expanses of topsoil are being washed away. This, observers say, is because farmers have deforested the land and failed to take even the minimum of conservation precautions.

For many years this area, much of which was covered by dense forest, was considered "poor" agriculturally, due to the fact that the crops sown traditionally fetched a low price on the Argentine market

But when soybeans were introduced, farmers found that they brought in a very high yield, as did certain grains. These results led Tucuman farmers to begin clearing large sectors of forest so that today the once heavily wooded area has only a smattering of trees.

To add to the problem, the Burrayacu region of the province is hilly, and methods such as contour plowing have apparently not been employed in dealing with this problem. Another factor bringing ever-increasing erosion is that rainfall over the past several years has been heavier than usual, thus washing away greater quantities of topsoil which tend to gather in natural depressions and drainage areas compounding the problem by eliminating natural runoff zones.

Tucuman officials are understood to be studying emergency measures to force land conservation on the area in order to halt the advance of massive erosion before it is too late.DAN NEWLAND



Mexico's investigating 130 new regions for geothermal energy

MEXICO CITY—With 130 possible geothermal regions, Mexico could be producing 20 billion kilowatt-hours of geothermally-produced electricity by the year 2000, a spokesman for the Federal Electricity Commission said. Officials believe Mexico is one of only eight nations using geothermal energy, and it is already exporting electricity from the hot underground sources to the United States.

At Cerro Prieto in the Mexicali Valley across from the California border, a four-unit plant utilizing 30 wells is producing 150,000 kwh now. Plans are underway to increase the nation's productivity to 400,000 kwh by 1984, the spokesman said, by enlarging that plant or constructing others. President Jose Lopez Portillo has a special interest in the geothermal future: As director general of

In Latin America . . .

THE WORLD'S WORST OIL SPILL, Ixtoc-1 in the Gulf of Mexico, has finally been plugged up—nine months after it blew out.

A spokesman for Pemex, the national oil company, said that more than 3.1 million barrels of crude oil had been lost in the spill, nearly twice as much as the worst previous disaster, when the Amoco Cadiz went aground off the coast of Brittany in March, 1978. Hundreds of sacks of quick-hardening cement were poured into relief wells to plug the flow, which had been gushing since last June 3.

The environmental consequences of the blowout appear to have been minimized by U.S. and Mexican officials anxious not to strain bilateral relations further. But it is likely that the spill, which traveled more than 1,000 kilometers last summer from the blowout site to the Texas coast, will harm the Gulf coast ecosystems.

some of Mexico CITY's 11,000 taxi cabs have begun running on a propane-butane mixture, and urban passenger buses will soon be converted as city authorities try to eliminate air pollution—largely caused by internal combustion gasoline engines. When all service stations are equipped with propane-butane gas tanks, all of the taxis will be converted to the cleaner mixture. Authorities said the new mixture costs about 65 cents a gallon, equivalent to regular gasoline, and will enable vehicles to achieve almost the same mileage as they had with gasoline.

VENEZUELA HAS PASSED A LAW regulating noise levels. It will go into effect in June. Noise levels will be measured according to standards of the ISO (International Sound Organization), the IEC (International Electrotechnical Commission) and the International Civil Aviation Organization.

FOUR MONTHS AGO a bus crashed against a main oil and gas pipeline in Venezuela causing a major tragedy (more than 30 dead). As a result, Petroven (the state-owned oil company) has embarked on a complete maintenance program of the pipelines in Eastern Venezuela, including their burial in populated areas.

The pipelines bring oil and gas from the Anaco fields to the port of Guanta 50 miles away. Some are at least thirty years old and border the major highway linking Puerto La Cruz and El Tigre.

an arra ar 11810.

Water wise...

THE INDIAN OCEAN ISLAND of Mauritius is embarking on a wave power scheme aimed at providing one-fifth of the country's electricity requirements. The government reportedly is seeking financing for the project, which will cost about \$40 million to produce 20,000 kw of electricity.

THE PROPOSAL to form a water association for the Asia Pacific region, made at the recent first Asian Water Quality Management meeting, has resulted in the setting up of an 18-member pro tem committee. The association was proposed to close the present gap in communications between national and international associations. Of the 18 committee members, 13 are from Asian countries while the other are from Australia, U.K., Switzerland, France and Sweden.

ONE OF THAILAND'S BIGGEST investment projects, the "Ing River Project," will be submitted to the Thai Cabinet for approval within the next six months, according to the Deputy Agriculture Minister Anat Apapirom. Water from the Ing River in the northern province of Chiang Rai will be siphoned into the Mekong River, and from the Mekong River the water will be siphoned into the Sirikit Dam. Anat explained that water from the Kirikit Dam will irrigate about 480,000 hectares of farmland in the Central Plains, which is the agricultural production belt of the country.

VARIOUS SYMPTOMS of environmental abuse have been worsening in several regions in the Philippines: sedimentation of rivers; frequent destructive floods, which result in food shortages; drought and the drying up of damreservoir systems; and desertification. The ecological deterioration in Luzon, the Visayas and Mindanao is directly caused by inadequate maintenance of forest cover on slopes and uplands, said the Forestry College of the University of the Philippines.

A JAPANESE CONSTRUCTION MINISTRY mission is currently conducting a survey in Malaysia in preparation for joint cooperation on a water resources development project.

Demand for water in Malaysia has been increasing because of improved living standards, and a water shortage is apparent in some areas

The mission plans to return to Japan in late May to set up a detailed study and master plan to be submitted to the Malaysian government by 1982.

The mission will also give advice to the Malaysian Government on legal and administrative matters connected with the development of water resources.

the electricity commission, he initiated the Cerro Prieto plant in 1973; as president, he dedicated the third and fourth units of that power plant last year.

Besides supplying the agricultural, industrial and tourism needs of the Mexicali area, there is enough electricity left over to export it across the border to San Diego, California. Present production of the plant is equal to a saving of 2 million barrels of oil annually.

Geothermal regions are places of volcanic activity at or close to the earth's surface. KATHERINE HATCH



Romania plans a massive Black Sea wave-power project

BUCHAREST—Romania will experiment this year with a test plant designed to harness the energy of the Black Sea's waves.

Scientists at the Romanian Institute of Marine Research in the port city of Constanta warned that the problem is "complex" and "costly," but they hoped "it will justify the continuation of research in this field."

According to recent measurements, the gross energy output contained in waves along the 200-kilometer Romanian coastline is some 9-10 billion kwh a year. Of this, specialists hope to turn some 5 billion kwh into electric power, the rest of the energy being lost through picking-up operations, conversion, storage and transportation.

Long-range plans call for large dams perpendicular to the coastline or delimiting vast port basins to be built until the year 2000; the wave-power equipment will be incorporated into these dams. To offset the high cost, the scientists point out that these dams or seawalls will protect the coastline from erosion, a serious problem in Romania.

Scientists also plan to use "floating dams," which they describe as being more economical. These will be anchored on the sea floor and be equipped with various systems for collecting wave power.

A third project takes into account the combined action of sea, solar and wind powers. A wind-powered pump and a solar-powered engine will be used to channel water through a pipeline along tens of kilometers of coastline to as high as 25 meters. It will then flow down to a small power plant located at sea level. This project, which can also make use of residual waters from the Constanta sewage network, is to be tested first on a few kilometers of pipeline.

SPECIAL TO WER

England thinks estuary energy may help meet its power needs

LONDON—Britain's chance of becoming the first country in the world to establish a major scheme to harness tidal energy came a step nearer with the recent publication of a progress report by the Severn Barrage Committee, set up in 1978 to consider feasibility.

There is no technical reason, says the report, why electricity could not be generated from the enormous tidal range of the river Severn estuary, near Bristol.

The flood tide would be allowed through sluices into the upper estuary and captured by a barrage on its ebb flow to drive electricity-generating turbines.

The committee, under the chairmanship of the Department of Energy's chief scientist Sir Hermann Bondi, now believes that output could be more than first estimated, providing between 5 percent and 10 percent of the country's total electricity needs.

Installation costs would be high (perhaps \$22.5 billion), but running costs comparatively low. The 2p or 3p (4.5 or 6.75 cents) per kilowatt/hour suggested by the report, would become increasingly competitive with the rising cost of oil and coal power stations.

The final report in this pre-feasibility study should appear in a year's time. It will discuss environmental implications, in particular the effect on the tidal regime around the coast, navigation, wildlife and amenity values for the local population.

BARBARA MASSAM

In the world's energy future, fuelwood plays a big role

ROME—A group of forestry experts from several countries and international organizations met here recently to discuss fuelwood as an energy source, in preparation for the 1981 UN Conference

on New and Renewable Sources of Energy.

Nearly half the world's people use wood as fuel. Although wood is a renewable source of energy, forests are being depleted by the increasing demand for firewood, due to population increases. The World Bank estimated in 1978 that many developing countries would have to dramatically boost their current afforestation programs to meet fuelwood requirements. The current rate of planting, for instance, should be multiplied by 50 in Ethiopia and Afghanistan, by 15.5 in India and by 10 in Nigeria to meet requirements up to the year 2000.

The Rome Panel on Fuelwood and Charcoal said an updated review of fuelwood production and use is necessary, as is identification of the required issues and action programs. The panel will meet again next December to define its contribution to the forthcoming UN Energy Conference. VITTORIO PESCIALLO

Renewable Energy...

THE SOUTH AFRICAN GOVERNMENT has offered 4 cents a liter additional profit to any producer of fuel from products other than crude oil.

However, the Minister of Environmental Planning and Energy, F.W. de Klerk, warned it was inadvisable to rely too heavily on agriculture for fuel production. At most 20 percent of the country's fuel needs could be grown, he said.

Two companies are considering big ethanol projects in black rural areas as a result of the concession.

Sentrachem's Dr. Robbie Robinson has said that an ethanol industry could provide 800,000 new jobs and have a turnover of R625 million annually (\$768 million). With a crash program, maize, sugar, sorghum or cassava could move from seed to petrol tank in two years.

THE SOUTH KOREAN Ministry of Energy and Resources will construct 2,200 solar energy houses this year as part of its efforts to develop solar energy as a substitute for conventional energy resources such as coal and oil, say Ministry officials. Of the total, 1,700 houses will be less than 132 square meters in floor space each and 500 houses more than 132 square meters. The Ministry also plans to build 100 solar classrooms at 10 primary schools throughout the country this year.

In order to encourage the construction of these houses, the South Korean government has already lowered tariffs on imports for the copper plate, copper pipe and reinforced glass which are the raw materials for manufacturing the solar collectors.

CHINA, with 7.2 million installations, leads the world in the use of biogas to produce energy, said Paolo Bifani, who heads the United Nations Environment Program's appropriate technology unit.

India, other South-East Asian countries, and a growing number of countries in Latin America, now also use biogas on a big scale.

Africa has comparatively few biogas installations. The reason, Bifani says, is mainly "cultural" as most Africans don't like to handle the organic wastes that go into biogas plants. But efforts are being made to get more African countries to use the system, and demonstrations of biogas plants will be given at an energy conference to be held later this year in Lagos, Nigeria.

Forestry...

THE WORLD BANK has granted a \$6 million loan to the Development Bank of the Philippines (DBP) to transform idle agricultural lands in eastern Mindanao, in the far south of the country, into small-holder tree farms.

Two million dollars will go to the DBP's first pilot tree farming project in three provinces. The project will rejuvenate arid, unproductive land and provide much needed employment in the region. At full production, the tree farms will produce 2.7 million cubic meters of pulping material annually worth \$22 million. The market outlet will be the Paper Industries Corporation of the Philippines.

The remaining \$4 million will go to farmers producing fast growing species for firewood, pulpwood, charcoal and leaf-meal production.

RURAL INDIA will face a fuelwood crisis by the next decade, says J.S. Vermah, President of the Forest Research Institute.

There will be a deficit of 100 million cubic meters of fuelwood by 1990 when the rural demand for it would be 300 million cubic meters, he said.

He therefore advised people to "launch a program on a war footing" to plant quickgrowing trees on 22 million hectares of wastelands along roads, canals, rail tracks and villages.

THE INDIAN GOVERNMENT has asked all agriculturists to plant neem trees to halt desertification in India.

Prime Minister Indira Gandhi deplored that the neem tree, once popular and put to hundreds of uses to cure sickness, should have been neglected in India.

According to the National Chemical Laboratory in Pune (Maharashtra State), another benefit is that neem trees prevent insects from laying eggs which cause damage to many trees.

THE INDONESIAN GOVERNMENT recently designated two plots of forests covering 300,450 hectares in Irian Jaya province as nature preservation areas, according to the Agriculture Ministry.

Previously, the Agriculture Ministry designated 2,500 hectares of forest land in Angrameos island as an animal reserve, while 100 hectares near the town of Nabire and 1,500 hectares in Mount Meja in the same province were designated as parks. These plots of forests are inhabited by several species of protected animals, the Ministry said.

Experts suggest answers to halt tropical forest loss

NAIROBI—For six days 50 experts on tropical forests met here to discuss how best to conserve and wisely use this rapidly diminishing natural resource.

The meeting was organized by the UN Environment Program (UNEP) with help from the UN's Food and Agriculture Organiza-TION (FAO) and its Educational, Scientific and Cultural Organization (UNESCO).

All in all, said participants, the meeting was a success. Despite pre-meeting friction between UNEP and FAO, the atmosphere was generally harmonious. There was general agreement that conservation measures are essential but must be viewed in the overall context of development.

The attitudes of the experts representing tropical forest nations ranged from those from Thailand, who seemed eager for assistance in slowing deforestation, to those from Brazil, who repeatedly stressed concern for national sovereignty.

The meeting recommended steps to raise national awareness of tropical forest issues; priorities for monitoring, research and information sharing; steps to improve the management of tropical forests; and recommended strengthening institutions to make this possible.

Although it was agreed that increased funding will be necessary, none of the developed-country experts presented specific proposals for stepped-up aid, and there was an undertone of resistance to the idea of a special fund.

The consensus at this meeting was that methods of funding and further elaboration of an international program should be the business of a second experts' meeting.

UNEP's Executive Director Mostafa K. Tolba was to transmit these recommendations to the UNEP Governing Council meeting in April and propose that a second meeting be convened after governments have had a chance to respond to the Nairobi recommendations.

SPECIAL TO WER

South Pacific fish are dying. Could it be nuclear testing?

PAPEETE, Tahiti—Even paradise has its environmental problems these days.

In the early '60s the French military came in force to Tahiti and though they brought with them a greater assortment of cheeses and wines than French Polynesians had hitherto enjoyed, they brought inflation and nuclear testing as well. Though fallout from the early atmospheric testing was negligible in Tahiti itself (as it was in other islands in the chain, like Bora-Bora), New Zealand and Australia were not so fortunate. Under pressures, the French have since discontinued these atmospheric tests, but in their stead they are now conducting underground testing on the atoll of Murovua—several hundreds of miles east of Tahiti but relatively

close to the Australs and Gambiens, between which it lies and around which migrate large populations of fish.

Some inhabitants of these South Pacific islands, where at the turn of the century a tormented Gaugin painted idealized nudes amidst a people long-clothed by missionaries, complain not that radioactive fallout is contaminating fish in the area—fish, of course, being the staple of the Polynesian diet—but that man's disturbance of the coral there has released a toxic enzyme or other agent that has poisoned the fish and made them unfit for human consumption. Critics of French nuclear testing, which evidently is carried out in large chambers drilled deeply into dead coral, claim that the poison is affecting not only the region's reef fish, but the passing pelagic varieties as well.



Whether or not fish in the lagoons surrounding nuclear installations have in fact become poisonous, the French authorities have reportedly banned their consumption. Not surprisingly, the French government forbids foreigners from entering the area.

There are those here—and not necessarily just those connected with the French government—who dispute the view that the tests have been responsible for poisoning fish. They insist that the rumors, at worst untrue and at best unsubstantiated, have been spread by Polynesian "independentists," an extremely small segment of the population, and by rabble-rousing anti-French foreigners residing here. How, these skeptics ask, can tests that take place in long-dead coral affect living coral a considerable distance away?

The answer is that they very well might, though the reason why is unclear. As the skeptics themselves admit, there is a littleunderstood but well-known poison found in fish in tropical waters that, though seldom fatal to humans who eat them, can be seriously incapacitating. Cases of what is now identified as ciguatera—named after a small mollusk common in Cuba—have been reported since early Egyptian times, and the frequency of its occurrence is known to increase following sudden and violent changes, natural or otherwise, in the environment. If even an unusually large rainfall can, by creating a momentary imbalance in the fresh to salt water ratio, disturb coral growth and produce the poisonous algae upon which lagoon fish feed, it would seem safe to assume that the construction of nuclear installation on atolls in the Pacific-not to mention the detonations themselves-might be considerably more deleterious to fish and consequently, human life.

Conclusive proof of this, of course, must await further research, but many residents doubt that the French authorities will allow full disclosure if the finding of such research is adverse to their interests.

DAVID FINKELSTEIN

Toxics . . .

MORE THAN 20 YEARS after the U.S. stopped atmospheric nuclear tests over the Bikini Atoll in Micronesia, some of the islands are still unfit for human habitation, according to a scientist of New York's Brookhaven National Laboratory.

The U.S. government allowed Bikinians to return in 1968 and agricultural rehabilitation followed with coconuts, breadfruit and pandanos planted. While radiation contamination among new settlers in 1974 was low, a dramatic increase was noted in 1978 by Brookhaven scientists in 15 adults, with six of them having twice the amount of radiation allowed.

U.S. WASTE DISPOSAL COMPANIES, faced with new regulations that will strictly control the storage of toxic wastes domestically, have begun negotiations to store American hazardous wastes in some developing countries.

So far, only two U.S. companies are known to have approached about half a dozen Third World governments with the deal. A U.S. State Department official confirmed that Haiti, Chile, Sierra Leone, Liberia and other West African countries had been offered up to \$25 million each annually. Because of unfavorable publicity, both in the U.S. and West Africa, so far "nothing significant has happened," he said.

The State Department is working with the U.S. Environmental Protection Agency and the Commerce Department to ensure that both the U.S. government and the recipient governments are aware, well in advance, of planned shipments of hazardous wastes. There is also the possibility that certain deals would be off-limits because they would interfere with foreign policy concerns. But all that is still to be worked out.

NATIONWIDE OPPOSITION to synthetic detergents is growing in Japan. About 30 of Japan's 43 prefectural governments have restricted or are going to restrict the use of the phosphoric detergent to protect the natural environment and human health.

THE PHILIPPINE FERTILIZER and Pesticide Authority has launched a nationwide agricultural pesticide monitoring program to safeguard public interest and safety in the use of agricultural pesticides. The monitoring program will cover pesticide formulations and pesticide usage as they affect aquatic and terrestrial ecosystems and agricultural products. According to Assistant Secretary of Agriculture Miguel M. Zosa, random sampling and analysis will be undertaken of formulations collected from manufacturing and formulating establishments, warehouses and market shelves. These samples will then be checked for the correctness of the formulation as stated in the label.

Environmental management . . .

THE CENTER FOR INTERNATIONAL ENVIRON- MENT Information, which publishes *WER*, has just completed a survey of government agencies in developing countries that have environmental responsibilities.

The list has grown enormously since 1972 when the UN Conference on the Environment was held in Stockholm. Then only 11 developing countries had any sort of environmental agency. Today, the Center has found, there are 102.

The survey was based on information from World Environment Report, UNEP's Infoterra and correspondence with governments. It lists only the names of the agencies, not their addresses, but they should be available through the embassies of the various countries.

This list is available free of charge from the Center, 300 East 42nd Street, New York, N.Y. 10017, U.S.A.

IN TURKEY, an Institute for the Study of Environmental Problems has just been created at Instanbul University. The institute will study environmental problems and their sanitary, economic, social and cultural effects, then devise measures and methods to cope with those problems.

THE GOVERNMENT OF INDIA recently set up a 10-member committee to recommend legislative measures and administrative machinery for ensuring environmental protection and ecological balance.

This action was taken following President Neelam Sanjiva Reddy's suggestion that special measures are needed to maintain India's ecological balance.

The committee will submit its report by July 31, 1980.

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Alternative energy in India: pies in the sky and on earth

NEW DELHI—At a recent Science Congress in Calcutta, India's President Neelam Sanjiva Reddy asked scientists to "seek out alternative sources of energy—within a reasonable time frame."

India is feeling the energy crisis. At gas stations, oil company billboards warn: "Save that drop of oil, or walk to your destination 20 years from now."

Indian scientists are already looking for alternative sources of energy. India's Planning Commission has decided to allot \$30 million to conduct a number of studies with special emphasis on energy.

No single energy source can meet the entire demand in any country, and optimal utilization of a mix of different types of energy sources have to be adopted depending on the particular resources and conditions in each country.

The President of the Indian Science Congress, Professor A.K. Saha, suggested an urgent plan to introduce hydrogen as India's future fuel. He foresaw "doomsday" for oil imports in just three years and for domestic oil in a decade's time. According to him, coal will last till 2260 A.D. Even the demand for cow dung "will very soon outstrip the supply" at the current population growth rate in rural areas. He called also for intensifying research and development programs for the production of ethyl alcohol from biomass for use in the transport sector.

Two Indian scientists, U.R. Rao and S.P. Kosta of the Indian Space Research Organization at Bangalore, think that a space-based solar power system offers unique advantages for large-scale power production. According to them, solar energy could be collected at altitudes of around 36,000 kilometers either using the photovoltaic principle employing large areas of solar cells or through the thermal process using conventional heat turbines.

This energy would be converted into microwave energy for efficient transmission to desired locations on the ground. The microwave energy would subsequently be reconverted back to electrical energy for feeding large urban industrial complexes.

Animal power is another answer. The Madhya Pradesh State Minister of Forests announced that 50 centers will be opened to manufacture bullock carts (at an estimated cost of \$200,000) and poor villagers would get help with loans from banks. The minister also promised to give them jobs to enable them to repay the loans in easy installments.

And a new device to produce power from cow dung has been invented by the farm department of the government of Tamil Nadu.

On a regional level, experts from six nations (Afghanistan, Iran, Pakistan, Nepal, Bangladesh and India) met in Bangalore in March to discuss future energy planning and to probe the potentials of solar, wind, biogas, biomass and other energy sources that can be harnessed locally to reduce their dependence on oil. The meeting was organized by the UN Environment Program in cooperation with the regional center at Bangalore. R. MURALI MANOHAR

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MARCH 10, 1980

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A World Conservation Strategy is launched in 30 countries

NEW YORK—The World Conservation Strategy was launched March 5th by kings, princes, presidents, prime ministers and other leaders in some 30 countries on every continent. The Strategy, however, is for all nations, whatever their political persuasion, and its purpose is to safeguard our earth's living resources for future generations before it is too late.

"Because the man-to-resource ratio is changing," explained Noel Brown, head of UNEP's liaison office in New York, "we must rethink our relationship to the biosphere." He said the Strategy has three primary objectives: maintenance of our life-support systems, such as our water, soil and air; preserving our genetic diversity; and ensuring the sustainable use of our fish, wildlife, forests and grazing lands.

The comparatively brief and readable Strategy was commissioned by the U.N. Environment Program (UNEP) and was prepared by IUCN (International Union for Conservation of Nature and Natural Resources) with help from UNEP, UNESCO, the U.N. Food and Agriculture Organization and the private World Wildlife Fund. More than 450 government agencies and conservation organizations in over 100 countries worked together with IUCN's six commissions of more than 700 scientists and other experts to prepare the Strategy. It took nearly three years, many reviews and several drafts to produce a consensus document that governments and development agencies could accept as an action plan.

Robert Allen, Senior Policy Advisor to IUCN, compiled and edited it. At a briefing before the world-wide launch, he said that too often "conservation has been associated with pessimism and opposition to progress," but that this Strategy outlines "the art of the possible" so that conservation and development can be linked. He said that just one-fifth of the tightly outlined document deals with global environmental problems and "four-fifths is devoted to what should be done."

Since it is for use in all countries as a guideline, the solutions proposed do not deal with specific country problems but rather with those that affect all nations—and they are numerous. The Strategy is designed to act as a catalyst to help countries help themselves now. And already, said Allen, through the process of identifying mutual problems and solutions, several governments have begun to act. He said Thailand and India included conservation strategies in their five-year plans; the Soviet Union and New Zealand are developing national conservation strategies; and China has declared March national conservation month and is planning widespread education programs.

LIBBY BASSETT

Environment & Development . . .

THE STUDY OF AMERICA'S bilateral aid program and its environmental policies, procedures and performance (see adjoining story) was done by the Natural Resources Defense Council. It says that USAID has made significant progress during the last five years in the environmental and natural resource area. However, NRDC recommended a number of actions the agency should take—three of highest priority:

• AID should complete environmental profiles of the 20 highest-priority aid-receiving nations (as measured by the seriousness of their environmental problems) by the end of 1980 and have them for all its aid recipients by the

end of 1981.

 AID's environmental division is seriously understaffed; new specialists must be hired.

AID should more closely oversee the implementation of environmentally sensitive projects, such as dams, roads, irrigation and new lands development.

BARBARA WARD (Baroness Jackson of Lodsworth) said she will retire on April 1st as President of the International Institute for Environment and Development (IIED). IIED's Board of Directors has named William Clark as her successor. Clark is retiring as a Vice-President of the World Bank to accept the IIED post.

Barbara Ward, President of IIED since its foundation in 1973, is retiring because of ill health. She plans to continue to write and has agreed to continue to serve as Chairman of the

HED Trust.

IIED works closely with governments, U.N. agencies and non-governmental organizations on global development and environment issues.

TWO BOOKLETS may help you in your development projects: The first is "Environmentally Sound Small Scale Agricultural Projects—Guidelines for Planning." It's published by Volunteers in Technical Assistance (VITA) and The Mohonk Trust, costs \$3.95 plus postage, and is available through VITA, 3706 Rhode Island Ave., Mt. Rainier, Md. 20822, U.S.A. The second is the "Appropriate Technology Sourcebook," a guide to practical plans and books for small-scale technology. It can be ordered from: Appropriate Technology Project, Volunteers in Asia, Box 4543, Stanford, Cal. 94305, U.S.A. for \$4.50 in developed nations and \$2.25 in developing countries.

The eco-practices of six national aid agencies assessed

BERLIN—For 18 months a study has been underway on the environmental practices of six of the world's biggest bilateral aidfor-development programs. On February 8-9, senior environmental officials from the nations studied met here with members of the independent teams that assessed their programs. It was an informal, off-the-record meeting to get reactions to the teams' preliminary recommendations.

The study was carried out by the International Institute for Environment and Development. (IIED also did the well-received study of multilateral development agencies and banks, "Banking

on the Biosphere?")

This second, parallel study's purpose was to assess the extent to which policies, procedures and programs of the bilateral agencies promote sustainable, environmentally sound development in Third World countries; to examine the constraints to improved performance; and to recommend changes that might be necessary and, if possible, to diminish these constraints.

Programs being studied are those of Canada, the Federal Republic of Germany, the Netherlands, Sweden, the United

Kingdom and the United States.

After additional comments from the agencies are received, the comparative study will be released in the spring. SPECIAL TO WER

China and the U.S. sign an environmental protocol

WASHINGTON—Poised for its leap toward industrialization, the People's Republic of China (PRC) has turned to the United States for advice on how to plan for the environmental hazards that lie ahead. The two countries recently signed their first formal protocol promising cooperation and scholarly exchanges on protection of the environment, and U.S. environmental officials predict it will help introduce new ideas and techniques to both countries.

Culminating several years of tentative negotiations, the Feb. 5th protocol was signed by Environmental Protection Agency Administrator Douglas Costle and Li Chaobo, Director of China's General Office of Environmental Protection. The document lays the diplomatic foundation for visits by delegations of environmental scientists to exchange information under the aegis of a three-member environmental working group in each nation. The organic agreement will be augmented with "annexes" spelling out specific areas of cooperation.

"China has focused on production and the need to increase production, both because of a desire to industrialize and a rapidly growing population," explained EPA China expert Linwood Starbird, who accompanied Costle on his recent trip to Peking. Trade-offs between environment and development have favored production in the past, "but that attitude is changing," Starbird

said. There is now an identifiable group of people in the People's Republic that is concerned about the environmental effects of development, he said, noting that each Chinese ministry now has an environmental specialist.

The People's Republic passed a general environmental protection law in 1979 that set goals but no specific standards. Some pollution limits were adopted in the 1950s governing concentrations of chemicals in dwellings and workplaces, waste water disposal and sewage. In some areas such as the use of biological controls in pest management, the Chinese are quite advanced, and they may present U.S. scientists with some surprises, said Starbird.

Rapid industrialization can portend rapid environmental degradation, and so China is sending delegations to the U.S. this spring to take short courses on how to gauge the environmental impacts of industrial siting.

Also of interest are the health effects of producing and burning coal, abundant in China, which is used for cooking and heat as well as in power plants and factories. Environmental cost-benefit analyses, mysteries still to be plumbed by U.S. policy-makers, are also high on the Chinese agenda.



While the protocol's nuts and bolts are yet to be attached, at least one expected annex, governing wildlife and national park protection, is beginning to take shape. The Costle delegation also included David Hales, the Department of Interior's number 2 expert on fish, wildlife and park management. Hales said Chinese and American officials have identified five areas of interest:

- Protection of endangered species. Due to population pressure, there are "an incredible amount" of endangered animals in the People's Republic, Hales said, including the panda, blacknecked crane, snow leopard, Yangtse dolphin, and Pere David deer.
- Use and protection of plants. "The PRC has a long history in botanical knowledge of the use of plants and herbs, and there's an opportunity for them to teach us a lot," said Hales, adding that the U.S. can offer its experience in plant protection and management.
- Exchange of popular information. Interior plans to help American journalists in the environmental field visit and write about China's environmental protection efforts.
- Government organization. For example, the Chinese Ministry of Forestry is interested in how the U.S. National Parks Service and the Fish and Wildlife Service manage their resources "from the National Environmental Protection Act on down to how we make a park," Hales explained.
- Exchange of technical personnel. PRC technicians will not only visit U.S. universities but will work alongside national parks superintendents to get a first-hand view of how U.S. environmental resources are managed.

 CHRISTOPHER JOYCE

In China ...

IN A SIGNIFICANT environmental protection move, the Chinese government has decided to let factories retain profits made from reclamation and recycling of industrial waste materials.

The decision was announced in a circular issued jointly by the Ministry of Finance and the Environmental Protection Office of the State Council (Cabinet). The text of the circular also was published in the national labor newspaper, "Workers' Daily."

Profits may be used to reinvest in recycling and reclamation projects and to provide individual rewards to workers who make "outstanding achievements in environmental protection."

The circular also stipulated that products which use industrial waste as raw material will be exempted from tax.

THE CHINESE MINISTRY OF HEALTH and the State Labor Bureau have recently enforced a tentative program—Health Standards for Noises in Industrial Enterprises—to protect people from harmful noises. This program calls for a noise level of not more than 85 decibels for all production workshops and operating areas of an industrial enterprise. This standard can be increased for workers who are exposed to noise for less than eight hours a day.

A NUMBER OF POLLUTION CONTROL projects have cut down industrial pollution in Bohai Bay and the Yellow Sea off China's east coast in the past two years. According to the Environment Protection Office of the State Council in China, chromium, cadmium, lead and copper in the sea waters are now below the level permitted in fishing waters. Eight new stations to purify oily water were constructed at the oil fields on the east China coast. Five refineries are now able to clean their oily water to about 80 percent purity instead of only 30 percent as in the past. Equipment was also installed at Dalian, Qingdao and other east coast harbors to clean dirty water and other wastes discharged from ships.

SOLAR WATER HEATERS are being produced in Shanghai, China's largest industrial city. The Shanghai-made solar heater can absorb both direct and diffuse sunlight and heat water to between 40 and 60 degrees centigrade. It also has automatic water temperature regulation devices. The solar heaters are being used by factories, offices and farms in Shanghai and six provinces.

In Africa ...

WORK HAS STARTED on permanent headquarters for the UN Environment Program (UNEP) and the UN Center for Human Settlements (Habitat) on a 40-hectare site at Gigiri, 6 miles from the center of Nairobi. The new complex will also provide space for other UN organizations operating in Nairobi, to form a "UN City."

Natural light is being fully used, and air conditioning will be needed only for some conference and special working areas. Solar panels will provide hot water.

The UN General Assembly voted \$23.5 million for the UNEP headquarters, and an additional \$8.36 million for Habitat's accommodation. The complex should be completed by the end of 1982.

FARM LAND stretching across a fertile belt to the east and north of Salisbury is being prepared for use by returning black Rhodesians.

The land was vacated by white farmers driven out by guerrilla bands. Much of it has lain fallow for four years. Government conservation experts say it must be utilized now because of erosion problems.

RHODESIA will not be taking advantage of solar energy on any scale for many years yet.

In fact, the government needs to increase the Rhodesians' dependence on electricity now that plans are going ahead for three, and perhaps four, new dams across the Zambezi River, which will harness hydro-electric power for both Rhodesia and Zambia.

Solar energy has been tried by hotels and industry, but despite a basically sunny climate, it has never been popular.

THE ANNOUNCEMENT by China News Agency that 170-million Chinese have been sterilized or fitted with birth-control devices led South Africa's biggest daily, The Star, to ask the South African government to adapt China's method.

It calls China's success "astonishing" and "the best bit of news relating to the global population thus far."

It notes that China achieved a halving of its birth rate in six years (1971 to 1978) by providing family planning services, including abortion, and by reshaping economic and social policies in a way that encourages smaller families, even in low income regions.

There was a lesson for Africa's populationstressed areas, The Star said, including Southern Africa where food production was already being outstripped in some areas.

Riot-scarred Soweto cleaned up in a home-grown eco-campaign

JOHANNESBURG—Japhta Lekgetho, a 39-year-old former geography teacher in the all-black township of Soweto, has achieved what the press here call an environmental campaign probably unequalled in South Africa's civic history.

Mr. Lekgetho, inspired by a wilderness trail experience, decided to set about improving Soweto, a poor ghetto that houses 1.5 million people.

In a few weeks he established 35 environmental clubs, organized wilderness trails for their 600 members and then began a systematic clean-up.

In one operation, to clear several hectares of veld which had been used as a dump, 6000 Soweto youths turned out. They piled up mountains of junk including 75 car hulks which the township's local authority then removed. They then declared the place a public park and persuaded authorities to cut the grass and landscape it.

Mr. Lekgetho organized hundreds of school children to clear burned-down beerhalls—relics of the 1976 Soweto riots—and these were turned into neighbourhood parks. Local industries helped the local authority to install playground equipment.

Now he has formed the National Environmental Action Council to organize more clubs and begin a program to plant street trees, encourage the improvement of private gardens and to create a big zoo and recreation resort.

His do-it-yourself effort has just netted his new organization more than \$40,000 a year from a brewery and the possibility of a R1-million (\$850,000) grant from central government.

The Keep S.A. Tidy Association (KSAT), modeled on the Keep Britain Tidy and Keep America Beautiful campaigns, is offering help to establish refuse recycling depots for the township's one million tons of trash. Coal ash (most Sowetans have to burn coal because they have no electricity yet) will be made into building blocks for houses.

Said Mr. Lekgetho: "We want Soweto to become a proper city, and it seemed nobody would help us but ourselves."

JAMES CLARKE

Kenyan range war: people versus wildlife

NAIROBI—Kenya's population is growing at a rate of more than 4 percent a year—way ahead of any other country. It's the fastest rate recorded in history for a single country, and the signs are it could keep on surging for at least one more decade.

All this is grim news for Kenya's development prospects, because there will be expanding pressure on the country's natural resource base—its grasslands, forests, savannahs, water supplies and so forth. Hitherto, only about one-eighth of Kenya's territory has been farmed due to the lack of sufficient rainfall for crop growing in the rest of the country. Now, more and more people

are being squeezed into marginal areas, which are unable to support nearly so many people per square kilometer as the moister one-eighth of the country. And it is precisely in these marginal areas that natural environments are much more susceptible to rapid and often irreversible damage.

What this means is that there is an accelerating threat to the wildlands that have so far been left to herds of wildebeest, impala, gazelles, zebras, giraffes and elephants, together with lions, cheetahs and hyenas.



Kenya's parks and reserves are mostly located in the drier parts of the country. Covering almost 6 percent of national territory, this network of protected areas is something Kenya can be especially proud of. But with every day that goes by, more people are trying their luck in the drier areas: The environs of the Wales-sized Tsavo Park have been subjected to a population increase of 10 percent a year, due more to immigration than to natural increase. Already there are demands that portions of Tsavo Park be excised and handed over to landless peasants.

All in all, the prospect for wildlife by the end of the century must be reckoned dismal at best. A recent World Bank-sponsored project to assess the future for Kenya's elephants, rhinos, buffalos and hippos—wild creatures with the biggest appetites and hence with the largest capacity for conflict with growing human communities—found that Kenya is likely to run out of living space for them and for many other forms of wildlife, well before the end of the century.

NORMAN MYERS

New Zealand aims at energy self-sufficiency

WELLINGTON—The New Zealand Planning Council has recommended the government invest more than \$3 billion in energy self-sufficiency. In one of four options put to the government October 30, the Planning Council proposed a strategy to halve dependence on imported fuels by 1989.

The investment would break down into \$812 million of public sector funds, \$2.3 billion private sector, \$22 billion foreign, and the balance from local funds. The expenditure required would be between 2 and 3 percent of gross domestic product each year for several years, raising total investment from 20 to 25 percent of GDP.

The Council estimated 1500 new jobs would be created.

Council chairman Sir Frank Holmes emphasized there was a need for procedures to ensure that environmental interests are protected.

JOHN KELLEHER

Wildlife...

THE WARS OF AFRICA during the past few years have disrupted government processes and, as a result, have threatened wildlife. Locusts flourished because of the war between Somalia and Ethiopia in the Ogaden. The locust scourge is all the more regrettable because many African nations have taken one substantive measure after another in recent years to extend their networks of parks, expand their anti-poaching patrols and to look out for threatened species.

Chad boasted one of the best-run and largest reserves on the continent, home to the only significant populations of addax and scimitar-horned oryx anywhere. But in the wake of a lengthy guerrilla campaign, the reserve has been virtually written off.

In Uganda thousands of animals have been killed. The only beneficiaries were the Nile crocodiles, for Idi Amin disposed of thousands of his human victims in that nation's rivers.

TANZANIA is one of the leading conservation nations of Africa, if not of the world. It is also one of the poorest—its national budget is just about what Londoners spend on ice cream each year. Yet it devotes a greater share of its meager funds to wildlife conservation than does any other country.

TANZANIA'S proposed 11th National Park at Mahale on Lake Tanganyika is unique in several respects: it will have the widest variety of animal species of any park in the country, it is designed especially to protect the chimpanzee in its natural habitat, and it will be the only Tanzanian park where tourists must view the game on foot.

The park will be research oriented, Scientists such as Jane Goodall, the well-known chimpanzee expert, have been doing studies in this area for almost two decades.

Plans for the park have been prepared by the Japan International Cooperation Agency, and it appears likely they will soon be approved by the Tanzanian government.

PAPUA NEW GUINEA'S wildlife population at the Balamuk Wildlife Station in the Western Province is suffering through the worst dry season in seven years. It is now summer in the southern hemisphere, and pigs, deer, wallabies and birds are migrating from the station while other animals are getting their only water from morning dew or from special watering holes which the Department of Lands, Environment and Conservation is furiously digging.

International cooperation...

ENERGY IS TOP PRIORITY now for policy-makers and the public alike, in rich and in poor nations. And so the United Nations has called a conference on new and renewable energy sources. It will be held in Nairobi, Kenya, a year from August.

Specialists all over the world are already meeting to put together the latest available knowledge on the most promising of these new and renewable possibilities. The conference itself will provide a forum for UN member states to reach agreement on long-range policies for achieving a transition from the present oil-dominated world economy to one in which less depletable sources play the dominant role.

A BASELINE AIR POLLUTION station costing A\$607,000 (US\$674,445) will be built at Cape Grim in Tasmania. It will be part of a worldwide air-monitoring network sponsored by the United Nations. The Cape Grim site was chosen because it enables air sampling from the southwesterly winds which cross the sea south of Australia. The Australian Minister for Science and the Environment, David Thomson, said it will provide information on the constituents of the global air mass. In addition, it will monitor changes to determine whether man-made pollution is changing the world's weather and climate. And it will assess the effects of natural phenomena such as volcanic eruptions.

A GLOBAL WEATHER EXPERIMENT, part of the World Meteorological Organization's Global Atmospheric Research Program, recently ended its year-long operation and special efforts in the southern hemisphere are reaping rewards for Australia.

Parts of north and northwest Australia are regularly ravaged by cyclones (indeed, cyclone survival training is a matter of course in some schools). Now new information has resulted in more accurate tracking of cyclones. In the more southern latitudes, information has resulted in improved forecasts of weather conditions applicable to shipping and farming, said Minister for Science and the Environment Senator J.J. Webster.

The Australian Bureau of Meteorology launched 47 buoys in surrounding oceans at a cost of \$350,000. Australia also installed aircraft-to-satellite data relay units—in five Qantas aircraft, and one of two tropical wind observation ships was the Australian Navy's oceanographic ship, the HMAS Diamantina.

The Save-the-Mediterranean plan's in danger—no funds

BARCELONA—Leaders of the five-year-old Mediterranean Action Plan have warned, in no uncertain terms, that the Plan and its staff will have to be "immediately and dramatically" curtailed unless participating nations make good their pledges of financial aid given last February.

Peter Thacher, deputy executive director of the United Nations Environment Program, told Mediterranean officials attending a three-day meeting in Barcelona Feb. 11-13 that a decision on cutbacks would be made by the end of March. He disclosed that nations involved in the Plan have to date contributed only \$1.5 million of the \$3.2 million pledged for the Plan's 1980 budget.

At that pledging meeting in Geneva, it had been decided that interested nations would contribute 50 percent of the cost of the Action Plan.

Thacher also told delegates in Barcelona that the Blue Plan, a theoretical study of the Mediterranean in the year 2000, would not begin this month as hoped and might even be ditched unless governments showed greater interest in supporting it.

"We are persuaded many of you are not interested in the Blue Plan," he said, referring both to lack of cash and of expert aid.

At the same time, UNEP officials announced that a treaty on land-based pollutants, the first concrete result of the Action Plan, will be signed in Athens May 12-17. The signing had originally been scheduled for July. An intergovernmental meeting on specially protected areas of the Mediterranean was scheduled for Sept. 22-26, also in Athens.

Thacher, opening the Barcelona conference on a hard-hitting note, told 13 delegations attending the initial session that eight of the 18 Mediterranean nations had failed to make any contribution to the Action Plan by the recently expired 12-month deadline. He said these nations included two of the big three—Italy and conference host Spain.

Both nations, citing problems of approving national budgets, said their respective contributions—\$744,000 dollars and \$412,000—would be forthcoming in a few months.

Although France, the third of the big three, has paid slightly under \$1 million, Thacher said, it is still half a million dollars short of its pledged contribution. France promised to send the final third of its payment "soon."

Thacher expressed regret that only five nations—Tunisia, Algeria, Cyprus, Malta and Greece—had paid their contributions in full, while France, Israel, Morocco and Libya had made part-payment.

"We have received only 35 percent of what is required," Thacher said. "Without a dramatic increase in cash contributions we have today only seven weeks remaining before we must stop a number of ongoing activities." He did not say which activities would be affected in a first cutback.

Malta suggested that in the future Mediterranean governments make budgetary requests a year ahead of deadline. A preliminary estimate of the 1981 budget is \$4.5 million.

Mohamed Tangi, secretary general of the conference, warned that "Mediterranean nations must choose between paying the price of a healthy Mediterranean or letting the sea go on getting polluted and paying to re-build the health of their citizens.

"Although the Mediterranean as a whole will probably take a long while still to die, this forecast, which some people call exaggerated, is already a fact in certain areas. If we do not take urgent steps," Tangi concluded, "these areas will spread to cover

large regions of the Mediterranean."

Good news at the meeting was that Algeria announced it had ratified the 1976 Barcelona Treaties which deal with dumping land wastes in the sea and cooperating in the event of major oil spills. This brought the number of ratifying states to 16 (out of 18) plus the EEC.

JULIE FLINT

Italy has a new environmental coordination committee

ROME—A new governmental committee was formed here in lanuary to coordinate environmental policies in Italy.

The new Inter-Ministries Committee for the Protection of the Environment (CIPA) includes 15 ministers. Vito Scalia, minister for the coordination of scientific research is chairman, a proxy for Premier Francesco Cossiga. Its general secretary is Gianfranco Merli, whose name is tied to a long battle in parliament for Italy's first water protection law.

CIPA will make sure that all government departments follow common lines in their environmental protection measures. It will also promote international cooperation and the fulfillment of relevent directives from the executive Commission of the Euro-

pean Community.

An agenda for CIPA has yet to be drawn up. It will probably place priority on updating the air protection law, now 14 years old, and fully enforcing the water protection law of 1976, slowed by investment problems. Priorities could also cover wildlife, national parks, soil erosion and decaying monuments. It is expected that CIPA will also produce a much-needed yearly report on the state of the environment. The first (and so far only) such report was published in 1973. The initiative was discontinued because of political dissension.

CIPA chairman Scalia told the Rome daily Il Messaggero that the committee plans to analyze the environmental impact of noxious chemicals. And, he said, an environmental data bank will be established.

Scalia also is presiding for six months over the Council of Environment Ministers of the European Community.

The country's major environmental association "Italia Nostra" (Our Italy) welcomed CIPA as "a sign of awareness of the need to overcome contradictory and sectional measures."

An anti-nuclear association, Kronos 1991, is afraid that CIPA will be used to overcome opposition by concerned communities to the siting of new nuclear plants. Scalia dismissed this fear by saying that other boards are in charge of nuclear choices. He did not elaborate.

VITTORIO PESCIALLO

In Europe...

"ENVITEC '80," the third international environmental protection exhibit, held in Duesseldorf, West Germany, between February 11 and 15, was the biggest to date. Exhibit space covered 24,000 square meters, 50 percent more than the first exhibit, held in 1973. Four hundred and fifty-four exhibitors from 16 countries displayed their products, and 28,500 trade specialists came to inspect them.

The exhibit made it clear that technology is indeed coping with old and new environmental problems, even anticipating some that have not yet become bothersome. What is less appreciated is that the industry dealing with problems of pollution has developed into an important branch of the economies of all industrialized countries.

SPAIN has its first popular environmental magazine, El Ecologista, a monthly publication "about everyone, for everyone and by everyone."

The 100-peseta (\$1.60) monthly, whose title page carries the unusual "we recommend that all articles in this magazine be re-printed," is produced by a group of amateur and professional ecologists and ecological organizations.

Its founder members, who all contributed equal amounts of money toward its launch, include Basque anti-nuclear groups and regional pressure groups ranging from the Canary Islands off the coast of Africa to Galicia in northern Spain.

Its address: Calle Segovia 24, Madrid 5, Spain.

TURIN, the Italian auto capital, is the only municipality in the country with mobile anti-pollution squads to quickly identify and sue firms threatening the environment.

"We chiefly operate over the weekends, a favorite period for the illegal discharge of polluting substances," explained Teobaldo Fenoglio, the city ecologic assessor who trained 20 squads. "Timely calls by citizens are a major help in our efforts."

Fenoglio said his squads pick up samples of polluted water and check pollution of air "even at Christmas if necessary. Our interventions must be timely, otherwise the source of pollution can be hardly traced.

"We get up to twenty calls a day, which result in 70 suits in a month. All Italian cities should have this sort of flying service to better fight pollution."

At present pollution is punished with light fines. However, a law debated in parliament is going to make punishments stiffer in the short term.

Down under ...

PAPUA NEW GUINEA'S new Energy Development Company, a government agency attempting to develop fuel resources, will be the major owner of the country's first alcohol project. The aim is to be 30 percent self-sufficient in road transport fuels within this decade.

The project at Baiyer River in the Western Highlands relies on reaping cassava plants to produce 2 million liters of ethanol each year when full production starts in 1981.

ETHANOL produced from sugar cane in Western Australia's ambitious Ord River project could provide 10 percent of that state's fuel requirements.

The state Minister for Agriculture, Richard C. Old, said he is studying the feasibility of establishing an ethanol-producing industry in the Ord

The Ord—Australia's dream project of making flowers bloom in the arid Kimberley region—was pronounced a failure by a federal-state committee after 20 years and \$100 million had been poured into it (WER, July 16, 1979, p. 7). Funding, however, continues.

IN AN INGENIOUS EXPERIMENT which has solved one company's waste disposal problems and resulted in energy savings for another, grain dust is being burned in an Australian power station.

Three firing trials have been conducted at the South Fremantle power station in Western Australia, in which grain dust from the loading facilities of a grain distributor has been mixed with coal in the State Energy Commission's (SEC) station. The dust has the same specific energy as coal from one of the state's gargantuan coal fields.

The firing could save the SEC as much as \$77,000 on its annual fuel bill. The saving isn't large: the Commission's total fuel and fuel-handling bill in 1978 was \$66.7 million.

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Vietnam vets sue Australia over using defoliants in war

PERTH—What may be the most notorious legal battle in Australian history—a battle against the federal government—is building up as this country's veterans of the Vietnam war gather evidence that chemicals used in warfare have resulted in birth defects in their children.

The culprit, claim the veterans, is Agent Orange—a defoliant used to destroy foliage in areas believed occupied by Viet Cong. Agent Orange is a 50-50 mixture of the herbicides 2,4-D and 2,4,5-T (which the Australian government claims is safe despite disquieting studies in the United States).

Concern among the Australian ex-servicemen about birth defects in their children mounted recently when a statistical study was completed showing that of 50 veterans examined, one in four had fathered children suffering from birth defects. The national average here is one in 1,000. Birth defects among these children included missing fingers, club feet, deformed legs and cases of deafness.

Now 19 veterans have made compensation claims and at least 40 are preparing disability claims. Several hundred have formed the Vietnam Veterans' Action Association, and they have placed advertisements in national newspapers asking other veterans to provide details of illnesses possibly related to Agent Orange.

A by-product of 2,4,5-T is the dioxin TCDD. In Agent Orange the dioxin element was up to 5000 times higher than the level permitted in the 2,4,5-T used agriculturally in Australia.

The Australian government has countered the mounting accusations with an announcement of an inquiry into Agent Orange. A study is to be conducted by the school of public health and tropical medicine at Sydney University.

Minister for Veterans Affairs Albert Aldermann has refuted claims of a government whitewash. He told the Australian veterans and Defence Services Council in Sydney that his department has been monitoring the development of Agent Orange since 1978 and had kept in close touch with U.S. authorities. One study of U.S. veterans revealed a similar incidence of birth defects.

"No evidence has emerged which indicates a relationship between these herbicides and specific long-term disabilities" other than chloracne, a skin complaint, said Mr. Aldermann.

This is not the first time 2,4,5-T has come under fire in Australia, but in June, 1979, the National Health and Medical Research Council, Australia's chief medical advisory body, gave the herbicide a clean bill of health. New Zealand also stated at the same time that safeguards on the use of 2,4,5-T were adequate.

JANE NACZYNSKY-PHILLIPS



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PREVIEW of a major study on tropical forest depletion

NAIROBI—Present projections indicate that tropical moist forests may be exploited to exhaustion within another half century at most—about the length of time left for earth's known stocks of oil deposits. It is difficult to envisage which event will have the greatest impact on society's eventual well-being.

Exploitation patterns are highly differentiated. Appreciable parts of the biome are undergoing depletion faster than had been supposed, while certain limited sectors are probably undergoing little change. Virtually all lowland forests of the Philippines and Peninsular Malaysia seem likely to become logged over by 1990 at the latest, and much the same applies to most parts of West Africa. Little could remain of Central America's forests within another ten years, due primarily to cattle ranching. Almost all of Indonesia's lowland forests have been scheduled for timber exploitation by the year 2000, and at least half by 1990. Extensive areas of Amazonia in Colombia and Peru could be claimed for cattle ranching and various forms of cultivator settlement by the end of the century, and something similar holds good for much of the eastern sector of Brazil's Amazonia.





By contrast, Central Africa features low human densities and abundant mineral resources. This reduces the incentive to liquidate "forest capital" in order to supply funding for various forms of economic development. Hence there could well remain large expanses of little disturbed forest in Central Africa by the end of the century. Similarly the western sector of Brazil's Amazonia, because of its remoteness and humid climate, could undergo only moderate change. In short, the overall outcome is likely to be extremely "patchy," both in terms of geographic areas and degree of conversion—the latter ranging from marginal modification to fundamental transformation.

Forestry...

DIEBACK DISEASE has now destroyed much of the limited jarrah tree forests of Western Australia. More than 195,000 hectares of state forest have been affected by the disease which rots feeder roots (WER, July 16, 1979, p. 7).

The state's Forests Department has called on farmers in the southwest of the state to help out in a 30-year, \$60 million replanting of the damaged areas. The share-farming scheme calls for 60,000 hectares of poor-quality jarrah forest to be replanted with pine.

In the first step, farmers will seed and farm clover in new pine plantation areas (clover fixes nitrogen in the soil to enrich it).

About 1700 hectares of pine will be planted in 1980, and a further 2000 hectares in 1981.

"MARA" TIMBER (Switenia macrophilia) in Bolivia may totally disappear in less than 10 years if current irrational exploitation trends are not arrested, said a Ministry of Agriculture report on the country's forest resources.

Bolivia has 50 million hectares of forests, of which at least 40 percent is exploitable for industrial use. From that total, 5 percent is "mara." But, according to the report, unless the government undertakes severe measures, "mara" is threatened with extinction. The report suggests "drastic reduction" in export permissions of "mara."

CHINA'S DAXINGGOU FOREST BUREAU in northeasterly Jilin province has proven the benefits of good management since its establishment in 1960. From a forest area of 143,700 hectares, 2 million cubic meters of timber have been harvested, yet timber reserves—7.5 million cubic meters, 19 years ago—have expanded to 9.29 million cubic meters today. Han Mingshun, director of the bureau said that the policy is a simple one: plant new trees while cutting the mature ones.

Only mature or below-grade trees are cropped while younger, healthier trees are left to grow.

The bureau has put great effort into reforesting bare mountains and land already stripped. Since 1960, over 22,000 hectares have been reforested.

In 1976, the bureau started seedling experiments in greenhouses using an open ended plastic tube as a container. This method shortens the raising period, prevents transplanting shock to the plant and increases the survival rate. The bureau now has 12 forest farms.

The most recent figure for "depletion per minute" (based on Myers' NAS survey) is somewhere between 40 and 50 hectares—twice the rate previously proposed. True, in many areas the primary forest will have been converted to secondary forest and will thereby remain a forest, albeit of a severely impoverished sort—and thus there is validity to a recent FAO report to the effect that total elimination of forest cover amounts to only 10-12 hectares per minute. But these figures are no more than "best judgment estimates."

To date, we simply do not have comprehensive and systematically assembled data on all parts of the biome. The advent of remote-sensing surveys should enable us to get a secure grip on the size and scope of the overall problem through statistical information coming on stream from several major countries of the biome during the course of 1980. In the case of virtually every country that has already completed remote-sensing surveys, Landsat imagery indicates that forest conversion is much more extensive than had been thought. For example, the Philippines possesses only 38 percent forest cover, as compared with former estimates of 57 percent; Thailand possesses only 25 percent, as compared with 48 percent.

The largest single factor in the conversion of tropical moist forests lies with forest farmers of various sorts. Often known as shifting cultivators, these farmers are becoming less able to practice the rotational agriculture that often constituted sustainable use of forest territories in the past. Due to increase in their numbers, these farmers now make intensive as well as extensive use of forest environments, with the effect that local ecosystems can no longer recover quickly enough. In addition, these traditional farmers are now being joined by large communities of subsistence peasants, who, due to lack of land elsewhere, are moving into forests where they adopt a slash-and-burn style of agriculture that leaves little scope for forest regeneration.

These forest farmers have been estimated in the mid-1970s to total at least 140 million persons, or roughly 20 million families. If each family clears one hectare per year (or otherwise contributes to forest depletion, e.g. through wildcat fires), this means they are accounting for some 200,000 square kilometers of forest each year. True, many exploit secondary forests; and in some sectors of primary forest, e.g. in Zaire, population densities may still be low enough to permit sustainable use of the forest with the prospect of eventual regeneration of primary vegetation. But a number of recent studies suggest that forest farmers are annually converting at least 100,000 square kilometers of primary forest to permanent cultivation—or at least to permanent vegetation cover other than primary forest.

Moreover, population growth rates in many countries with tropical moist forests are among the highest on earth. Unless economic development proceeds at a faster pace, thereby opening up opportunities for alternative forms of earning a living, it is possible that a large proportion of the population increase in these countries will cause the numbers of forest farmers to grow disproportionately. In other words, while overall population growth in the countries concerned may increase 60-70 percent by the year 2000, the numbers of forest farmers could at least double.

By contrast with this dismal prognosis, it is illuminating to reflect on an initiative of the newly elected President of Brazil, who has called upon all sectors of the community—professional foresters, development technocrats, commercial interests, economist planners, land-use experts, investment bodies, scientists and other academics, wildlife supporters, citizen groups, and whoever else can make a substantive contribution—to offer their views on a new policy for development of Amazonia. At the conclusion of this public debate, the findings and recommendations will be presented to the Brazilian Congress, which will formulate fresh legislation for future development of Amazonia.

NORMAN MYERS

This brief review is based upon a survey conducted by Dr. Myers for the National Academy of Sciences during 1978 and 1979. A report, "Conversion Rates in Tropical Moist Forests," is to be published April 1, 1980, by the National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C. 20418, Att: Dr. James Talbot.

An energy-efficient cookstove makes its debut in Kenya



NAIROBI—A simple-looking portable stove just demonstrated here could help halt the alarming destruction of tropical forests. Like the traditional cooking stoves now used throughout Kenya and in many other African countries, it burns charcoal—but it provides more than three times the effective heating energy for each pound of charcoal burnt.

Prince Sadruddin Aga Khan, the former UN High Commissioner for Refugees, is president of the Geneva-based Bellerive Foundation for Primary and Renewable Energy, which produced the new charcoal stove. It was designed by Polish-born scientist Waclaw Micuta after Micuta had visited Kenya to study the problem.

Many African forests are threatened by the increasing demand for wood fuel, including charcoal. If the new stove catches on, it could reduce the demand drastically, Kenyan officials said.

Kenya's newly appointed Energy Minister, Dr. Munyua Waiyaki, is enthusiastic, and the Kenya government is backing plans to get local small-scale manufacturers of charcoal stoves to switch to the new design. Like the existing traditional Kenyan stove, known as the jiko, it is portable, and accommodates a single cooking pot.

For further information, contact the Bellerive Foundation at Chateau de Bellerive, 1245 Collonge, Bellerive, Switzerland.

CHARLES HARRISON

New Fuels ...

IRELAND says it will become the first European country to have a power station with a specially-constructed biomass-burning plant.

Plans for its installation are at an advanced stage. It will be run by the Irish Electricity Supply Board for Bellacoric in remote County Mayo on the Irish west coast.

One thousand acres of local bogland will be planted with fast-growing trees to fuel the

The E.S.B. has already conducted several successful biomass tests at its Cahirciveen station in County Kerry. The installation of this burner in a specially-constructed plant attached to the existing power station at Bellacoric would be the first time this has been attempted in Europe, and other nations reportedly are watching the project closely.

A PROJECT IN THAILAND to construct garbage-fueled power plants, shelved for more than seven years, will be reconsidered in light of the present energy shortage, National Energy Authority (NEA) Secretary-General Pravit Ruyaporn said. He said the project has been revised with the help of a team of French experts. If implemented, it could save fuel oil as well as solve the problem of insufficient garbage dumping areas.

GUANGDONG PROVINCE IN CHINA in the past two years has built 32 power projects with a total generating capacity of 33,000 kilowatts using exhaust heat. If all the waste heat of the industrial enterprises in the province were utilized, an equivalent of one million tons of coal could be saved each year.

IN NEW SOUTH WALES, Australia, the Department of Agriculture will build a pilot plant to see whether farmers can produce their own ethanol. The plant will be built at the department's Agriculture and Engineering Center in Glenfield, south of Sydney.

If the experiment proves practicable, farmers could end up producing crops to feed their own ethanol production units by the end of the 1980s.

Less than a week after this announcement, the federal government removed the duty from ethanol when used in farming and transport fuels. In some parts of Queensland, gasoline blends have used up to 15 percent ethanol, which is made from various sugar crops including wheat, sugar cane, and sugar beet.

The amending legislation is to pass through Parliament in the session beginning February.

In Europe...

POLAND'S SEJM (Parliament) passed an environmental protection bill at the beginning of February, and it automatically became a binding law.

The bill was under discussion for several years by experts and the general public.

Generally, the Ministry for Administration and Environment will have overall supervision. The Ministry will also create a State Environment Protection Inspectorate to watch over implementation.

Rules and regulations provide in detail how local administration is to safeguard the environment, how industry is to construct preventive measures against pollution, etc. The executive order providing these rules in detail is expected shortly.

THE POLISH METEOROLOGICAL INSTITUTE has begun to research the circulation of waters in the Baltic Sea. The models take into consideration not only Baltic waters but also the North Sea, which adjoins it, as the Baltic reacts up to 20 days on the intake of North Sea water.

The research will have an impact on environment and pollution protection, the institute's communique said, and will greatly help fishermen. Detailed information will enable meteorologists and naturalists to prepare precise prognoses to determine the degree of exchange of water and its self-purification.

THE AZORES, a chain of nine volcanic islands in the mid-Atlantic belonging to Portugal, expects geothermal energy may replace imported oil.

Prospecting began in 1977 and subsequent drilling to 100 meter depths struck geothermal resources of 250 degrees centigrade.

The first pilot generator plant on the island of S. Miguel is being installed by the Japanese firm Mitsubishi. It will produce 3 megawatts, will start up within the next few months, and may be forerunner to a 15 mw plant.

The regional government has spent over Esc 500 million (\$10 million) on energy exploration and will soon start prospecting on the other islands. The hope is to eventually become self-sufficient in energy.

ILLEGAL ROADSIDE DUMPING has become a major problem in Ireland but at Kildare the National Stud, which is responsible for development of the Irish horse industry, has found a novel way of foiling the litterer.

When rubbish is thrown over the boundary fences onto their property it is examined and, where addresses are found on correspondence, it is all gathered up and returned to the doorsteps of the identified dumpers.

Britain's first waste-fuel plant is a money saver

LONDON—After nearly two years of testing and development, Britain has its first fully operational Waste Derived Fuel (WDF) plant in the Sussex seaside town of Eastbourne. Resulting from a partnership between local government and private enterprise (the East Sussex County Council and the firms of Buhler Miag [England] and Asthall Holdings) the new WDF plant produces up to 30 tons of half-inch fuel pellets a day from the town's 25,000 tons of yearly waste.

From a process of classification, pulverization and densification, pellets of combustible materials are produced for burning in industrial boilers as a back-up fuel for coal. The volume of waste left for landfill is reduced by up to 75 percent, thus cutting transport costs and extending the life of the landfill site. The East Sussex County Council estimates savings of up to £37,500 (\$82,000) a year.

Finance for the project was provided by the International Energy Bank, which is now collaborating with Asthall Holdings in setting up similar projects in other parts of the country.

BARBARA MASSAM

Nuclear resistance in Britain becoming better organized

LONDON—Anti-nuclear resistance in Britain is becoming more vocal and better organized.

Government endorsement for the Central Electricity Generating Board's controversial £10 billion (\$28 billion) plan to build 10 nuclear power stations at the rate of one a year from 1982, was announced in December and has already been widely criticized and debated.

Some Members of Parliament are pressing for a House of Commons debate on the country's nuclear future. Most ecological, pacifist and anti-nuclear groups have joined together in an Anti-Nuclear Campaign, the broadest alliance so far in the environmental movement. There are two notable exceptions—Friends of the Earth, who believe the campaign too political and left-wing, and Greenpeace, who think flexible, local action has more effect. However, all groups have called upon their supporters to prepare for a prolonged fight—a few hinting at militant action in the European style, many more suggesting civil disobedience.

The government and nuclear industry are convinced nuclear power offers the safest, most practical and cheapest means of satisfying the country's future energy needs. They have promised a public enquiry and national debate on the whole issue.

Opposers want the debate widened to include reexamination of future energy needs. They accuse the nuclear industry and the electricity board of secrecy about safety records of the various reactors. They are worried about the proliferation of nuclear



weapons resulting from domestic expansion, about nuclear waste disposal and about transportation around the country of spent radioactive fuel heading for reprocessing at Windscale plant. This

In spite of its determination, spearheaded by the prime minister, Mrs. Thatcher, it seems the government does fear confrontation. A leak in Cabinet minutes, published by the London magazine "Time Out" suggested that the government thought it best to keep "a low profile" about its nuclear plans.

Meanwhile anti-nuclear campaigners believe that viable alternatives exist in a mix of soft energy options. The softest of all was proposed by Trevor Brown of the Atomic Weapons Research Establishment at Aldermarston. He says that thatch a foot thick on every roof in Britain would save more electricity than atomic energy has generated.

BARBARA MASSAM

Denmark postpones a decision on building nuclear plants

COPENHAGEN—The introduction of nuclear power to Denmark has been delayed indefinitely—because of uncertainty over safety.

Prime Minister Anker Joergensen said the government had not entirely given up the idea of using nuclear power. But he added that security problems—such as the disposal of atomic wastes—could not be solved in time for his government to make its promised decision in 1981.

Two inhibiting factors were that Denmark is so small it would be hard to find suitable plant sites far enough away from inhabited areas and that disposal in such a flat country was impossible with complete safety.

The prime minister did not mention it, but a third factor was the enormous expense of nuclear power plants for a country already burdened with an excessive balance of payments problem.

In any case the first nuclear plant could not be ready before 1990.

Joergensen said that the government would have to concentrate on finding other alternatives to imported oil. Coal, imported from Poland and South Africa, would have to provide a bigger share of the country's energy. Joergensen said he was aware of the pollution caused by coal burning but, he said, there was no other choice at present if oil consumption was to be held down.

Energy Minister Poul Nielson has expressed hopes for more North Sea gas as an alternative to oil. But Denmark's exploitation of its North Sea reserves has progressed slowly compared with the successes of Norway and Britain.

So Danish leaders are advocating pooling Norway's ample natural gas supplies between Sweden, Denmark and perhaps West Germany (Denmark's more modest supplies would be included).

Although the energy question has been discussed by Joergensen and Norwegian prime minister Odvar Nordli, Norway's petroleum energy minister, Bjartmar Gjerde, said talks about possible energy cooperation with Denmark cannot begin until the end of this year or early 1981.

CONSTANCE CORK

More on Europe ...

A CANADIAN COMPANY, Anglo-United, has begun drilling for uranium in Donegal, Ireland.

It plans additional drilling on "very promising targets," but its plans have given rise to opposition led by an organization called the Belfast Anti-Nuclear Movement, from a hundred miles away in Northern Ireland. They sent a group into County Donegal and began public meetings, resulting in local people setting up a Uranium Watchdog Committee which is organizing a two-day seminar with environmental experts to discuss the situation.

Anglo-United is Toronto-based but operates in the Irish Republic through a subsidiary, Munster Base Metals (MBM). It has about 50 prospecting licenses in different areas in the country.

WEST GERMANY'S ruling Social Democratic Party recently voted to maintain the option of using nuclear energy, beating off attempted amendments from its left and youth wings that called for a phase-out of nuclear power.

The delegates approved by a show of hands a carefully worded resolution stating that the possibility of using or expanding nuclear energy could not now be dispensed with. It also provided that new nuclear power plants could be constructed or put into operation as progress was made towards final deposit of the radioactive wastes.

BAVARIAN STATE PREMIER Franz-Josef Strauss said he will ask Federal Chancellor Helmut Schmidt to once again request that Czechoslovakia reduce air pollution from the industrial area in northern Bohemia.

Strauss said complaints had been increasing over the pollution and stench believed to come from Sokolov, a large chemical center about 15 kilometers from the border.

HELMUT KOHL, chairman of Germany's opposition Christian Democratic Party (CDU), has made public his party's program for protecting and improving the environment. Instead of more laws, regulations and inspections by government officials, Kohl called for greater reliance on the "polluter pays" principle, and on the ingenuity of modern technology to find solutions for environmental problems. What is required, he said, is for government agencies to establish realistic goals for the control of pollution and then leave to industry and local communities the means of attaining them.

In Latin America ...

BOLIVIAN OFFICIALS are investigating where the money is from timber exports to Brazil. It seems nearly \$1 million is "missing."

A Supreme Decree authorizing timber exports decided that 30 percent of revenues were to benefit the Armed Forces to build up garrisons in areas bordering Brazil. The remaining 70 percent was to be invested in reforestation and economic development in timberproducing areas. But since none of the revenues was given to the producing areas, there have been mounting protests against timber exploitation, forcing the government to investigate the

THE SOLUTION to Mexico City's environmental problems may get a big push. President Jose Lopez Portillo's wife announced she will direct the national cultural fund toward combatting environmental contamination. Mrs. Carmen Romano de Lopez Portillo, chairman of the National Fund for Social Activities, said the fund's efforts will be to educate the public in environmental matters. Last year, the fund presented more than 7,000 cultural events in all parts of the city. Now, the manpower that produced these events will focus its attention on the environment with the considerable help and influence of the president's wife.

THE 1980 BUDGET for Venezuela's Environment Ministry, approved by Congress, stands at some \$415 million, an increase of more than 35

percent over the previous year.

The extra money will go to the Water Works Institute (INOS) which did not receive its funds from Environment last year. There is an acute water shortage, especially in Caracas, and providing water is now a top priority on the government list of services.

Second on the Ministry's list is IMAU, Caracas' garbage collection department, and the Parks Institute is next.

VENEZUELA'S National Canalization Institute (INC) has announced a program to install 180 solar-powered buoys this year in Lake Maracaibo to mark the navigation channel. The present buoys operate with gas cylinders; solar buoys use cells with a life expectancy of between 10 and 20 years. If the solar buoys prove effective, INC plans to install them also on the Orinoco River.

"Venezuela is one of the countries where solar energy is cheapest in the world," said a Venezuelan solar energy expert. "A kilowatt costs 55 cents to produce here, while in temperate climates, such as Europe and the USA, it costs \$3.25.'

Caribbean Action Plan aims at environmental management

CARACAS—Experts from the Caribbean region and from nations with territorial interests in the area met here recently to take a hard look at the Draft Action Plan for the Wider Caribbean Region

(WER, Aug. 27, 1979, p. 1).

There was unanimous agreement that an action plan was desirable and considerable agreement on the draft plan itself, but the environmental assessment and management portions of the draft were rewritten. There was less consensus on the administrative and financial measures necessary to carry it out. A proposal for a trust fund, similar to that of the Mediterranean Action Plan, was temporarily shelved because there were differences on how it should be effected. It was put off till a later date so that the participating governments could comment.

The emphasis of this plan, unlike that of the Mediterranean which is a clean-up plan, is on environmentally sound development. A great deal of work went into reshaping the assessment section. There should be no data gathering or monitoring unless it is tied to an environmental management goal. The UN Environment Program and Economic Commission for Latin America, coordinators of the plan, are to come up with specific action proposals within the strategy by June. A senior-level meeting to approve the action plan, originally scheduled for May, was rescheduled for the Fall, probably September.

Mexico and the U.S. agree to keep their shared seas clean

MEXICO CITY—A mutual agreement to keep their shared seas clean has been reached by Mexico and the U.S. The "mutual contingency plan" is a direct result of the 1xtoc-1 accident last June 3 in which an offshore Mexican well exploded and for months poured oil into the Gulf of Mexico.

Talks between marine anti-contamination specialists of the two countries began in 1976 but came to nothing. After the Ixtoc-1 accident, talks were re-initiated, explained Miguel Garcia Lara, chief of environmental protection for Pemex, the Mexican oil

monopoly.

The plan is to combat contamination by hydrocarbons and other toxic substances. It provides for exchanging information, guaranteeing mutual help and establishing contingency plans for whatever may occur.

Both nations agree to develop systems, within their capabilities, to detect actual or imminent problems, to take steps to eliminate the threat, and to reduce to a minimum any adverse effects on the

seas and on public health and well-being.

The agreement will be in force for five years with automatic renewal if neither side objects. Each country has the obligation to consent to assistance before assistance is given, but assistance will' be available. KATHERINE HATCH



Bombay is India's most Western city, and its most polluted

BOMBAY—This is India's commercial and industrial center, the most Westernized and orderly of the country's four major cities—and the most polluted.

Two areas of mid-town Bombay are particularly polluted: Chembur-Trombay and Lalbaug-Parel. The former has to contend with a massive fertilizer complex, which has just been expanded, bang in the middle of a purely residential complex. The plant is run by the government-owned Fertilizer Corporation of India, which insists it has taken corrective steps to check emissions of sulphur dioxide, carbon monoxide and other noxious gases, although the residents of Chembur tell a different story.

According to environment experts, of the 300 tons of sulphur dioxide released by industries in Bombay every day, as many as 190 tons are in Chembur-Trombay, where the two major oil refineries are also situated. Not surprisingly, residents refer to the area as "Gas Chembur!"

Another major polluter there is a thermal power plant owned by the Tatas, India's top industrialists. This too, is about to be expanded—with World Bank aid. The thermal plant will then use natural gas from the Bombay High off-shore project, but it may have to switch back to coal when the gas runs out.

The adjoining area of Lalbaug-Parel is older. The cotton mills, which were the mainstay of the city a century ago, are crowded in there. So is the Bombay Gas Company that supplies cooking gas to homes and carbon particulates into the atmosphere. Last year, Dr. S.R. Kamat of the prestigious K.E.M. Hospital studied health records of 4,000 residents. They showed, for instance, that the incidence of TB was extremely high. Together with carbon particles and cotton fiber, the emissions were equivalent to compelling a newborn infant to smoke 30 cigarettes a day.

The laws governing contamination of the air here are by no means stringent. Industries are occasionally fined. Even the state-owned Fertilizer Corporation of India, which came under fierce attack by bodies like SOCLEEN (Society for Clean Environment), refuses to acknowledge that its giant plant has endangered the health of citizens. It has lengthened its smoke stacks and will install antipollution devices like electro-static precipitators in the fifth phase of its expansion plans.

One solution, which the Maharashtra state government is planning for Bombay is to freeze all expansion by other industries so as to encourage plants to be set up outside the city limits. Till now, this carrot-and-stick policy has hardly worked. The very fact that the fertilizer plant and thermal stations are being permitted to grow speaks for itself.

DARRYL D'MONTE

Environmental health...

OFFICIALS FROM 17 WESTERN PACIFIC nations participated in a recent seminar on emergency assistance in environmental health.

A World Health Organization spokesman said that the Manila seminar discussed planning for emergency procedures in human settlements for water supply, waste disposal, insect control and food sanitation during natural disasters. Also considered were contingency plans during air and water pollution incidents as well as protection against environmental hazards from accidental spills of toxic and hazardous substances.

ENVIRONMENTAL HEALTH OFFICERS may be employed all over Europe someday.

Experts from eleven European countries met in the Regional Office for Europe of the World Health Organization, in Copenhagen, and concluded: "Industrial society needs such officers. They can play an important role in preventing the health hazards of the increasingly complex industrial society of today."

They noted that traditional sanitation problems have given way to new health hazards and an environmental health officer would be a general practitioner in the service of the community. But such officers must be supported by strong legislation to make their rulings capable of enforcement and adaptable to local circumstances.

A VENEZUELAN FOUNDATION for the development of science and technology was set up recently in Zulia State with the support of President Luis Herrera Campins. Institutions receiving help from the foundation must work for human and social development in the areas of health, environment and public services as well as natural resources, agriculture, energy and industry.

The foundation is funded by the Presidency of the Republic, CORPOZULIA, CONICIT and other private and public bodies of the western region.

AUSTRALIA has banned the sale and import of children's toys coated with materials containing excessive levels of toxic arsenic, antimony, cadmium, chromium, lead, mercury, selenium and soluble compounds of barium. The ban was imposed because these toxic substances may pose health hazards for children.

In Asia..

A TEAM OF SCIENTISTS in Kunming, Yunnan Province, South China, claim to have produced a new type of silicon solar cell for much less than it costs to produce the cells in other countries. The new cell—described as a black solar cell with all nickel contacts—was made at the Physics Department of Kunming Teachers' Training College without the expensive vacuum apparatus used in the normal production of solar cells.

THE MALAYSIAN PARLIAMENT recently passed a National Parks Bill in which the government proposed setting up national parks in all the Malaysian states except in Sabah and Sarawak, which already have their own national parks administrations.

PROF. ROBERT JUNGK, a German-American author and futurologist, said recently in Tokyo that European experts were surprised that Japan had done little about alternative energy development and still clung to the model of large-scale growth technology that the West was moving away from. He said Japan was missing out on a vast potential market in the developing world by failing to develop simple small-scale solar energy technology.

THE HONG KONG government will recruit more technicians to help enforce anti-pollution laws coming into force this year, environmental officer Dr. Peter Kayes said recently.

According to Dr. Kayes, the new Air Pollution Control Bill will cover emissions from stationary sources as well as from mobile sources. The Environmental Protection Unit will establish five fixed monitoring sites to determine the concentrations of sulphur dioxide and particulate matter in the air.

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Mrs. Gandhi halts a project that's ecologically unsound

NEW DELHI—Within hours of becoming Prime Minister, Mrs. Indira Gandhi took on the Silent Valley project (WER, Sept. 10, 1979, p.6; Dec. 3, p. 3) and asked Kerala state leaders to stop work on it.

Ecologists had been waging a war for months against the state government's proposed hydro-electric project in the valley with its 50 million-year-old tropical rain forest.

Mrs. Gandhi's new federal government, committed to provide environmental protection and ecological balance, sent an emissary to ask the State Electricity Board to stop work on the project. Statutory directives were then issued by the Kerala government to stay all work on the Silent Valley hydro-electric project.

R. MURALI MANOHAR

Trade-off in Thailand: more crops vs. toxic pesticides

BANGKOK—Much of Thailand's industry depends on agriculture-based raw materials, like cotton. However, as pesticide use increases to ensure better yields, indiscriminate usage is causing increasingly high concentrations of toxic substances in locally produced foodstuffs. A recent survey indicated worrisome toxic levels in the soil, in vegetables and in fish.

Even so, official thinking is that application rates fall far short of what is required. Pesticide use in Thailand is much lower, in comparison, than in more scientifically advanced countries. Of the pesticides used in Thailand, insecticides account for 70 percent; fungicides and herbicides follow.

Complete figures on total crop loss are unavailable, making it difficult to quantify plant damage caused by weeds, insects and rodents. Those figures which are published are generally outdated and only reflect conditions in a relatively small segment of the agriculture sector. However, they do show some interesting facts, such as in 1976 some 1.6 million rai (2.56 million hectares) of the country's total maize producing area was ravaged by locusts.

Apart from high prices, constraints on pesticide use can be attributed to the following factors:

- A lack of knowledge among the majority of farmers concerning modern agricultural methods, a result of both insufficient learning opportunities and a negative attitude towards nontraditional techniques.
- Poor returns on crops, which means farmers are unable to invest much in pesticides.
- Market structure and long transportation distances greatly increase prices and limit the type of pesticide available on the local market.
- Lack of availability of proper equipment, and insufficient knowledge and skill for using it.

Thailand still has to achieve the level of pesticide use required for fully efficient crop production. But the course is beset with potential pitfalls that can result from indiscriminate and excessive pesticide use.

TONY OLIVER

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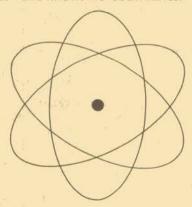
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West Germany protests fallout from East and West

BONN—West Germany is being invaded from East and West by forces that could destroy her environment and people. But so far the Germans have failed in all efforts to stop real and threatened encroachments on her territory, according to recent reports in the news magazine "Der Spiegel."

The first assault is chemical pollution from across the Rhine in France. There, plants emit high concentrations of sulphur fumes in the process of manufacturing fertilizers and synthetic fibers. Carried by prevailing westerly winds, the sulphur compounds come into contact with moisture in the air and are converted to sulphuric acid, which is carried to the ground with normal rain. Already some 5,260 hectares of conifer forest have suffered visible damage from the acid fallout. The regional forester reported nearly 1,100 hectares have been completely destroyed.

On three occasions since 1974, mayors of towns in the affected areas, where tourism is important, have been invited to conference-luncheons by the French plant operators to discuss the pollution problem. On each occasion they have reported favorably on the hospitality but only frustration over their hosts' promises to control the stack discharges. At their last meeting, in the summer of 1979, they were advised "not to interfere in the matter" and that "dirt knows no boundaries."



On its eastern border, West Germany faces a potentially more serious threat. It comes from the nuclear power construction program being carried out by East Germany and other East Bloc countries. At Lubmin, 140 miles east of Hamburg, three Russiandesigned nuclear plants are now in operation, with a fourth scheduled to start up later this year. An additional four are to be built at Magdeburg, 30 miles from the West German border, plus seventeen more in other East Bloc countries.

Environmental investments...

ON FEBRUARY 1st, at UN headquarters in New York, an environmental declaration was signed by some of the biggest development funders in the world. The declaration, drafted in Paris last Fall (WER, Oct. 8, 1979, p. 1) states these nine international lending institutions will make environmental measures an integral part of all their development projects-for which they lend tens of billions of dollars each year. As UNEP's Executive Director Mostafa K. Tolba said at the signing, "Unless environmental considerations are taken into account in any development project, it is doomed to failure...If the environment is overlooked, development is to no avail." All the signers emphasized that the declaration was a collective commitment to work together for the sustainability of develop-

Signatories were the Asian Development Bank, Arab Bank for Economic Development in Africa, Commission of the European Communities, Inter-American Development Bank, Organization of American States, UN Development Program, UN Environment Program and the World Bank. The African and Caribbean Development Banks were unable to sign because they had not received the final document in time to put it before their boards of directors, "but they are with us," said Tolba, "and will sign."

IN SWEDEN, funds for environmental protection in the Ministry of Agriculture's proposed budget have been reduced because of tough economic conditions ahead. Some 15.6 million crowns (\$3.8 million) were cut for a total budget of 366.7 million crowns (\$89 million) for the coming year.

THE BUSY SYDNEY-MELBOURNE RAILWAY link is to be electrified at a cost of \$330 million.

The electrification will provide 1500 jobs and the \$330 million cost includes basic electrification and new locomotives.

The Federal Cabinet has committed itself to a number of similar projects, requiring infrastructure loans, which involve utilizing the country's enormous coal resources. It has indicated support for coal-fired electricity stations—chiefly in New South Wales and Victoria, conversion from oil- to coal-fired power stations, and for several rail electrification projects.

Earlier, Queensland announced plans to electrify its entire railway network at a cost of \$274 million and major lines will be operating by 1985.

West Germany is strongly committed to the development of nuclear power and employs safety standards acknowledged as the strictest in the world. But the East German plants are being built without emergency core cooling systems or reinforced concrete containment vessels—the two features which prevented the Three Mile Island malfunction in the United States last March from contaminating the surrounding atmosphere. Further, the East Bloc plants are not designed to resist damage from earthquakes or falling airplanes.

Professor Jens Scheer, a Bremen physicist, says of the plants: "They are absolutely insufficiently equipped for a nuclear accident. They are like racing cars without brakes."

West German authorities have kept the question of the dangers before their East German counterparts, as have authorities from Denmark and Norway, both of which, in the event of a nuclear accident and a fresh east wind, would be as endangered as West Germany. But none of their objections has had any effect.

I.M. BRADLEY

Irish government agencies use alternatives to save energy

DUBLIN—Irish state-owned companies are making an impressive contribution to energy-saving, ranging from millions of pounds saved by the use of waste heat, through solar energy, to tidal power, biomass and biogas experiments.

The state companies showed their work to representatives of the nation's media on a two-day swing through the country.

One of the world's largest fertilizer factories, an ammonia/urea complex run by Nitrigin Eireann Teoranta (The Irish Nitrogen Board), is cutting fuel bills by £5 million (\$10.6 million) a year through a phenomenal rate of energy conservation by recovering heat generated in turning natural gas into ammonia.

The Irish Gas Board is cooperating with the Fiat Motor Company of Italy in an experiment to use low-powered car engines to run a power system called Totem which can produce electricity either from natural gas, hen droppings, pig manure or cattle slurry.

In Dublin, the Electricity Supply Board is researching solar power usage. Suburban houses have been fitted with panels and the staff swimming pool is being heated by a solar pump, saving £12,000 (\$25,400) a year on fuel bills.

On the Shannon Estuary in the Mid-West, the E.S.B. is researching tidal power to see if electricity can be generated from the Tarbert Race. The E.S.B. is also planning small hydro-electric power schemes and to use biomass to produce electricity, making local communities self-sufficient.

Meanwhile, University College, Cork, is conducting two unique experiments which could mean that Irish dairy farmers of the future will be able to milk their cows by electricity generated from the heat of the sun.

And at Fota Estate in Cork, the university is planning a mini-solar cell power station. The project will cover a quarter acre at Fota with five million solar cells, each one four inches in diameter. The National Board of Science and Technology, the E.S.B. and the university itself will put up £100,000 (\$212,000) to fund the program and they are seeking a European Community matching grant.

TOM MacSWEENEY

IMCO helping nations meet tanker cleanup deadline

LONDON—The Intergovernmental Maritime Consultative Organization (IMCO) has been "extremely busy" in the last 18 months, said its marine pollution adviser, Dr. Jon Wonham. It is helping major—and minor—maritime nations work to upgrade their systems for dealing with ballast and crude-oil washing.

By June of 1981 all existing tankers over 40,000 tons and new tankers of more than 20,000 tons must comply with the MARPOL (Maritime Pollution) Convention of 1973 and the SOLAS (Safety of Life at Sea) convention of 1978 (see WER, March 27, 1978, p. 4)

"More than 90 percent of tankers now conform to 'load-on-top' measures," said Dr. Wonham. "Certainly as far as pollution is concerned, these new requirements are a very big step forward.

"Really, the credibility of governments is at stake. In view of the public criticism that they have not moved fast enough in the past, I think they could get some criticism if they did not come up with the goods" by June 1981.

"The Convention says quite clearly that parties to it shall treat ships of non-parties in the same way that they would treat their own ships. In the past, a ship of a non-party nation simply didn't fall within the laws of the Convention, and they went around free to do whatever they liked. This new tendency toward state port control means that ships of non-parties which have not been adapted will not be allowed to trade with a party. This means that the developing countries have to take a very serious view of these developments."

Dr. Wonham said that only a small proportion of shipping is related to the developing countries, "but smaller ones do have a particular problem. For them, just the speed of technical development is very difficult to assimilate. They have to import the technology, and with small fleets just the cost of fitting new equipment and on-shore facilities for the discharge of slops can be extremely expensive."

IMCO is trying very hard through its advisory services to assist governments in moving faster to adopt the new rules. "I think you could not name a country which has not had the benefit of our advice," said Dr. Wonham. "Five years ago we had one regional maritime adviser. We now have about 19 advisers and experts, some of whom specialize in maritime legislation, administration and pollution. We also cover things like maritime training and ports."

About half of the 6 million tons of oil entering the seas each year is thought to come from ships or off-shore activities, and about one third of this comes from the routine operation of tankers, Dr. Wonham said. "Certainly, under these new amendments the problem for tankers over 20,000 tons should be eliminated completely.

"If there is a major obstacle to progress on pollution measures, it is the massiveness of the task. When you have hundreds of ships, millions of tons of shipping sailing under different flags and in the hands of private owners, it is a tremendous logistic task to get them to act together."

BARBARA MASSAM

Water wise...

VILLAGERS along the gulf coasts of four Mexican states will be closely watched over the next five years for signs of illnesses possibly caused by the 2-million-barrel oil spill from 1xtoc-1.

Investigators at the National Polytechnic Institute in Mexico City admit they do not yet know of specific environmental or human effects caused by the runaway oil well in the lower Gulf of Mexico, but they suspect problems may develop among humans who eat sea life from the gulf.

ANGUILLA, like many of its Caribbean neighbors, is seeing the need for protected marine parks.

The government is concerned about the possible depletion of coral reef fauna by commercial fishing and, accordingly, has prepared a draft policy statement and related legislation aimed at preserving reef fauna and preventing "serious conflicts between the fishing industry and tourism".

The Marine Parks plan is not intended to deprive a fisherman of a living; therefore, a certain degree of controlled fishing may be allowed.

The care, control and management of Anguilla's marine parks will be the responsibility of the Agricultural and Fisheries Officer who will, in turn, be responsible to the Ministries of Natural Resources and Tourism.

POLISH FISH BREEDING EXPERTS have invented a cheap energy-saving system for increasing oxygen in breeding pools. On an experimental basis, several windmills were constructed in a lake in southern Poland, near Tarnow. Using only wind energy, they pump compressed fresh air 10 feet under water.

A MEETING ON INTERNATIONAL RIVER commissions has been scheduled by the UN Economic Commission for Europe (ECE) for September 1-3 in Geneva. Its purpose is to discuss the role of these commissions in the integrated development of water resources in river basins. They will also discuss a draft Declaration of Policy on Prevention and Control of Water Pollution, including transboundary pollution. The ECE Water Committee, at a meeting last November, recommended it be adopted by member governments. It mandates that they adopt long-term policies to reduce existing water pollution and to prevent it in future. The declaration calls for improved legislation, integrated land-use planning, management incentives and developing low and non-waste technology.

In Europe...

DANES HAVE BEEN WARNED that the time is over when individual house owners could decide how to heat their homes.

The Ministry of Trade, which is responsible for planning energy resources, sent a letter to municipalities around the country saying that within 15 years one-third of all homes will be heated either by natural gas from the North Sea or by waste water from power stations.

The letter said national planners were authorized to prohibit some forms of household heating—obviously meaning oil—in new buildings if they did not conform to the general plan.

Already some communities north of Copenhagen have been advised that in future they will have to use natural gas while the inner suburb of Amager has been told that its needs can be met with the help of waste water from its power stations.

SKY-HIGH GASOLINE PRICES and powerful environmental pressures may bring an end to the autobahn era in West Germany. Just a decade ago, the German public considered these super-highways the very symbol of progress and freedom. But now Transport Minister Kurt Gscheidle has announced that all plans for building new, long autobahns will be abandoned. His program is not yet final, and it is running into opposition. But the government's publication "Focus on Germany" says "the betting is" that activity will be concentrated on finishing present projects, fixing the old and building just a few short stretches in urban areas. The money saved may be used for improving public transport.

FOUR MILLION TONS OF PEAT fuels are now harvested annually in Ireland. Peatland occupies 16 percent of Ireland, but development of this land did not start until 1946.

IRELAND'S STATE RESEARCH AGENCY says, after a three-year study, that 10 percent of the nation's electricity needs can be met by using wood fuel chips, and that it will cost considerably less than oil.

At their Oak Park Center in County Carlow the researchers hope to prove over the next four years that their concept, based on short rotation forestry, is a viable alternative energy source. They claim that a farmer could provide his own central heating by planting .8 of a hectare with trees for an initial outlay of £600 (\$1,300). Their project is being funded by a £250,000 EEC grant.

Britain's model wave-power device may be a winner

LONDON—A late but, by all accounts, a quality entrant into Britain's search for energy from wave power has come from a research team at Queen's University in Belfast, Northern Ireland.

A specially developed wave tank tested a scaled-down model; the team would now like to build a sea-going model of about one-tenth final size. A full-sized buoy would be about 30 meters wide and 36 meters across, weigh about 3,500 tons and cost an estimated £700,000 (\$1,596,000) to build, producing up to one megawatt of power when wave conditions were right. The team envisages lines of these buoys moored 90 meters apart about 18.5 kilometers from the shore.

The device consists of two vertical chambers, the lower one built of concrete and filled with water to float beneath the surface of the sea as a stabilizer. The top chamber, to be built of steel, is half-submerged. The ebb and flow of waves into the top chamber alters the air pressure in it. Air can only enter and escape through a small hole in the roof, turning the blades of a turbine-generator.

The research team has been asked to calculate costs and energy production for full-scale models for the Department of Energy. It and the Government Science Research Council have been providing funds. While the Department evaluates the system, research continues to improve the design.

Under the UK research program, a number of devices are being developed around the country with considerable collaboration between the research teams. The Department of Energy is looking for a workable 2,000 mw wave power system. BARBARA MASSAM



Massive development in Arabia leads to ecological action

UNITED ARAB EMIRATES—The threat of environmental pollution is spreading fast in the Gulf States, says Dr. Abdul Wahad Al-Muhaideen, director of preventive medicine in the Ministry of Health here. He warns that unless immediate and effective steps are taken, substances produced by the petrochemical industries will seriously threaten people's health.

The U.A.E., according to Dr. Muhaideen, has already taken some measures. They include a comprehensive survey of population density, industries, nature of soil, water and minerals and sources of energy. The government is framing laws for regulating traffic on sea, land and in the air.

The U.A.E. government, with neighboring states, is preparing to implement the U.N.-sponsored Kuwait Regional Agreement which urges each Gulf state to set up a national specialized body to fight environmental degradation.

MUSA DAJANY

Asian and Pacific nations begin regional ocean plans

ISLAMABAD—There is growing concern among several countries of the Asia and Pacific region over increasing marine environment problems.

As traffic increases and efforts are intensified to exploit the resources of the sea, it has become imperative that parallel efforts be made to ensure that development does not conflict with the need to protect the seas and oceans so vital to the countries that depend on them.

ESCAP (Economic and Social Council for Asia and the Pacific) in cooperation with the Swedish Environment Protection Service (SEPS), has initiated a project aimed at protecting the region's marine environment.

The first phase involves 12 ESCAP countries, and highly successful national seminars have been held in Jakarta, Manila, Kuala Lumpur, Bangkok, Goa (India), Dacca and Islamabad. These seminars are designed to appraise new technologies and approaches, and are intended to be a forum for exchanging views and information.

Following the national seminars, a regional meeting will be held in Bangkok to which two participants from each country—one technical expert and one policy maker—will be invited. The regional meeting will be immediately followed by a study tour to Sweden.

The primary objective of phase two is to assist in strengthening national capacities for dealing with the problems of protecting marine and coastal ecosystems. More specifically, it will establish a regional training center, laboratory and data bank. It will also provide assistance to countries, as required, in strengthening national legislation so as to conform to existing and future international conventions and protocols. And it will help appraise national needs for equipment and identify and prepare country projects.

MOHAMMED AFTAB

Indian scientists don't want imported U.S. solar pumps

NEW DELHI—Indian scientists are upset about a plan to import solar pumps from the United States.

The government is anxious to save crops amidst the drought conditions now prevailing in most parts of the country.

If the Finance Ministry approves the Ministry of Rural Construction's proposal, India may import 100 solar powered pump sets from the American firm, Solar Electric International, at a cost of \$625,000—duty free. Then the U.S. firm would set up a factory at Puri in the eastern state of Orissa in partnership with Indian Detonators Limited (IDL), a private firm in Hyderabad, to serve the Indian and South Asian market.

The U.S. pump can irrigate one hectare a day provided there is sunshine. Indian solar scientists are upset because a local firm, Central Electronics Limited (CEL), has already developed totally indigenous solar pumps, \$625 cheaper, which will pump water even on a cloudy day.

R. MURALI MANOHAR

In Asia...

COMPLAINTS OF AIR POLLUTION increased by 20 percent in the New Territories (Hong Kong's suburbs) last year compared with 1978. The increase was attributed to the rapid development of satellite towns. The Air Pollution Control Division of the Labor Department investigated 975 complaints, and the main offenders were factories and restaurants which were fined anywhere from \$41 to \$548. In 1978, 50 offenders were prosecuted.

THE SINGAPORE GOVERNMENT will soon control the sale of insecticides and license pest exterminators. New rules are being drawn up to protect the ecology of Singapore and to prevent the over-use or misuse of insecticides which may make pests immune to them. This was recently announced by the head of the Vector Control and Research Department of the Ministry of the Environment, Dr. Chan Kai Lok.

COMBUSTIBLE WASTE GAS from a large carbon black factory near Tokyo will be harnessed to generate electricity not only to meet all of the factory's power demand but also for outside sales, Toyo Continental Carbon Co. recently disclosed. The company has started building the power plant, which will cost \$2.9 million, in the compound of its Yokoshiba factory in Sambu County, Chiba Prefecture. It should be completed by early April. The factory consumes 2,200 kilowatts while the power plant will need 600 kilowatts to run, leaving 2,000 kilowatts as surplus for sale.

CONSTRUCTION OF AN INDUSTRIAL WASTE disposal plant was begun recently at Pisan Industrial Estate in Taegu, Kyongsang Pukto of South Korea. The \$6 million plant, scheduled to be completed by mid-1981, will have a daily capacity of 30,000 tons. The Small and Medium Industry Promotion Corporation said it will be the first large-scale anti-pollution facility in the nation. At present, there are 71 industrial plants on the estate.

THE BANGLADESH GOVERNMENT plans to provide 12.6 million families in rural areas with solar cookers.

Dr. R.A. Ghani, who heads the Ministry of Science and Technology, said the supply of these cookers to villages is the first phase of a nationwide program for use of solar energy in the economy. The government's program also includes using solar energy for generating electricity and for drying fish and tobacco on a large scale, Ghani said.

About 2 million tons of firewood and twigs are consumed annually as cooking fuel, mostly in rural areas, according to official statistics.

Forestry ...

ALL MISSIONS of the U.S. Agency for International Development have been requested to report to AID Washington on countries where deforestation and loss of ground cover constitute a serious threat to development activities. The missions are to report also on "where there is an awareness and a commitment on the part of a country to bring about improvements in the situation." This information will enable the agency to sort out the necessary financial and technical resources that may have to be committed.

In August of last year, President Carter signed into law an act that specifically authorized AID to provide assistance for forestry projects—in the broadest sense—so as to meet basic human needs.

SWEDEN is going to establish a genetic bank to preserve the hereditary characteristics of its ancient tree varieties, especially the fir and spruce.

The process of preservation can be done in two ways: by protecting proven tree stands which continue to live through self-generation, or by preserving seed for a short time under refrigeration. Through such a bank old genetic material can be made available for comparison to determine whether anything is going wrong in the constant improvements in growing methods.

The Board of Forestry will be in charge of the program to be set up at the college of agriculture in Ultuna.

THE PHILIPPINE Bureau of Forest Development (BFD) will step up the reforestation of the country's estimated five million hectares of denuded and open forest lands this year. Some 500 forest guards will be hired to boost the present force to 4,000 men. And scientific forest management techniques will be implemented to enhance the productivity and utility of logged-over areas and virgin forest lands.

THE THAI MINISTRY OF AGRICULTURE and Cooperatives is expected to spend over \$4.9 million this year to carry out a nationwide survey of destroyed forest areas. The budget is for additional manpower and survey equipment. The Ministry has already allocated completely destroyed forest areas to various government agencies to be developed into village communities and cooperatives. The Thai government has set a policy to allocate 15 rai (2.4 hectares) of land to each family now living in the areas and they will be given title deeds on the land which are not transferable. Those who occupy more than 15 rai of land are required to replant trees on the areas in excess of 15 rai.



Massive population growth strains Thailand's resources

BANGKOK—Thailand's current population is about 44.5 million, 10 million more people than it had a decade ago. This rapid growth has strained natural resources, and forests may have suffered the most.

According to a recent survey by Kasertsart University, "Forest areas in Thailand classified as intact—those with sufficient trees for commercial logging—total only 131,785 square kilometers, or 25.35 percent of the country's total area." Only five years ago, a similar satellite survey indicated that forest areas accounted for 38.61 percent of the total terrain. This alarming decrease has been occurring at an average rate of 9.9 percent, or 80,104 square kilometers a year.

Another resource which has suffered is water. In Bangkok, which had some 4.9 million people as of end-July 1979, the demand for water has risen to around one billion liters a day. Much of this eventually becomes waste water, practically all of which is discharged into the Chao Phya River running through the center of Bangkok. Factories on the coastline discharge directly into the Gulf of Thailand—a total of 157.7 tons BOD (Biochemical Oxygen Demand) daily, a recent survey found.

Since there is not a significant number of factories in the country, air pollution has yet to reach the critical stage. Also, the country's total urban area is about half that of other countries in the region.

The situation in Bangkok is completely different. A preliminary investigation of suspended particles at nine major city points found that the average concentration of carbon monoxide was between 19 and 40 ppm (parts per million) in an hour, and between 13.6 and 32.4 ppm in an eight-hour period. This is much higher than the internationally accepted levels of 25 ppm in one hour and 8 ppm in an eight-hour period.

The National Environment Board (NEB), created under the 1975 Promotion and Preservation of the National Environment Act, is responsible for coordinating the activities of various government branches as an overall policy maker. It proposes plans, standards, administrative and legislative measures to the government for the enhancement and conservation of the environmental quality. Although chaired by the deputy prime minister, the NEB has yet to be granted executive or penal powers, but must refer to relevant government agencies or the Cabinet for action. TONY OLIVER

Mexican strike threat forces government eco-controls

MEXICO CITY—After more than a decade of citizens' complaints and recent press reports, Mexican environmental specialists are taking a look at the effects of 11 cement factories on towns near Mexico City.

The director of air sanitation, Enrique Tolivia Melendez, visited the site and found a gray cement dust as far as a mile and a half from the factories. Formerly fertile ground was covered with a hard layer of cement, the effects of rain on the dust. Trees and plants had lost their color and leaves, and crops were misshapen and dwarfed.

Specialists said as many as 30 percent of the 100,000 area residents may have respiratory ailments and silicosis, apparently caused by 300 tons of cement dust emitted daily.

Led by a voluntary citizens committee and their union, workers at the factories have threatened a strike unless certain conditions are remedied. Among their conditions—none of which involves more pay—are the improvement of anti-contamination equipment, regular medical check-ups for employees and immediate indemnification for illnesses suffered as a result of the cement dust.

Director Tolivia Melendez, who works within the federal subsecretariat for environmental improvement, under the Secretariat of Health, has promised federal anti-contamination laws will be applied to the cement industry and that the situation will be improved.

KATHERINE HATCH

U.S. and Mexico studying under-sea earth movements

MEXICO CITY—Important new data on the earth's crust, cracks and quakes is being processed from the most comprehensive project ever undertaken to monitor sea-floor activity. Site of the project was a relatively new section of the earth's crust off the west coast of Mexico in the Pacific Ocean, below the Gulf of California.

Of special interest was the Rivera Plate, which produces many earthquakes. It is named for Diego Rivera, the fiery Mexican muralist. Unlike portions of the Atlantic Ocean, which may be more than 80 million years old, the crust in the Rivera Plate region is estimated at one to five million years old.

Using five ships and 67 submersible seismometers—virtually all of the delicate, underwater earth-movement measuring devices in the world outside the Soviet Union—Mexican and American scientists detonated explosive charges to simulate earthquakes and to study the composition and density of the earth's crust. Data from the two-month study is expected to shed new light on how the giant plates were formed and why they move.

Land teams worked in areas adjacent to the sea explosions, measuring the simulated sea-floor quakes as they moved inland. An unexpected task for the land teams was a genuine earthquate in Mexico, which they successfully monitored before, during and after its major shock, thereby obtaining additional information on the earthquake phenomenon.

In Latin America . . .

COLOMBIAN PRESIDENT Julio Cesar Turbay has signed a new penal code that establishes prison sentences of up to eight years and fines as high as \$125,000 for crimes against the country's natural resources. The code covers animal, forest, mineral, air and water resources. Six categories of crimes are listed, ranging from illegal occupation of national parks and unauthorized mining to destruction of wildlife on the country's list of endangered species. Other crimes include environmental pollution and the introduction of infective agents responsible for plant and animal plagues.

FIFTEEN LEATHER AND TANNING factories have been ordered to evacuate their premises because of environmental pollution in the Aburra Valley in southwestern Colombia. State authorities ordered the eviction after laboratory tests revealed a high degree of air and land pollution. The factories have been given three years to relocate on the valley's outskirts or in other states away from population centers. The new installations will be required to contain anti-pollution equipment.

MONTSERRAT has become the sixth member government of the Caribbean Conservation Association (CCA), an organization committed to preserving and developing regional environments.

The Barbados-based CCA, which announced the new member, explained that Montserrat can now call on the organization for technical and financial assistance for environment-related projects.

The CCA said it had already provided the island assistance in national park planning and management, and has previously aided its National Trust, a non-governmental organization which has been a full CCA member for several years.

AFTER HURRICANES David and Frederic ravaged several Caribbean islands last Fall, an assessment of environmental damage to their delicate tropical eco-systems has taken second place to the immediate needs and priorities of getting economies together and alleviating human suffering. But the toll to the environment will eventually be assayed and, in some cases, found irreversible. Rain forests have been destroyed causing spinoffs ranging from the loss of habitat for a wide range of tropical fauna to massive soil erosion which will change ground water systems and reduce the fertility of a thin cover of topsoil, silt harbors and change marine life patterns.

Noise ...

"NORMAL" NOISE in Mexico City is dangerous to the hearing of about half the city's 14 million inhabitants, a new study shows. Investigators avoided factories, discotheques and street traffic to concentrate on the levels of noise contamination within multiple-family and single-family housing.

Using a base of 85 decibels as the minimum level for possible hearing damage, researchers found that most electric kitchen blenders emit 88 decibels and radios or phonographs played at top volume register 92 decibels, two above the

90-decibel mark which causes a 10 percent

hearing loss.

The "Mexican character" which sometimes makes itself evident with yelling and playing radios at top volume, is partially to blame, the study said. With most city residents living in multiple-family dwellings, it is difficult to avoid neighbors' noise, noted investigators from the National Autonomous University of Mexico who worked with the federal Sub-secretariat of Environmental Improvement and the World Health Organization.

THE CHINESE MINISTRY OF HEALTH and the State Labor Bureau have recently formulated a set of health standards for noise in industrial enterprises, enforceable as of January. The standards call for a noise level of not more than 85 decibels in all factories built after January. The level in existing factories is permitted up to a maximum of 90 decibels. Those factories which exceed the required standards must take measures to meet the new standards within a given period of time.

THE MALAYSIAN PARLIAMENT recently approved an allocation of \$45,660 so the Ministry of Science, Technology and Environment can purchase equipment to monitor the Concorde's sonic booms. According to the Minister, Tan Sri Ong Kee Hui, the equipment can also be used to study noise problems in urban areas.

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The Center is a non-profit, non-advocacy, educational organization which seeks to foster public understanding of global environmental issues. Established in 1974 by the UN Association of the USA with the support of the UN Environment Program (UNEP), the Center alone is responsible for WER's contents.

All data on the project, known as the Rivera Ocean Seismic Experiment, or ROSE, is being processed at the University of Hawaii's Institute of Geophysics where a seismic data archive is being created. Other institutions participating included the National Autonomous University of Mexico and, in the U.S., Woods Hole Oceanographic Institution, Mass.; University of Wisconsin; University of Texas; University of Oregon; Oregon State University; Columbia University and the Scripps Institution of Oceanography, Calif.

KATHERINE HATCH



Bolivia's new government acts to protect its wildlife

LA PAZ—The democratic winds currently prevailing in Bolivia seem to have freshened interest in preserving its wildlife and natural resources.

Devastation of non-renewable resources, in several places reaching alarming levels, has aroused serious preoccupation in the government, which is now committed to search for measures to cope with the problem.

In the Parliament, working again after more than a decade of military dictatorship, a Deputy was elected who represents a political organization whose main aim is to protect natural resources (Center for the Defense of Natural Resources).

More than half of Bolivia's one million square kilometers could support wildlife. However, excessive hunting of monkeys, parrots, reptiles, alligators, crocodiles and cats for export is threatening these species and is a danger to the country's ecological balance.

"Some species are facing complete extinction", said Oscar Mendez, Wildlife Director of the Ministry of Agriculture.

Recently the government banned the hunting of 52 species, among them birds, fishes and reptiles threatened with extinction.

Mendez, who led the Bolivian mission to the Wildlife International Union meeting in Bonn (which began Jan. 29), announced several proposals to stop this illegal trade. One step will be a formal request for cooperation from Paraguay, which processes illegal skins.

Bolivian authorities also are planning to set up and protect national parks and to extend reservations areas. As part of this policy, the government will operate three alligator breeding grounds in the northern, tropical areas where indiscriminate hunting has led to the specie's near-disappearance. As a result, most of the rivers are becoming pirana-infested.

The government is increasing its control on hunting and fishing areas, but Bolivia has only 100 forest guards and the minimum need is reckoned at 600. Illegal hunters pay fines up to \$5,000 and face a prison sentence.

JUAN LEON and HAROLD OLMOS

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JANUARY 28, 1980

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Mexico plans to train farmers to develop natural resources

MEXICO CITY—Faced with massive drought and a continuing unemployment problem, President Jose Lopez Portillo has devised a plan whereby hundreds of thousands of farm workers will begin restoring eroded lands to productivity.

Mexico's worst drought in a half-century has forced the evacuation of hundreds of thousands of humans and animals and has destroyed millions of dollars worth of crops.

To counter the devastation, some 750,000 "productive and remunerative" jobs will be created by the government each year for the remaining three years of Lopez Portillo's presidency.

The first of these will be for 100,000 out-of-work "campesinos," or country farm workers, who will be trained by government technicians in the protection and development of natural resources. Their first job will be the planting of 305 million trees as a first step toward recovering nearly 1787 square kilometers of land.

If the National Work Program succeeds, more than 28,000 square kilometers of land not usable now will be returned to cultivation and more than six billion trees will be planted to retard erosion. Technicians will provide the farmworkers with better seeds, fertilizer and fumigation methods and teach them how to control flash flooding.

KATHERINE HATCH



Both Panama and Colombia are possible sites for a new canal

MEXICO CITY—Reports reaching Mexico say a \$25 million feasibility study is underway for a possible Panamanian-Japanese project to build a new canal across Panama. High on the list of considerations will be the ecological impact of the new sea-level waterway across the Central American country.

In a separate report, Colombian maritime official Gerardo Castro Sarmiento is quoted here as saying U.S. government representatives are studying the possibility of putting a new canal through Colombia, utilizing the Atrato or Truando rivers in the northern part of that country.

In Latin America ...

VENEZUELA'S PRESIDENT LUIS HERRERA recently decreed the creation of an international Institute of Advanced Studies on Man and the Environment. Its purpose is to give postgraduate courses and undertake research, with emphasis on human neurology and genetics, animal and plant biology, environment and natural resources, and their corresponding technologies.

Besides research and teaching, the Institute will be charged with carrying out applied work in the fields of education, health, social development, agriculture, energy, industry and public services.

AFTER THE FIRST ECOLOGICAL SEMINAR in Brazil's mountain resort city of Petropolis, 50 kilometers north of Rio de Janeiro, city authorities began clearing up "visual pollution."

Outdoor advertising signs were removed from highways around Petropolis. Despite existing laws, thousands of billboards have for years obliterated the view along roads leading to this historic city and others in Brazil.

The law forbids erecting billboards on government property and restricts them to a distance of 33 feet from the highway on private property, but it has been generally ignored. Now a Petropolis city by-law authorizes dismantling the billboards in three months time after warning the advertisers.

REPORTS OF THE IMMINENT DEATH of Mexico's runaway offshore oil well, Ixtoc-1, were premature. Although but a shadow of its former, fiery self, the well in the lower Gulf of Mexico off the Yucatan Peninsula continues to spill oil and resist attempts to control it.

Bad weather conditions creating rough seas were blamed for a failure to halt the flow. A huge inverted funnel or "sombrero," specially designed to separate oil and natural gas from seawater, has not worked up to expectations, although it has been credited with 70 percent efficiency while it is operational. An adjacent well was drilled to 1xtoc-1 and salt water is being pumped into the well site to reduce pressure on 1xtoc and enable a complete closing-off. The well exploded last June 3.

Castro Sarmiento, head of the Colombian Merchant Marine Association, said the present Panama Canal will be useless in 15 years because of the constant sedimentation of a key part of the canal, Gatun Lake. He said the lake undergoes the loss of as much as 52 million gallons of water with each ship that passes through it and that trees along the lakeshore have been cut indiscriminately, hastening the sedimentation.

Panamanian president Aristides Royo reportedly will visit Japan in March to meet with representatives of the Mitsubishi Corp., an industrial conglomerate, and the Penta Ocean Construction Co., Japan's largest dredging firm, which are interested in a joint canal venture.

If plans proceed—and the feasibility study, due for completion within three years, indicates a new Panama canal would be beneficial—work could begin in 1984 on what is now expected to be a 10-year project costing around \$12 billion. The present Panama Canal, which comes under full Panamanian control in the year 2000, is unable to handle super tankers. KATHERINE HATCH

WER interviews Brazil's environmental chief

BRASILIA—Brazil's environment chief, Paulo Nogueira Neto, is in a fortunate position. Because of the energy crisis, his budget is double last year's. Other ministries were not so lucky.

"The problems as we see them in the future come from the energy crisis and attempted solutions," Nogueira Neto told WER. "Brazil's plan to use coal in great quantity is a reason for great preoccupation because of the resulting pollution." His office, SEMA, the special secretariat of the environment in the Interior Ministry, is working with the Ministries of Mines and Industry and Commerce to coordinate plans to check pollution. The idea, he said, is to make all contracts include the purchase of pollution control equipment.

"On Brazil's other alternative energy plan, the alcohol program (for gasohol), we are concerned about the effects of the sludge residue." Each liter of alcohol from sugar cane produces 12 liters of highly toxic sludge, he said, but when treated it can be used as fertilizer. "Indeed," he commented, "in the state of Sao Paulo 90 percent of the sludge has been used for that purpose for 15 years." If used that way nationwide, he says it could save up to 40 percent of the fertilizer used on sugar cane plantations. "Since last year we have forbidden dumping sludge in rivers. Those who break the pollution law will be disciplined, not by fines but by what we consider a more severe punishment, losing their rights to government credit and other incentives."

Nogueira Neto, who has headed SEMA since its founding in 1974, says that during those years "the big environmental polluters in Brazil have been controlled. There is still much to be done, but the more serious cases have all been taken care of." Brazil's biggest industrial pollution problems are with small, old and obsolete industries, he said.

SEMA is beginning to make longer-range studies of the big

ecological problems, like heavy metal pollution on which it has been cooperating with other government agencies for over a year. It is studying also desertification, slash-and-burn agriculture, acid rain, the role of vegetation in controlling flooding, and it is now establishing wilderness preserves throughout the country to be used for scientific experiments and research. By the end of this year, he said, 14 will be set up out of a total of 17 planned.

"Until very recently, economic considerations came before ecological commitments but, happily, this is changing. Both government and private industry have come to the realization that by paying attention to the environment we also contribute to

economic development."

He said his goal now is to reinforce legislation: "We are drafting laws to overcome loopholes in the present ones. For instance, there is no law requiring presentation of ecological studies in new areas to be built up." This sounds as though it would apply particularly to the Amazon area, but SEMA does not have primary responsibility there; that lies with the Brazilian Forestry Institute (IBDF).

Even though his budget was nearly doubled, to \$3.7 million, Nogueira Neto says, "In order to act in a wider area we need more

money."

Still and all, he believes that "Today, Brazil has no equal in Latin America on the question of (dealing with) pollution. In nature conservation there are others who are ahead of Brazil. But we have made big strides. Before, people questioned if money spent on the environment could not have been better invested in economic development. That mentality of leaving environmental considerations to second or third priority has now changed."

GEORGE HAWRYLYSHYN

Spain's environmental groups unhappy with draft eco-law

MADRID—Environmental groups have given a chilly reception to a draft environment law expected to be introduced in parliament early this year to unify and update the legislation of the Franco years.

At its second federal council held late in December, the Federation of Friends of the Earth, Spain's largest environmental group, said the charter was drafted with "extreme ambiguity." For example, although it introduced environmental "crimes" to Spain, it left them so undefined as to be worthless.

The federation alleged that the draft, begun a year ago, had suffered "serious modifications" in its passage through government. It called for the resignation of the new Director General of the Environment, Maria Teresa Esteban, on the ground she was

"unsuited to carry out her job."

Friends of the Earth accused Ms. Esteban, whose appointment to succeed the dynamic Daniel de Linos was announced six months ago, of reversing her predecessor's policy of collaborating with environmental groups. The federation said it had repeatedly and unsuccessfully asked to have its voice heard in the initial stages of the environmental law draft.

JULIE FLINT

More on Latin America

YEAR-END CONTAMINATION of Mexico City's air was 50 percent worse than it was just a year ago, environmental improvement authorities report. They were unable to say why there has been such an increase, except for the increased number of automobiles, now estimated at nearly 2 million, daily using the capital's streets.

A Mexican tradition of burning automobile tires at Christmas and New Year's is being discouraged by authorities but has not been

completely halted.

A PARTIAL SOLUTION to air pollution has been found by Mexico City, which is using electric trolley-buses instead of diesel or gasoline-powered buses. An estimated 600 trolleys, each with a life expectancy of 30 years, travel 11 routes including five of the capital's new high-

speed, one-way axis streets.

Some 500,000 passengers ride the trolleys daily, paying the cheapest fares in town, under 3 cents. Eventually, Mayor Carlos Hank Gonzales would like half of the city's mobile population to use trolleys and the rest to ride the subway, which now carries 2.5 million riders daily. Subway lines, like the axis streets, are being extended for a population—now 14 million—that may hit 40 million by the end of the century.

This would relieve the crowded streets of the 1,750,000 private automobiles and 30,000 buses now adding to the air and noise population. Automobiles in the capital use an estimated 5 million liters of gasoline daily and emit more than 7,000 tons of contaminants.

A PLASTIC-EATING MICRO-ORGANISM may have been isolated by a Mexico City scientist. Indestructible plastic accounts for 600 to 1,000 tons of trash discarded daily in the Mexican capital. Dr. Antonio Garcia Trejo, biological scientist at Metropolitan University, has studied the problem for two years but admits any project to develop the micro-organisms would require high technology and costs.

ECUADOR is about to embark on its first urban development project, in Guayaquil, the largest

city in the country.

About 10 percent of the city's one million people will benefit directly. The project is targeted to help families whose incomes are below Guayaquil's absolute urban poverty threshold.

The World Bank will loan the government \$31 million for the \$51.6 million project.

In Europe...

A NEW DEPARTMENT OF ENERGY is to be set up in the Irish Republic.

Plans are being finalized for the department which, as one of its first tasks, will have to make arrangements for a referendum on nuclear energy. There have been many calls for a national referendum on the subject, but it seems clear that whatever the national ballot outcome, the Government in Ireland will give the formal go-ahead for nuclear power this year.

ECOLOGISTS from Canada, the US, Australia and Great Britain are starting an international boycott of Portuguese wine and the national airline of Portugal. Robert Hunter of the Greenpeace Foundation announced that the boycott is an attempt to force Portuguese authorities to free the "Sea Shepherd," tied up in a Portuguese harbor since July for ramming a pirate whaling ship, the Sierra.

The Sea Shepherd's captain, Paul Watson, claims the Sierra caught 25,000 whales in the last 10 years including pregnant and baby whales. Portugal, which doesn't belong to the International Whaling Convention, has allowed its harbors to be used for exporting whale meat.

THE IRISH FOX, an indigenous animal in Ireland's countryside, is in danger of extinction because its skins are fetching between £12 (\$25.44) and £14 (\$29.68) each.

In an unusual twist, hunts, which have often been criticized for their pursuit of the fox, are now joining in the call for its preservation.

They cannot find enough foxes to chase—all because a new "call" device has been introduced to Ireland which imitates the crying sound of a dying hare and brings the fox within range of gunmen, who have been conducting an intensive eradication program.

Some of the foxhunting groups have suggested the establishment of fox breeding farms.

"IMMEDIATE AND COMPREHENSIVE" measures to restore Irish salmon stocks are called for by the Electricity Supply Board in its annual fisheries report.

The Board, which has harnessed rivers for hydro-electric power, is responsible for controlling salmon stocks and, reporting a continued and serious decline, it blames commercial fishing.

The future of the Irish salmon is generally agreed to be in considerable danger because of over-fishing, particularly by drift-netting at the mouths of estuaries where spawning stock are prevented from getting through.

A Portuguese official says eco-laws are urgently needed

LISBON—"It is absolutely urgent to implement environmental legislation in Portugal," Jose de Almeida Fernandes, assistant to the state secretary for the environment, told *WER*. "In the absence of any general law, economic decisions for installing new industries are taken which could ruin our rivers and land."

The present government intends to have legislation ready for the post-election parliament to ratify as soon as it sits. As it stands now, the state secretary has given negative opinions on many industrial projects but nothing has been done to implement his views.

For example, a fairly new textile factory in Lisbon's industrial belt transports a highly toxic substance by boat to an unloading point on the Tagus River. If there were an accident at the moment of unloading, the most important estuary in Portugal would be poisoned and the health of two million inhabitants affected. According to the state secretary, the factory should never have been built there.

Portugal is also on the UN's critical list of countries running out of fresh water. "We will not have fresh water for irrigation or drinking by the year 2000 if the reserves continue to be polluted at the present rate. It is scandalous and dramatic that authorities are not paying attention to this problem," said Mr. Almeida.

Two UNDP-aided programs to utilize subterranean water are underway, south of Lisbon and in the Algarve tourist region where water is running out. But there is no government plan or policy to stop the pollution of Portugal's rivers. If parliament passes the proposed legislation, this would give officials and environmentalists the necessary power to halt the destruction and to guarantee efficient physical planning and environmental protection.

MARY MILLS

Eco-group helps kill plan to build Dutch industrial island

THE HAGUE—A Dutch environmental organization has scored the most impressive victory of its two-year existence. It played a major role in convincing the Dutch government that the plan to build "an integrated industrial complex" on an artificial island in the North Sea would be, among other things, a threat to the environment.

The Dutch government—in a report drawn up by 50 experts—announced that "the construction of an island to accommodate a large industrial concentration would not appear desirable at the present time."

The decision came 10 years after the original proposal was made by the North Sea Island Group (a consortium of 31 European firms—mainly Dutch and Belgian). Its defeat was welcomed by environmental organizations thorughout The Netherlands, especially the North Sea Working Group, an environmental coalition set up two years ago. It had been at the forefront of the nationwide movement to oppose the industrial-island plan.

The Group, which receives half of its \$50,000 annual budget from the Dutch government, is the first and only organization of its kind in the eight countries that border the 572,000-square-kilometer North Sea.

However, the government's decision to scrap the plan "at the present time" may have been based more on economic concerns than on environmental. It was estimated that production costs on an industrial island—figuring in the cost of building the island—would be about 50 percent higher than similar costs on the mainland.

When the plan was drawn up a decade ago, marked economic growth was expected through the 1980s. This prompted Dutch industrialists to look to the sea for building space that would be in short supply on the already overcrowded mainland. That growth is no longer expected, a recession has set in and, sources say, The Netherlands now has no shortage of land zoned for industrial use.

Yet the battle over whether or not to build artificial islands in the North Sea has really only begun, say Dutch environmentalists.

They note that while the Dutch government has called the building of an artificial island "not desirable at the present time," it added: "This does not mean that such an island is inconceivable, especially if the risk aspect and the distance from the nearest residential areas form an essential element in the choice of a site, if the number of employees is limited and if high production costs can be borne."

Sludge treatment in Britain may make the desert bloom

LONDON—In Britain an experiment in land reclamation by the Sewage Division of the Welsh Water Authority could have potential for desert areas.

Treated sewage sludge is being fed into an area of sand dunes along the Pembrokeshire coast. In the past, surfaces spreading led to little improvement in the soil because of wind erosion and sand movement.

The new method is to feed the sludge into rows of trenches three-fourths of a meter deep which are then covered by sand from further trenches dug alongside.

The experiment is in its early stages; the first treated area was sown with grass last spring and is being monitored for chemical changes, moisture retention and the die-off rate of pathogens. Results will determine at what stage the land will be safe to be put to agricultural use. Under laboratory tests the treated soil has shown a grass yield even higher than typical topsoil.

In spite of high transport costs, overall running costs are low and will eventually be further offset by increased land value.

Since the experiment began in May, 1977, nearly 10,000 kiloliters of sludge have been used in treating the first 2 hectares. The biggest potential for this system, suggests Operations Manager Norman Snow, is in desert areas with expanding cities which would produce sufficient sludge to have disposal problems.

BARBARA MASSAM

In Eastern Europe . . .

A RECENTLY PUBLISHED SURVEY of environment protection found Poland's water very polluted.

A survey of wells in farmers' courtyards and in towns and villages showed that out of 90,600 wells only 5 percent had clean water; in nearly 70 percent of the wells the water was unusable. In 1974, only 44 percent of the wells had bad drinking water.

The survey found that the Vistula and Oder Rivers had no drinkable water and that much of their water was unusable for any purpose.

According to the report, over 4 million cubic meters of sewage poured into Polish rivers in

PRAGUE CITY FATHERS hope to combat air pollution in the Czechoslovak capital with Soviet gas. At present, the Prague basin is the worst polluted in the country.

In the upcoming five-year plan, modernization of city heating plants is to be completed and conditions created for the construction of heating plants beyond the city perimeter.

Major reconstruction of gas, electricity and heat distribution systems, of which 29 percent are in bad repair and 30 percent will soon need repair, also will be undertaken.

IN BUDAPEST, Tibor Rakai Szabo, a department chief of the Ministry of Heavy Industry, has said that there will be more nuclear plants after the completion of the Paks nuclear power station, which is under construction on the Danube in the southern part of the country.

Szabo said that the Paks plant will produce 1760 megawatts of electric power by 1985, almost 25 percent of the country's electricity

needs.

He noted that Hungry had signed a Comecon nuclear power agreement providing for plants reaching a total capacity of 4000 megawatts in Hungary by 1990.

Construction of the Paks plant began in 1973. It is being constructed with Hungarian-Soviet-Czechoslovak cooperation. Two nuclear reactors of 440 megawatts each will produce electric power next year and more reactors will be added later.

In Asia...

ASIA'S FIRST LIGHTHOUSE and first two navigation light towers, powered by solar energy, have been constructed in Pakistan in the Port Mohammad Bin Qassim area. The project is part of a government strategy to exploit energy resources other than crude oil which costs \$1 billion annually in foreign exchange.

The lighthouse has been constructed on Khuddi island, about 40 kilometers from Karachi, in the Arabian Sea. Its solar-powered system cost \$17,500. This system is a combination of silicon solar cells and a 36-battery storage bank. It has a life of 20 years and needs only an annual check-up on battery water.

One navigation light tower has been constructed on another island near Khuddi. A second light tower will be ready by February, and will help ships to enter the mid-channel to Port Mohammad Bin Qassim. Both tower solar systems cost \$15,000.

THE CHINESE ECOLOGICAL SOCIETY was founded at a national congress of ecologists recently held in Kunming, in Yunan province in southern China. Professor Ma Shijun, deputy director of the Zoological Institute of the Chinese Academy of Sciences, was elected president.

INDONESIA'S environment chief, Emil Salim, has asked religious and social leaders in Bali to support safeguarding the island's environment. Bali is Hindu and the local people are obliged to hold Hindu ceremonies once every 210 days for the safety of vegetation and wildlife. These teachings are most relevant to the preservation of Bali's environment, Salim said.

He pointed out that regreening efforts in Bali have been only 4 percent successful so far.

THE PHILIPPINE Bureau of Forest Development (BFD) recently said that the government's 1979 program slowed the rate of deforestation and increased reforestation. In 1979, 78,976 hectares of denuded area were reforested, the highest amount on record. The BFD reforested 37,271 hectares, various ministries and government agencies accounted for 13,252 hectares, timber licensees planted 25,528 hectares and private citizens reforested 2,925 hectares.

The rate of forest destruction in 1979 was reduced to 62,196 hectares from 65,957 hectares in 1978. Factors contributing to the reduction of forest destruction in 1979 included the cancellation of timber licenses, the campaign against illegal logging and the control of shifting cultivation by the government.

German & American scientists aim to predict ocean flooding

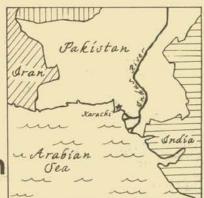
BRUSSELS—German and American scientists have joined forces in a massive research project that could set standards for future ocean flood prediction.

Code-named Marsen (Maritime Remote Sensing Experiment), the project involves at least 200 technicians, eight ships, 13 aircraft and land-based stations using remote sensing devices. They will monitor the sea's surface and the energy exchange between waves and currents to better forecast impending floods along the West German coast of the North Sea, from the Danish border in the north to the Dutch border in the south.

Scientists from nearly 30 research institutes—mainly in the U.S. and West Germany—are associated with Marsen, and its directors are from the Max Planck Meteorological Institute in Hamburg and the Jet Propulsion Laboratory in Pasadena, California.

GARY YERKEY

Pakistan is developing an Indus R. flood warning system



ISLAMABAD—Pakistan has already begun—with international assistance—a comprehensive project that will forecast the flow of the Indus River and act as a flood warning system for people living in its massive river basin.

The Indus starts in the Himalayas and flows nearly 3,000 kilometers through the center of Pakistan to the Arabian Sea. Every year millions of dollars worth of farm crops are damaged and hundreds of lives are lost when it floods.

The newest component of the project is a Quantitative Precipitation Measurement (QPM) radar at Sialkot, near the Indian border below the Himalayas. It was set up by the government's Meteorological Services in collaboration with the Water & Power Development Authority (WAPDA), World Meteorological Organization, the government of the Netherlands and the UN Development Program. Other components include expanding and modernizing the basic hydrological data base and processing system and a meteorological satellite readout station at Lahore.

WAPDA has already installed 25 rain and river gauge stations throughout the country and will have another 16 in place before the next flood season. All 41 will be linked via a telecommunication network.

The flood forecasting and warning project is scheduled to be completed by June of this year.

MOHAMMED AFTAB

Egypt is launching a massive sewage project for Alexandria

CAIRO-Once "the pearl of the Mediterranean," the Egyptian city of Alexandria has more recently been referred to by sanitation officials as "an environmental disaster area."

Each day an estimated 560 million liters of mostly untreated sewage is dumped directly into the Mediterranean or into nearby Lake Maryut. As a result, Alexandria's prized beaches are now grossly polluted and the lake, an important fish source, is well on

its way to becoming a swamp.

Renovation of the present disposal system has not kept pace with Alexandria's population and industrial growth over the last 25 years. Today, breakdowns and overflows are common, with sewage "ponding" near population areas and discharging into nearby surface drains. The incidence of water-related diseases (typhoid, paratyphoid, infectious hepatitis and dysentery) is noticeably higher in Alexandria than in Cairo.

"The present public health situation of the city's 2.5 million residents is close to a disaster," according to a report by the U.S.

Agency for International Development.

Something is being done about it: The Egyptian government has

launched a massive sewage disposal project.

It will cost \$431.2 million, to which AID will contribute \$167 million, the largest single grant the agency has ever made. The remainder will come from the Egyptian government.

When the first phase is completed, by 1985, two new primary treatment plants will have been connected to outfalls that will carry treated wastewater to points 10 and 8 kilometers off shore, far enough to leave the coastline clean.

Primary treatment will remove grit, "floatables" like oil and grease, and organic material. Whatever bacteria remain can be

further treated with chlorine.

AID planners say that although Egypt has endorsed a UN protocol to protect the Mediterranean against pollution from land-based sources, the agreement does recognize in principle

the need for outfall disposal.

In meetings prior to the adoption of the final plan, a number of Egyptian scientists questioned disposal at sea. They asked if the effluent could be re-used for agricultural irrigation. That alternative was ruled out when it was found it would cost three to five times as much as conventional irrigation and that the nutrient content of Alexandria's wastewater is so high that it could actually decrease crop yields.

The new system is not designed for processing the industrial waste which accounts for almost one-third of the city's wastewater. However, sanitation officials say that if industrial waste is introduced into the system in large quantities it can be detected

and neutralized chemically before passing out to sea.

But planners are convinced that the place to deal with industrial waste is at the source, and there is therefore a companion project to provide industries with equipment and technical expertise to prevent pollutants and toxics from getting into the city's disposal network. It has a \$20.5 million grant from AID.

NATHANIEL HARRISON

Environmental management...

KENYA is beginning a pilot agricultural project in the semi-arid Rift Valley Province to see if it can increase crop and livestock production and help improve the health of the local population. It should also provide more jobs and help Kenya officials upgrade their technical skills and knowledge.

This pilot project will be the foundation for a larger development effort in the Baringo District and in other semi-arid parts of Kenya.

The four-year project will cost \$8.6 million, of which \$6.5 million will be a long-term, nointerest credit from the World Bank's International Development Association.

WESTERN AUSTRALIA HAS CHANGED its mind about participating in Project Stormfury (WER,

March 26, p. 7).

The drought-afflicted state has agreed to help the 18-year-old project under certain conditions to be met by America's National Oceanic and Atmospheric Administration. For the 1979-80 summer cyclone season, flying, measuring and monitoring may be carried out, but no seeding. For the 1980-81 summer season, and for a possible five more years, cloud seeding would be allowed on "mature" or stable cyclones centered 95 kilometers away from populated areas.

In effect, the state is allowing seeding of cyclones at sea, and the rainfall-reducing effect of the seeding would have worn off before the

cyclone reaches the coast a day later.

TWO FACTORIES IN SHANGHAI, China, were each recently fined \$250,000 and \$151,316 by their parent company, the Shanghai General Petrochemical Co., for failing to check the pollution levels of their waste water. A year ago, the company signed economic contracts with eight other chemical factories in Shanghai so as to check and reduce industrial pollution. The contracts laid down economic sanctions against any factory breaking the agreement.

MALAYSIA'S ENVIRONMENT DIVISION will set up six more regional offices this year to monitor the environmental situation in the country, according to its Director-General, S.T. Sundaram. Each office will be headed by an environmental control officer who will investigate and take action on complaints by the public on pollution. At present, there are two such offices.

The Environment Division also planned to form a 13-member review panel to study the environmental implications of big construction and energy projects.

Down under...

THE U.S. OIL GIANT Exxon is interested in an oil-extraction-from-shale project in Queensland, Australia.

The Rundle project, one of the biggest in the world, will cost \$2.12 billion to develop and the Rundle partners, Southern Pacific Petroleum and Central Pacific Minerals, have been queried by overseas companies interested in helping finance the venture. There are proven reserves of 2 billion barrels of crude recoverable oil from shale, the average grade of which allows the extraction of 77 liters per ton.

Exxon's Australian offshoot, Esso Australia Limited, has asked to see documents on a survey of the deposits prepared by the "Rundle twins".

NEARLY HALF OF AUSTRALIA'S threatened plant species are in Western Australia, reports the Commonwealth Scientific and Industrial Research Organization.

More than 2000 Australian species—10 percent of all indigenous flora—are at risk or potentially at risk, and 45 percent of these are in Western Australia.

NEW ZEALAND'S ENERGY Research and Development Committee has issued a report on the potential of farming for fuel, and construction of a commercial transport-fuel plant using beets is one of their recommendations. The report is going through a review process, and selected companies will undertake feasibility studies on the proposal.

The committee's latest newsletter reports that research workers in Australia and New Zealand will cooperate on energy research and development, such as coal petrology and energy farming.

New Zealanders have reduced their use of transport fuels by 2.9 percent since weekend gasoline retailing was suspended early in 1979. The saving is well within the International Energy Agency target.

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Australia's barrier reef area proclaimed a marine park

PERTH—Australia's Great Barrier Reef, long in danger of being exploited for oil, has been proclaimed a marine park.

The Capricornia section, in the most touristed area, was chosen for the initial stage because its reefs, shoals and waters make a distinct geographical unit. It covers 12,000 square kilometers of the southern reef region.

The reef's ecology had been threatened by proposals to lift a 10year-old ban on oil exploration which led to major public opposition.

Both the state of Queensland and the federal government have pledged a policy of prohibiting drilling on the reef. The federal government appointed a panel of experts from the Australian Marine Sciences and Technologies Advisory Committee to advise on research programs and projects to increase knowledge of the reef. The state will manage the day-to-day affairs of the offshore park but will be subject to the Great Barrier Reef Marine Park Authority.

JANE NACZYNSKI-PHILLIPS



Papua New Guinea uses jingles and T-shirts to save energy

KONEDOBU—Papua New Guinea has begun its first official energy conservation campaign.

The National Energy Conservation program is urging Papua New Guineans to conserve electricity, benzine and diesel, the three main energy sources, through a campaign of radio jingles, theater advertising and T-shirt sales.

All government vehicles will bear stickers reminding motorists to conserve benzine and diesel, and some 25,000 posters will be plastered on service station walls and government buildings, including hotels, airports, schools and hospitals.

Minerals and Energy Minister Karl Stack said that in 1979 the consumption rate had increased about 10 percent while prices had gone up 40 percent. This, he said, led to an increase in foreign exchange outflow from 40 million kina (\$53.6 million) to K65 million (\$87.2 million).

JANE NACZYNSKI-PHILLIPS

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Rising gold prices halt the greening of S. Africa's dumps

JOHANNESBURG—The rising price of gold has slowed down one of the most ambitious environmental improvement plans in Africa—the grassing over of a 100-kilometer-long belt of sterile gold mine dumps in the Transvaal.

Twenty years ago, the Chamber of Mines began a \$40 million grass-growing program on the dumps to keep down dust pollution and to check acidic runoff which was severely polluting the Rand's scarce water supplies.

The great gold-colored dumps across the Witwatersrand, which include the biggest dump in the world (next to the black township of Soweto), contain 5 billion tons of highly acidic powdered rock. In dry, windy weather silica dust storms once gave the Witwatersrand the highest incidence of ear, nose and throat problems in the world.

Getting grasses to grow in the poisonous wastes was considered a botanical feat. It had the effect of turning the huge dumps into green hills. Trees and wildlife began to spread over them.

Lately the program has come to a halt in several areas. The Chamber of Mines is enigmatic about the reasons but did not deny that it is considering sealing the rest of the dumps—thousands of hectares in extent—with a concrete skin.

The Turfgrass and Revegetation Research Unit of the University of the Witwatersrand is concerned about the suspension of the program and puts it down to the price of gold. The dumps have up to 0.9 grams of gold per ton and this means it will soon be a profitable proposition to reprocess them. The organic "contamination" (grass) will present problems—hence the present indecision

As the law (Atmospheric Pollution Prevention Act of 1965) merely calls for the "best practicable means" to abate pollution, a concrete skin will be legal. But a public outcry is anticipated on aesthetic grounds.

JAMES CLARKE

Now the war is over, Zimbabwe has resettlement problems

SALISBURY—Land resettlement for many thousands of Zimbabwe tribespeople affected by the guerrilla war is a major concern here.

Patriotic Front leaders Joshua Nkomo and Robert Mugabe have said they intend to take over farms occupied by whites and turn them into cooperatives.

Land use ...

ENERGY RESERVE ZONES are being defined throughout Mexico and will be guarded for three decades without being used. Meanwhile, a national system of energy parks will be developed to exploit resources in these zones when they become available, and alternate energy sources—especially solar energy—will be pursued, said Dr. Javier Ibarra, directorgeneral of the Department of Application of Salt Water and Solar Energy in the federal Secretariat of Human Settlements and Public Works.

Resources in chosen zones throughout the nation already have been inventoried as to location and amounts of oil, natural gas, carbon, uranium, water and geothermal pressure, Dr. Ibarra said. In 30 years, when these resources may be used, infrastructure such as supporting industries and transportation systems will be available through the national system of energy parks.

MIDDLE EASTERN COUNTRIES have been urged to speed up financial and technical cooperation to tackle the region's most pressing housing and settlement problems.

Speaking at a meeting of experts convened in the United Arab Emirates by the UN Economic Commission for Western Asia (ECWA), Dr. Arcot Ranachandran, who leads UN's Habitat, said the region had special problems: "Never before in the history of civilization have such dynamic changes occurred in one region of the world in such a short period of time."

A big question, he said, was how far the tremendous investments made in this area had improved the quality of life.

THE BANGKOK METROPOLITAN ADMINISTRATION plans to spend about \$738,000 on a six-month campaign for a greener Bangkok. The campaign began early last December and will last through to May 1980. The program includes adding fertilizer and replacing dead trees with new ones. It also calls for pumping water from the Chao Phaya River through new mains, which will soon be installed, for watering trees and grass.

A government spokesman said about 100,000 trees were planted in Bangkok between August and October in 1979 and 29 water trucks have been sent out night and day to water them.

AROUND 50 PERCENT OF INDONESIA'S hundreds of nature reserves have been damaged and some have been totally destroyed, an official of the Indonesian PPA (Nature Protection & Conservation Agency) said recently. With the increasing threat of further destruction, the official said it was urgent to exercise stricter control over the country's resources.

The 5,400 white farmers, who produce 90 percent of the country's food and other agricultural produce, are prepared to concede 25 percent of their land including some of the best.

The Commercial Farmers' Union (CFU) has put forward a scheme for resettlement areas in which tribespeople can own from one to 10 hectares of land with government assistance.

Three schemes near the Mozambique border are already operative. One grows sugar cane, primarily for the production of the gasohol additive ethanol.

CFU chairman Dennis Norman said Zimbabwe (Rhodesia), Kenya and South Africa are the only three countries in Africa selfsufficient in food.

He considered it necessary to resettle tribespeople quickly—and into land ownership—to maintain this position.

The government here is also anxious to embark on a new tsetse fly eradication program. The fly is encroaching on much of the low-lying areas, causing widespread cattle disease. JOHN KELLEY

Zambezi River electric scheme will flood exotic game reserve

SALISBURY—Conservationists in Zimbabwe Rhodesia have begun their battle to prevent a new hydro-electric scheme across the River Zambezi from flooding an elephant and crocodile sanctuary. Thousands of tribespeople would have to be moved from traditional lands and wild life rescued on a large scale.

Mana Pools is closed down because of the guerrilla war, but it is regarded as the most exotic game reserve in southern Africa.

The hydro-electric scheme is scheduled to be built into a new dam at Mapata Gorge, about 70 kilometers downstream from the pools. It will create a lake twice as long.

This project is one of four along the Zambezi between Zimbabwe and Zambia and is expected to meet the region's power needs over the next 50 years. The four dams are to cost about \$4 billion.

Conservationists complain that because of the guerrilla war they have been unable to study the effects of the project on the ecology and are beginning their protest as a holding measure.

Government game rangers are backing the protest. One suggested that as the country has coal sufficient for 200 years, this means of power should be explored instead.

JOHN KELLEY

Massive hydro projects begin in Costa Rica and Tanzania

SAN JOSE—At the end of last year, President Rodrigo Carazo inaugurated the first phase of Costa Rica's largest hydroelectric project. It will make the country completely self-sufficient in electrical energy. Up to now, almost \$20 million in diesel and bunker had to be imported annually to supply the electricity needed during the long dry season.

The Arenal Hydroelectric Project is being built by the Costa Rican Electric Institute (ICE), an autonomous agency of the government, with financial help from the World Bank and InterAmerican Development Bank.

Although only 56,000 kilowatt hours were generated at first, by February 168,000 KWH will be generated and on completion of all four stages of development the project will product approxi-

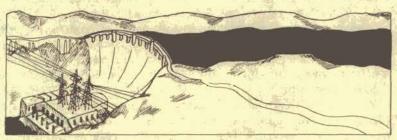
mately 700,000 KWH.

Waters from the Atlantic (Caribbean) watershed were diverted to the Pacific side of the volcanic mountain range which divides the country in two and a lake was created containing 1,700 million cubic meters of water. It covers an area of 84 square kilometers. The lake not only will be turned into a major recreation and tourist area but also will serve to irrigate over 100,000 hectares of Guanacaste Province's dry pampas, which normally suffer from drought eight months of the year.

The small towns of Tronadora and Arenal had to be completely evacuated and relocated from the watershed area formed by the new lake and new towns were built incorporating modern urban

design techniques.

Originally, the plant was expected to begin operating in February 1979. However, the initial inauguration attempt resulted in a near national disaster when an 800-meter-long section of tunnel, which runs through a geological fault zone, was damaged and the entire country was put on electric rationing. This design failure cost the government over \$30 million in tunnel repairs and rebuilding and importation of diesel and bunker, and this figure does not include the incalculable losses suffered by the private sector.



In a related development, around 100,000 Tanzanians will benefit directly from the construction of a new hydroelectric dam on the Rufiji river, while its power plant should benefit millions more.

The dam, 140 miles up-river from its outlet in the Indian Ocean, will reduce the widespread flooding that occurs during heavy rains. Construction is due to start in 1982, and the United Nations Environment Program (UNEP) has helped carry out a preliminary study of the environmental implications.

A UNEP team headed by Russian scientist Prof. D. Ratkovitch has warned that improved living conditions for people in the Rufiji river basin will endanger the animal population in the nearby Selous game reserve. Measures must be found to protect the wildlife as human habitation increases.

Other warnings are given on the likely effects of a reduced flow of silt to the Rufiji's flood plain and of possible salinization of the land.

UNEP's Soil and Water Task Force chairman Letitia Obeng said she hoped their studies would inspire other organizations to assist in sound planning of the Rufiji project.

MURRAY SILBERMAN CHARLES HARRISON

Energy Sources...

THE ENLARGEMENT of Venezuela's Guri Dam will save the country 230,000 barrels of oil a day, according to Francisco Aguerrevere, President of Electrificacion del Caroni C.A. The government company has contracted with a Brazilian-Venezuelan consortium to raise the dam wall by 52 meters, thereby quintupling the artificial lake behind it to 4,200 sq. km. When the Guri expansion is completed, Venezuela will have the second largest hydro-electric generator in the world after Itaipu (going up on the Paraguay River), with a generating potential of 9 million Kw., or enough to supply 14 cities the size of Caracas.

Target date is 1985, but labor problems continue to threaten delays. Aguerrevere estimated the overall cost of the Guri expansion at more than \$4 billion.

Poland to stem the almost yearly floods of mountain rivers and to assist regulation of the main rivers.

One of them, on the Raba River, south of Krakow, will also ensure adequate drinking water for that ancient royal city.

A HUGE RESERVOIR, which will solve Athen's long-standing potable water needs, went into service late last year. It will also be used for

irrigation and electrical power.

The project consists of a 126-meter-long and 815-meter-wide earthwork dam, considered the largest in Europe, and an artificial lake covering 1600 hectares. Eighty percent of the water will be gathered from rainfall. No electric energy is needed to transfer the water along 192 kilometers of pipelines to the capital. On the contrary, the water powers a 12 megawatt hydroelectric station.

Construction lasted 18 years, with interruptions, and its total cost was \$450 million, but was necessary because of the tremendous increase in the capital's population since the end of

World War II.

A CRASH PROGRAM to electrify Soweto has begun, partly because South Africa's biggest black township (population 1 million) has an acute smog problem. Seventy-five percent of Soweto inhabitants burn coal for heating and cooking, and the altitude (1,500 meters) is not conducive to efficient combustion. Fortunately, southern hemisphere coal has considerably less sulphur than coal in the northern hemisphere and Soweto's sulphur levels are not much above the limits suggested by the World Health Organization. Nevertheless, respiratoral complaints are common and recovery periods for pulmonary diseases noticeably longer.

Nuclear Power...

A CHINESE GOVERNMENT scientist has urged that his nation develop nuclear energy—even if it means importing foreign technology and know-how. Zuo Hu made the proposal in an article in the Guangming Daily.

China has atomic research facilities but as yet has no power reactors. Last summer the regime broke off negotiations to purchase two power

reactors from France.

Zuo stated that "such matters will be postponed until the next century if we do not start the work now." He added that the country did not have a clear policy for utilizing energy resources.

FOUR LEADING SOVIET SCIENTISTS stressed at a press conference in Moscow their nation's determination to expand its network of nuclear power stations.

They issued a joint statement last month that declared further development of atomic energy would conserve dwindling oil and gas supplies

and protect the environment.

The scientists included the President and Vice-President of the Academy of Sciences, Anatoly Alexandrov and Yevgeny Velikhov; chairman of the Permanent Committee for the Peaceful Uses of Atomic Energy, Andronik Petrosyants; and the Secretary for Power Engineering, Mikhail Styrikovich. The latter two are also Academy members.

The scientists rebutted an article in the Communist party theoretical journal "Kommunist" (WER, Nov. 19, p.7) which warned that the USSR might face serious ecological and safety problems with its aggressive nuclear

power development.

RADIATION AT AUSTRALIA'S newest uranium mine, Nabarlek in the Northern Territory, is five to 10 times higher than originally predicted by

its operators.

Australia's Minister for Science and the Environment, Senator J.J. Webster, said reports from the Atomic Energy Commission indicated emissions of radon, delta and gamma rays were far above that predicted by Queensland Mines in its environmental impact statement. It was upon the terms in that statement that the government decided to allow mining to proceed.

Those opposed to uranium mining have pointed out that workers will be exposed to radiation at the higher levels for as much as a 10-hour shift each day. Queensland Mines wants to extract the highest-grade ore in 29 weeks using workers on long shifts. The mine was officially launched early in June. The uranium is valued at

\$125 million.



Europeans worry about atomic wastes from nuclear expansion

BRUSSELS—Nearly a year ago Three Mile Island stunned Europeans into wondering, what if? But now the shock has passed, and as oil prices rise, nuclear power is again seen as an energy answer. At the same time, attention has returned to the question uppermost in the minds of Europeans: What to do with the left-overs?

That this problem remains unsolved while nuclear power plants continue to be built disturbs Europeans for reasons special to their situation: Europe is a crowded continent. Dumping anything inevitably involves littering someone else's backyard—or your own.

Europe has developed the world's most ambitious program of nuclear power expansion. By 1990, according to EEC Energy Commissioner Guido Brunner, the nine member countries will have a nuclear power generating capacity of about 127,000 megawatts, more than quadruple the installed capacity in 1979. Some European countries, including Belgium, France, Switzerland and Sweden, plan to produce between 40 and 50 percent of their electricity by nuclear means by 1990. The projected figure for the U.S. is 30 percent.

What such a significant enlargement of Europe's nuclear energy capabilities will mean, environmentalists are quick to point out, is not only a proportionately greater risk of accidents, but a rising quantity of atomic waste—with nowhere to dump it safely.

In 1979 the nine-nation EEC produced 725 tons of radioactive waste in spent fuel rods alone. Yet to date, no permanent atomic-waste storage facility has been developed in Europe, and the earliest that one can expect such a facility—if all goes smoothly—is the year 2010.

Waste so far has been stored in temporary facilities at the nuclear power plants themselves. But that practice has never been considered anything more than temporary and has, in fact, already run up against its own limitations.

Authorities in West Germany recently expressed fears that three of the country's 15 nuclear power stations would have to be shut down by 1981 for want of adequate storage facilities at the plants. A similar situation is known to exist elsewhere in Europe.

Attempts therefore are being made—in England, Sweden, Belgium and West Germany—to move ahead with what some experts consider the most hopeful answer to the dilemma, packing the wastes in drums and burying them for the necessary millennia in salt deposits thousands of feet beneath the earth's surface.

The most advanced experiments in burial possibilities have

been underway for the past year near Gorleben, in eastern West Germany, where subterranean salt deposits are thought to be among the most stable in Europe. But no conclusive results of the experiments are expected before 1990, and only twenty years after that would the necessary excavations have been completed. Meanwhile, the problem of what to do with the accumulating wastes remains: In 1979, some 450 tons of spent fuel rods piled up and were stored in temporary facilities in West Germany alone.

West German wastes not stored in temporary facilities—as well as wastes from Sweden, France, Belgium and Japan—have been sent to La Hague, France, where a subsidiary of the French Atomic Energy Commissariat runs Europe's only nuclear waste repro-

cessing plant.

Since 1976 the plant has reprocessed only 110 tons of spent European nuclear fuel, against an annual intended capacity of 400 tons. Yet deliveries of atomic waste to La Hague have amounted to about 5,200 tons. The balance has been stored in pools and a local environmentalist calls it "the biggest atomic garbage dump in the world."

The reason for the French plant's failure to live up to expectations is the same as that which forced the U.S. to halt its reprocessing activities: It is uneconomical. Plans to build a multibillion dollar reprocessing plant in Gorleben, West Germany, have been shelved too. But Great Britain, Belgium and Spain reportedly still see reprocessing as a potentially valuable way to reuse—if not to dispose of completely—their spent nuclear fuel and have kept alive their plans to install reprocessing plants before 1990.

That Europe in the future can be expected to pin its hopes increasingly on reprocessing as a partial solution appears more and more likely despite France's failure so far to turn the La Hague

plant into a viable operation.

The reason: reprocessing yields significant quantities of plutonium, which besides being useful in constructing nuclear weapons is the fuel for what many think will be the nuclear power technology of the future, the fast-breeder reactor. In less than three years France will put into operation the world's first commercial fast-breeder, the so-called "Super-Phenix," a 1200-megawatt plant now under construction at a cost of \$1.4 billion near Lyons. With it France will have a 10-year lead over the U.S. in the commercial application of fast-breeder technology. And it has already begun to export it to neighboring European countries.

But scientists and environmentalists alike emphasize that reprocessing will never solve all of Europe's nuclear waste worries, for besides plutonium, the technique also yields huge quantities of radioactive liquid waste that will have to be disposed of

somehow, probably in solidified form.

An American scientist, John Abbotts, writing in the October 1979 issue of *The Bulletin of the Atomic Scientists*, says that whether spent reactor fuel is stored directly as waste or reprocessed, "...the final product is a material in solid form which must be stored.

"It seems foolish to allow reprocessing, with its attendant releases of radioactive material, exposure to workers, and risks of proliferation and sabotage from the production of plutonium reactor fuel, to provide a waste product that will be liquified, resolidifed and then sent to storage anyway." GARY YERKEY

Renewable Energy...

THE ENVIRONMENTAL PROTECTION Society of Malaysia (EPSM) has questioned the need for Malaysia to turn to nuclear energy when its renewable energy sources have yet to be fully developed. The Society is commenting on a National Electricity Board (NEB) study, which indicated nuclear energy was a promising source of power because Malaysia's alternate resources are limited. However, a Malaysian energy official said the hydro-electric potential in Sarawak alone is vast, and that gas reserves are well in excess of what will be committed to Japan for the next 20 years.

THE PHILIPPINE GOVERNMENT has signed a \$2.5 million contract with a French company, Societe des Moteurs Duvant of Valenciennes, to build gasification plants in the country. Four units rated 600 kilovolt-amps will use the fast-growing ipil-ipil tree for fuel, as part of an energy replacement program.

The Moteurs Duvant company was formed in 1878 and is a pioneer in motors powered by gas

obtained from vegetable wastes.

BHUTAN will invite UN experts to help the Himalayan kingdom harness solar energy to meet its energy requirements. It has over 200 days of assured sunshine a year, according to Lam Penjor, Secretary of the Planning Commission and Ministry of Development.

He said, "We are going to have experts from UNDP or ESCAP to see what type of experiment

would be conducive to Bhutan.'

BRAZILIANS ARE DEBUGGING modern windmills in preparation for large scale production of bigger units.

Experiments are coordinated by Liborio Farias of the CTA research institute in Sao Jose dos

Campos, in the state of Sao Paulo.

He said Brazil's biggest wind-power project is a 26-horsepower windmill set up in Fernando de Noronha, an island in the South Atlantic in line with Brazil's northeastern bulge. This mill has three arms of 3.2 meters each, is anchored on a ten-meter-high cement base and is controlled by a multiplicator which can vary the rotation from 110 to 350 rotations per minute.

Present plans call for the installation of a 500kilowatt windmill by next year and no fewer than 500 units of 1,500 kilowatts by 1985.

In Europe ...

WEST GERMANY now awards special emblems to products that are considered friendly to the environment.

The emblem, awarded since last June, goes to products that adapt themselves to environmental considerations without major detriment to usefulness or safety.

A 10-member Environmental Jury has considered the following product groups: completely recapped tires, multi-use bottles, glass recycling centers, environmentally safe spray cans, recycled paper, and quieter power lawn mowers.

IN MALTA, anti-pollution laws are being drawn up in collaboration with the Regional Oil Combating Center of the United Nations which was set up on this Mediterranean island three years ago.

A \$2.5 MILLION, 500-KILOWATT wind station will be built by German experts on Gozo, Malta's sister island, in the Mediterranean. Gozo forms part of the Maltese archipelago of six islets.

If successful, the Maltese government will consider building more wind-powered generators, said Mr. W. Abela, Malta's Minister of Development, Energy, Port and Telecommunications.

THE IRISH GOVERNMENT will appoint special officers to visit factories and other installations as part of a campaign to save energy.

They will offer on-the-spot advice on energysaving methods and identify problem areas which need attention.

CONSUMPTION OF HOME HEATING OIL is down between 20 and 30 percent in Ireland in response to energy conservation measures urged by the government.

State grants to convert to solid fuel heating (coal, turf, logs, etc.) and the soaring price of oil get credit for the dramatic fall-off.

Filling a domestic oil tank with 300 gallons now costs about £180 (\$381.60) in Ireland, compared with £36 (\$76.32) exactly six years ago, and the price is expected to go much higher.

The government has paid out £1,015,000 (\$2.15 million) in solid fuel conversion grants.

Sweden to eliminate heavy metals in the environment

STOCKHOLM—The Swedish government has banned the import of cadmium after July 1, 1980. It is one of several heavy metals considered hazardous to the environment.

The only exception to the cadmium prohibition is commercial fertilizer, but the Product Control Division of the National Environment Protection Agency (NEPA) is expected to recommend restrictions here too. Fertilizer is considered the largest source of cadmium in farm produce and in tilled land.

The ban will end the import and use of cadmium as a component of chemical products, pigment, plastics stabilizer and soil conditioner. According to NEPA, cadmium can be replaced in most cases by other substances or substitutes.

"The safety margins between the daily intake of cadmium via foodstuffs and the level which can cause damaging effects on mankind are now small," said Minister of Agriculture Eric Enlund in a commentary.

The government is also moving against the use of lead in gasoline, gradually reducing the permissible amount. A government working group has just reported that completely lead-free regular gasoline can be available by January 1, 1983. The environmental gains, the committee said, will be well worth the slight increase in the price of gasoline.

The decision to ban cadmium was delayed because two government departments differed at first on how to tackle the problem. The agricultural ministry wanted an import ban whereas the ministry of trade preferred a sales ban on grounds that such a restriction would not seem as challenging abroad. Foreign industry is said to be very negative to the Swedish initiative. The ministry of trade admits that customs will have difficulty in enforcing the import ban.

SPECIAL TO WER

Questions on environment and industry answered by computer

NAIROBI—The United Nations Environment Program's Industry and Environment Office in Paris is building up (in collaboration with other UN institutions) a computerized data base of selected information—the Industry and Environment File.

Starting with pulp and paper and petroleum, the data base will be expanded to cover aluminum, motor vehicle, agricultural, iron and steel, chemical, and non-ferrous metal industries.

The file at present is concentrating on the environmental aspects of manufacturing and production processes. A UNEP spokesman said: "To date it is the only international information system which specifically makes a clear connection between industry and environment." It is available to government and industry, and to scientific and educational institutions.

The data base (at present located in the UNESCO computer in

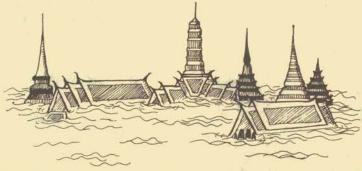
Paris) has information on pollution abatement and control technologies, discharge standards, ambient quality standards, environmental technology costs, etc. Each "topic file" carries cross-references to UNEP's International Register of Potentially Toxic Chemicals (IRPTC), and to INFOTERRA, UNEP's international referral system on general environmental information. INFOTERRA passes on to Paris any queries which are concerned with the relevant industrial sectors.

In effect, the system extends the INFOTERRA system into new and specialized fields. Inquiries can be sent direct (by mail, telex or phone) to the UNEP Industry and Environment Office, 17, rue Margueritte, 75017 Paris, France (phone 7661640, Telex 650273).

UNEP suggests that inquiries should indicate the appropriate industry; relevant data such as size of operation, processes and raw materials used; ambient information (meteorological conditions, baseline levels, conditions of waste receiving medium, etc.); the purpose of the inquiry; and the environmental problem (with details of the pollutants discharged).

CHARLES HARRISON

Bangkok is drawing so much well water that it's sinking



BANGKOK—Large areas of this capital city are sinking by 8 to 10 centimeters a year. This is a direct result of the largely unregulated pumping of fresh water throughout the metropolitan area, Thailand's National Environment Board (NEB) reported recently.

NEB Deputy Director-General Dr. Prakit Kiravanich announced that measurements at 60 test sites in the Bangkok metropolitan area indicate a rapid depletion of the underground aquifiers tapped by wells in Bangkok.

Initially, the subsidence was localized at well sites, but the unrestricted pumping of one million cubic meters a day has created extensive overlapping depression zones, especially to the east and southeast of the city.

Dr. Prakit said, "Bangkok must rely on surface water in the future if subsidence is to be stopped or at least slowed. Otherwise, it faces the distinct possibility of sinking below sea level."

The NEB findings are based on the preliminary results of a \$1.5 million, three and a half year study. The study is being undertaken in cooperation with the Asian Institute of Technology, the government's Department of Mineral Resources and the Royal Thai Survey Department. It will be completed in 1981.

KENNETH SNIFFEN

In Asia...

FOLLOWING CHARGES that its officials were corrupt and inefficient, the Philippines' Bureau of Forest Development (BFD) has been completely reorganized. The move affected forestry officials and employees all over the country.

ALL THE FIVE MALAYSIAN regional development authorities have agreed to form an action committee to study ways to solve the environmental problems in the country.

THE CHINESE COMMUNIST PARTY newspaper, "The Peoples Daily," said in Beijing that 15 of the 27 principal rivers in the country are seriously polluted and that faucet water in 41 of 44 cities tested is not safe to drink.

The article placed the major blame on industry and predicted that the danger would increase as China progressed towards modernization. It said that more measures to clean the environment should be taken and that existing ones should be more strictly enforced.

The article was clearly part of a recent campaign stressing ecological protection. The cities tested were not named.

ANTI-POLLUTION MEASURES adopted by the Chinese government in recent years have reduced Beijing's serious pollution problem. The city has cut down its annual soot deposit by an estimated 100,000 tons and reduced water pollution of seven major rivers and three reservoirs. The area of polluted underground water in the city's western suburbs has been reduced from 200 square kilometers to 30 square kilometers. Half the city's 14,000 industrial smoke stacks no longer belch black smoke and half the population is using gas for cooking. A number of noisy factories have been moved to the suburbs. 157 research projects undertaken to recycle and reclaim waste materials have resulted in savings of over \$263 million from 1972 to 1978.

At present, environmental monitoring vans patrol Beijing's streets and a meteorological tower, the tallest in Asia, monitors atmospheric changes to provide scientific data for pollution research.

The Beijing Environmental Protection Bureau has also decided to take the following measures: A ban on building plants with serious pollution problems, new factories must have anti-pollution installations, coal consumption will be cut down to a minimum and more gas used as fuel, sources of water pollution will continue to be monitored and controlled.

On the Subcontinent . . .

INDIA'S CENTRAL GOVERNMENT will soon set up an eco-development corporation to stimulate and support community action in soil and water conservation and afforestation.

The Agriculture Minister, Brahm Prakash, said the basic requisite for ensuring ecological security is to provide fuel and fodder in rural areas. The government has launched a large social forestry program which is designed to help village communities meet their fuel and fodder and, to some extent, fertilizer needs through green leaf and biological nitrogen fixation.

ENVIRONMENT GROUPS in Bombay are fighting the construction of a \$5 million fish processing plant in Colaba, at the southern tip of the city (which is a peninsula). They claim that the plant will not only place tremendous pressure on Bombay's congested roads—600 trucks will drive everyday into the commercial center—but will also be against the interests of traditional fish vendors along the coast since the fish will be processed for export.

The Maharashtra government has stayed further reclamation on the site—half the area of 10 hectares has been recovered from the sea—but will not commit itself to scrapping the project.

WORK ON A SPRAWLING 20,248 squarekilometer sanctuary for the great Indian Bustard —a bird facing extinction—has begun in the Ahmednagar and Sholapur districts of Maharashtra State.

The Maharashtra government will spend \$400,000 to save the remaining 200 Indian Bustards.

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India's jungle people win a round against a paper mill

NEW DELHI—An ambitious \$375 million World Bank-financed project for a paper and pulp mill in the tribal heartland of Bastar in Madhya Pradesh may be scuttled because of objections raised by sociologists and ecologists.

The Forest Department of Madhya Pradesh State had planned to deforest 40,000 hectares of jungle so as to plant pines for the mill.

When the Adivasis (tribals living in the forest) along with ecologists and sociologists protested, the government's plan to raise tropical pines was shelved.

The natural jungle has served as a vast storehouse for the tribals, supplementing their food requirements to such an extent that even during the worst doughts they always had enough.

The Forest Department claimed that within two decades the project would change the face of backward Bastar by generating employment for 100,000 people and help India earn foreign exchange by exporting paper.

But this project would deprive the tribals living in Bastar of their livelihood and, perhaps, their very existence. The government, under pressure from all sides, apparently has decided not to go ahead with the project though it is yet to announce its official decision.

R. MURALI MANOHAR



Your dinner of frogs legs hurts Bangladesh's ecology

DACCA—The export of about 1700 tons of frog legs a year is contributing to an ecological imbalance here, according to a report by the Planning Commission—the country's principal organization for long-term development.

The frogs (Rana Tigrina) feed on insects which attack crops. With an increasing number of frogs being caught every year for export to the West as a delicacy, nature's balancing mechanism has been impaired. The country must now use more pesticide to protect crops, causing unnecessary pollution, a Planning Commission official said.

A seminar conducted by the Bangladesh Zoological Society last month expressed concern at the rapid depletion of frogs in the country and asked for governmental measures to replenish stocks. AHMED FAZL VOL. 5, 1979

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World Environment Report . . .

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Europe adopts first agreement on transnational air pollution

GENEVA—The first international agreement to control air pollutants that cross national borders has just been adopted here by member governments of the UN Economic Commission for Europe (ECE).

A ministerial-level meeting, held here November 13-16, formally adopted a convention on long-range transboundary air pollution, which is now open for signing. A declaration promoting low and non-waste technology and the reutilization and recycling of wastes was also adopted.

"This meeting marks a major achievement in the history of the commission by providing a new dimension to regional cooperation in the environmental field," an ECE spokesman said.

Measures to control the transport of air pollutants across boundaries have been agreed upon in several bilateral conventions, but there had not been an effort to deal with the problem on a broader international scale. The convention and resolution therefore represent a major development in confronting the problem within a multi-lateral context.

The ECE has 34 members in Eastern and Western Europe and includes the USA and Canada.

The convention contains detailed provisions on such matters as exchange of information, consultations, research and monitoring. The contracting parties will develop policies and strategies to combat the discharge of air pollutants.

The convention places emphasis on further developing the cooperative program for monitoring and evaluating long-range air pollutants in Europe. The ECE has carried out this program in cooperation with UNEP and WHO for the past two years.

The declaration on low and non-waste technology and waste recycling provides for:

- evaluation of industrial applications while taking into account environmental and social consequences,
- national and international action through research and development, education, socio-economic incentives, exchange of information and transfer of technology.

It recommends creation of a working group to exchange information and publication of a scientific and technical review.

WILLIAM G. MAHONEY

Water Quality ...

THE RESULTS of Mediterranean pollution are coming "dangerously close" to being irreversible, delegates from 17 nations and the United Nations agreed at the conclusion of the Specialized Conference on Coastal Mediterranean Pollution held in Palma de Majorca, Spain.

More than 200 experts attending the four-day conference endorsed the findings of the Geneva conference (WER, July 30, p. 3) that land-based pollutants are the worst single problem the Mediterranean faces. They agreed to push for a comprehensive inventory of all wastes being poured and dumped in the Mediterranean.

The experts agreed that it is not yet possible to fully assess the effects of the Mediterranean pollution on the millions of people who live along its coast, but warned that a number of diseases already are endemic to the region.

DENMARK's Environment Ministry has ordered two new ships to step up capacity to deal with oil pollution at sea.

The order reflects Danish concern at the danger of a serious oil spill in the Great Belt between the Danish islands and in the Oeresund, between Denmark and Sweden, which are two of the world's busiest shipping lanes.

Their addition to the existing fleet of five small vessels will increase the capacity to handle an oil disaster from 500 tons to 10,000 tons. In addition a laboratory aboard will be used for maritime research.

A 270-PAGE REPORT, which contains a map suggesting the scope of oil-refining activity in Western Europe and of efforts to reduce and treat polluting discharges, can be obtained from CONCAWE, 60 Van Hogenhoucklaan, 2596, The Hague, The Netherlands.

THAILAND'S RAPID INDUSTRIALIZATION has brought serious pollution problems in the country.

Water pollution is the most serious—water from factories often contains organic and inorganic pollutants. While the organic pollutants deplete oxygen, many of the inorganic pollutants are toxic.

Major industries that create water pollution are food canning, sugar, tapioca flour, leather, textile, paper and pulp manufacturing, distilling and brewing, petroleum, chemicals and mining.

Air pollution originating from factories is less serious than water pollution. However, there are reports of workers being rushed to hospitals because they suffered from acute respiratory disease symptoms.

A survey by the Health Department showed that many factories operated at a noise level higher than 90 decibels. This affected not only the workers but the people living nearby.

UNEP's clean ocean programs are sailing ahead

GENEVA—The realistic Yugoslav who runs the United Nations Environment Program's effort to cleanse the world's seas has no illusions they can be returned to their original purity.

But Dr. Stjepan Keckes told World Environment Report that there has been steady progress in stemming the tide of pollutants, especially in the all-important coastal waters, and that international cooperation is definitely increasing.

Progress has been made, he noted, despite population growth and increasing industrialization.

As director of UNEP's Regional Seas Program Activity Center, Dr. Keckes organizes and directs plans to reduce pollution to acceptable levels in eight ocean regions: the Mediterranean, the Red Sea, the Kuwait region, the Caribbean, off West Africa, in East Asia, the Southeast Pacific and the Southwest Pacific.



"Oil wealthy countries in some of our regions—the Red Sea and Kuwait—have been quick to respond," he said. "But in poorer areas we can also offer effective arguments—facts—to show that it is in their own long-term interests to divert funds to curb water pollution. We can show that there are often hidden costs to undisciplined economic development and hidden benefits in protecting the environment. Let's cite, as one example, the health of the population. What is it going to cost that country over the long term if its citizens suffer from illness caused so often by polluted waters? What about the fishing industry—often a multimillion dollar question. Thus polluted coastal waters can be very costly."

Dr. Keckes said that UNEP provides "seed money" to get antipollution action underway. But with obligations around the world, it is in no position to act as a financial underwriter. When working in poorer areas—the Caribbean, West Africa or East Asia—it has often turned to third parties, such as the World Bank or UN Development Program, for financial backing.

All nations realize that the problem transcends political borders. No single country can clean up its waters if the neighboring country does not also act.

"Thus, in organizing our Mediterranean action plan, experts from the Arab lands and Israel worked together with no political differences preventing them from seeking purely technical solutions," Dr. Keckes noted. "In a similar way, experts from the

United States and Cuba are cooperating in preparing an acceptable Action Plan for the Caribbean."

And the sea itself helps: "The marine environment has a tremendous capacity to absorb pollution and cleanse itself," Dr. Keckes commented. The progress report is encouraging.

- The Mediterranean-The Barcelona Convention for the Protection of the Mediterranean against pollution and its two related protocols entered into force on February 12, 1978. To date 14 coastal states and the Common Market have ratified the agreements. In February, 1979, the governments agreed to a biennial program and pledged \$3.2 million for a trust fund to support it. Excellent progress has been made on a protocol to cover pollution from land-based sources, and this is expected to be adopted in May, 1980. Some 84 laboratories in 16 states are monitoring the Med and assessing its problems. It was the first UNEP target area and has shown the most results to date.
- The Red Sea—The Action Plan for the Red Sea and Gulf of Aden was adopted in January 1976. Activities are focused upon improving capabilities of scientists and institutions in the region, and a regional convention is under consideration.
- Kuwait Action Plan Region-The Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution entered into force on June 30, 1979, and so far has been ratified by five countries. Priorities will soon be assigned to specific steps, then the plan will immediately become operational. Almost \$6 million has been provided by the governments involved through a trust fund to support this initial
- The Caribbean—The preparatory phase, which began in 1976 is nearing its end and studies have focused on problems of human settlements, energy, agriculture and fisheries, human health, natural disasters and marine pollution. A draft Action Planlinking development and environment-will be ready for adoption at an intergovernmental meeting next spring.

• West Africa—Here again the Action Plan is expected to be approved and adopted in 1980. The draft Action Plan is now being reviewed by regional experts at workshops, seminars and meetings.

• East Asian Seas—This is the third Action Plan expected to be adopted in 1980. A series of preparatory meetings have been held this year on oil pollution control, coastal development and environmental impact assessment. Regional experts have discussed mangrove pollution problems and the effects of oil pollution on marine ecosystems.

 Southeast Pacific—This Action Plan will probably not be ready for adoption until 1981. A framework for the draft plan has been agreed upon. Legal experts are formulating the convention to protect the marine environment and on regional cooperation for emergency measures against pollution. Government experts will meet in 1980 to review the draft and the legal documents for submission to the intergovernmental meeting in 1981.

 Southwest Pacific—Its Action Plan will probably not be ready until 1981. A meeting in the second half of 1980 will lay the groundwork for future action at all levels and will consider the material that will go into the future draft Action Plan.

WILLIAM G. MAHONEY

Water wise ...

INDIA'S NATIONAL INSTITUTE OF OCEAN-OGRAPHY (NIO) in Goa has developed a working model of a solar still that can desalt water at a negligible running cost.

The multi-faceted still consists of a concrete slab, ordinary window glass, nylon threads and channels either of galvanized sheet iron or stainless steel for collecting the desalted water.

All that is required is that the still be filled with eight liters of sea water in the early morning and kept in the sun.

The initial construction cost should be about \$38 each, but that is likely to be reduced following prefabrication of its components.

SOVIET EXPERTS have completed technical and economic studies of the projected diversion of water from two Siberian rivers to more arid central Asian lands and have concluded that the gigantic construction scheme will have no adverse effects upon the neighboring environ-

The project calls for diversion of part of the flow of the Siberian rivers Ob and Irtysch to Central Asia and Kazakhstan through a canal. Scheduled to start in 1981, the project has been referred to, says Tass, as the greatest construction project in the entire history of Soviet land reclamation and water development. The canal will be 2,300 kilometers long and will help irrigate 36 million hectares of land in Kazakhstan in the so-called critical farming zone where rainfall is scanty.

CHINA'S BIGGEST SEWAGE TREATMENT vessel, the "Huangdao," has recently begun to operate in the Port of Shanghai. The 45,000-ton vessel is capable of purifying and converting oil and sewage into fuel oil and fresh water.

CHINA has recently launched two environmental monitoring vessels for observing the water quality, aquatic life, and siltation of the Songhua River in northeast China. They are to provide technical data to aid pollution control on the 1840 kilometer-long waterway.

The Songhua, with dozens of tributaries flowing through Jilin and Heilongjiang provinces, receives 6 million tons of industrial waste daily. It was identified by the state last year as an area needing pollution control urgently.

Three more monitoring vessels are now planned for this area.

Recycling ...

CZECHOSLOVAKIA is developing non-traditional energy sources, including using waste heat from nuclear power plants that the country hopes will supply 10 percent of its power needs by the year 2020.

The Ceteka news agency report added that programs for development of solar energy and biogas produced from the excrement of farm animals are also underway.

"Prognoses for the year 2000 envisage that Czechoslovakia will still have to import one-third of its energy," the report said. "Limitation of consumption growth and the use of new non-traditional sources are thus imperative."

FIVE HUNDRED SPECIALISTS from seven east and west European nations met recently in Szczecin, Poland, to discuss city cleaning and recycling. The Poles sought counsel on how to deal with their growing waste problems. Spokesmen said the amount of waste in Polish towns has doubled in the last decade and is still growing. Also discussed were ways and means of recovering valuable raw materials like paper, synthetics, glass and non-iron metals.

PAKISTAN'S FIRST BIO-GAS PLANT, with a capacity of 2,000 cubic feet of gas per day, will start functioning near Islamabad by the end of this year.

Officials say five more plants will be located in rural areas. With the introduction of bio-gas, the rapidly increasing consumption of imported kerosene in rural areas will be reduced.

The Energy Resources Cell will also set up 30 new family-size bio-gas plants (adapted from the Chinese model) during fiscal 1980. China has provided training facilities to Pakistani engineers. So far, 75 family-size bio-gas plants (capacity of 150 cubic feet per day) have been set up in the past three years.

THE FIRST 30-kilowatt biomass-fed power plant in the Philippines is now operating in the remote town of Kalayaan, Laguna. It generates electricity with fuel made from coconut husk, and makes electrification accessible to the great majority of rural residents.

The cost of electricity per kilowatt hour of the biomass-fed plant has not yet been determined.

Future commercial-size biomass-fed plants will be built and run by the country's electric cooperatives and wholly financed through loans from the National Electrification Administration (NEA) under a 30-year repayment plan.

Uses for the water hyacinth studied in eight countries



NAIROBI—New studies in eight developing countries—Bangladesh, Egypt, Fiji, Guyana, India, Malaysia, Papua New Guinea and Sri Lanka—are being coordinated to control and find uses for that beautiful but persistent pest, the water hyacinth.

The lavender-flowered water hyacinth (Eichhornia Crassipes) is an expensive weed in many parts of the world—because it proliferates so fast. Exhibited in New Orleans in 1884, it quickly established itself in the abundant water systems of Louisiana. Within 11 years the water hyacinth colony on the Saint Johns River in Florida—965 kilometers from New Orleans—was about 160 kilometers long.

The plant now covers about 700,000 hectares of waterways in Florida, Louisiana and Texas and costs the three states over \$11 million a year to control. Under favorable conditions, 10 plants can carpet a half-hectare of water within eight months.

It's a costly problem in other countries. The Sudan spends \$2.5 million a year for control, yet water hyacinths still disrupt river communications and reduce fish yields, and they cause heavy water losses because of the high rates of evaporation and transpiration.

So far, biological control measures have not been fully effective, and mechanical removal is expensive both in cash and labor.

But a better understanding of the plant is now emerging, a UNEP spokesman explained in Nairobi. The plant has the ability to absorb and concentrate heavy metal—such as lead, cadmium, mercury and nickel—and so can act as a biological filter for domestic and industrial wastes. It is also grown extensively in China for pig fodder. And experiments at the National Space Technology Laboratory in the US have shown that dried water hyacinth can yield useful quantities of biogas containing 60 to 80 percent methane.

The purpose of the new study program is to produce information that will make it possible to harvest and process the water hyacinth for productive purposes. The United Nations Environment Program and the Commonwealth Science Council have organized the project which is expected to be complete by the end of 1982.

CHARLES HARRISON

Official neglect in Sri Lanka ruins irrigation systems

COLOMBO—Thousands of Sri Lankan irrigation systems have been ruined because of official neglect, a top government official has charged.

More than half of Sri Lanka's 13,000 village tanks—irrigation reservoirs that have stored water for centuries—and about 10,000 ancient irrigation systems have been damaged. Lands and Irrigation Minister Gamini Dissanayake told the government this was due to government officials' neglect.

Since the responsibility was taken away from village headmen and transferred to government officials, structures like anicuts had been virtually "swallowed by the jungle," Dissanayake said. He asked for \$25 million for rehabilitation.

Agriculture in Sri Lanka's dry zone is largely dependent on village tanks that supply water for irrigation—and for domestic use. These reservoirs hold monsoon rains for use all year round. Dissanayake stressed that a third of the country's rice acreage depended on the village tanks for water. These fields accounted for 22 percent of the rice harvest.

Historians have recorded that Sri Lanka's ancient kings cared for their subjects by making the tank and the Buddhist "dagoba" (shrine) central to civilization. The bulk of the land under minor irrigation is in "purana" (ancient) villages. These farmers are generally poor and totally dependent on the village tank. In the past, village headmen organized a cooperative to keep the tanks in good repair. But since the government assumed responsibility for them, they have become nobody's concern and have gradually fallen into decay and disrepair.

Dissanayake urged the government to authorize basic investigations early next year. He suggested seeking World Bank, EEC and USAID assistance for undertaking the necessary studies and rehabilitation.

MANIK DE SILVA

Mrs. Marcos has called for comprehensive eco-protection

MANILA—Philippine Human Settlements Minister and First Lady Imelda R. Marcos recently convened the National Environmental Protection Council (NEPC) and called for a comprehensive environmental protection program stressing three priorities.

First, Metro Manila. Mrs. Marcos ordered an integrated environmental protection plan prepared for this area because of its concentration of population and industries.

Second, water protection and conservation. A portion of the Laguna de Bay will be set aside to take care of Metro Manila's industrial water needs. The NEPC will also pay close attention to the rivers and farmlands downstream to make sure they are not polluted by industrial wastes.

Third, reforestation and soil conservation. Various ministries will take care of the problem of maintenance of trees. New road contracts will incorporate a provision requiring contractors to plant trees along highways they construct.

SPECIAL TO WER

In Asia...

SQUATTERS in Sri Lanka have illegally occupied over 30,000 hectares of state land near streams, irrigation channels and forest reservations causing extensive damage to both the environment and to irrigation works countrywide, Lands Minister Gamini Dissanayake said.

Dissanayake, a keen environmentalist, commissioned a survey to determine the extent of encroachment on state property by landless people who cultivate the land. The results, just published, revealed that there were 345,504 such holdings covering a total of 204,536 hectares.

He says that squatters on reservations damage the environment and insists they be quickly evicted from the land they occupy.

The Minister wants to regularize encroachments on other state land: a one-hectare ceiling for the highlands and half a hectare for rice growing "paddy land" per family.

THE OVERSEAS MINERAL DEVELOPMENT COMPANY (OMRD), a Japanese joint venture with local companies in Malaysia, is paying for its pollution.

A complaint was lodged against OMRD that 1,210 hectares of padi land had been affected by pollutants from the Mamut copper mine, in operation since 1975. The Sabah government and the company have agreed to spend \$20.5 million in resettling and compensating the 620 families affected. OMRD will pay \$13 million and also be responsible for any further pollution compensation. In addition, OMRD has to spend more than \$40 million on environmental control facilities.

SOLAR ENERGY, terrestrial heat and coal liquefaction will account for about 5 percent of Japan's total energy supplies by the year 1990, according to the Ministry of International Trade and Industry (MITI). The government plans to spend \$6.88 billion for research and development of these energy sources over an 11-year period starting in fiscal year 1980. Eventually, these three energy sources will create a \$86 billion market which would require a workforce of 1.7 million, MITI said.

SOUTH KOREA is opening a new Environment Office on January 1, 1980.

Under the proposed environment protection law, the director of the new office will be given authority to request heads of related agencies to substitute or improve the use of fuels, regulate the use of agricultural chemicals, designate green zones, establish sewage disposal sites, order restoration of damaged land, and remove facilities on rivers.

Forestry ...

FOREST FIRES spread powerful and long-lasting cancer-causing agents over entire countries, a Spanish scientist told the first European Congress on Environmental Chemistry, which met in Madrid.

Dr. Gonzalez Baluja told delegates that contamination by forest fires is of increasing concern to environmental chemists who have "fully demonstrated" that intense heat releases polynuclear aromatic hydrocarbons—"many of them strong carcinogens"—that are blown over wide regions, even entire countries.

"The problem is so worrying that it is now the object of worldwide attention by scientists," he said. The second Environmental Chemistry Conference scheduled to be held in France next year will focus on the forest fire problem.

FIR AND SPRUCE BARK, pulverized and mixed with salt, is being used experimentally in the southern Polish region of Tarnow. According to recent reports, cattle thrive on it. There are many woodmills in the area, and if the new fodder definitely proves its value, all the bark, to date regarded as waste, will be utilized.

CHINA'S FIRST NATIONAL CONFERENCE on Landscape Gardening and Greenery reports encouraging progress in China's cities and industrial and mining centers. These include Zhengzhou in Henan province, central China, Nanjing city in Jiangsu province, east China and Guilin in South China.

The expansion of greenbelts and open space in these cities has helped control air pollution and improve the climate there.

THE HONG KONG government plans to embark on a 10-year landscaping program that will radically change the face of Hong Kong. It is estimated that under the \$6 million program, some 1.5 million plants are required annually over the next five years. In order to meet this demand, the government plans to expand its own plant nurseries and import plants extensively from China.

THE DWINDLING MANGROVE FORESTS in the coastal areas along the Malacca Strait have become a subject of concern in Indonesia. Not only is there possible damage to fish stocks, but also to the livelihood of fishermen in the country.

Also because of gradual humus erosion, farmlands in the area have become barren. Perhaps 20 million hectares in the region have become barren. If restored to their former fertility or if made fertile, they could provide a living for 10 million families.

Thailand's big reforestation program is well underway

BANGKOK—The Thai government wants to reforest one million rai (or 1.6 million square kilometers) of land during fiscal 1980, which began October 1.

According to Thanom Premrasmi, Director General of the Royal Forestry Department, 70 percent of the land will be planted with fast-growing softwood species, another 30 percent in teak and other slow-growing commercial hardwood species. Some softwood plantations will be used for watershed management.

About 360 million seedlings will be prepared for this purpose, with nurseries in every RFD provincial office serving as dispensing centers.

At the same time, Mr. Thanom announced that the RFD will step up its village forest program. "Slash and burn" cultivators and other illegal inhabitants of forest reserves will be encouraged to settle in designated areas where the RFD will assist them with housing and infrastructure.

Cultivators will "permanently rent" land to work and the government will retain title to prevent its sale. The renters will be paid a daily wage in line with the national minimum wage to plant trees in the areas surrounding their forest villages.

So far, 17 out of 33 planned projects have been completed, with more than 4100 families out of a planned 9600 tending and cultivating a collective area of nearly 100,000 square kilometers. Total target area for the program is more than 225,000 sq. km.

Official RFD statistics based on LANDSAT photos show that Thailand is 38.6 percent afforested, although only about 20 to 25 percent is classified as productive forest. Both figures indicate a rapid depletion of forest wood resources. KENNETH SNIFFEN



New environmental policies suggested for Amazonia

RIO DE JANEIRO—The ecological balance of the Amazon may change if systematic deforestation continues on a grand scale. This imbalance could lead to climatic changes yet little understood.

This is the summation of a report by the National Institute of Amazon Research (INPA) in Manaus. It will be submitted to Brazil's National Research Commission, the interministerial group charged with forming a new policy for the development of Amazonia.

The report underlines the ecological damage that the present slash-and-burn system has inflicted on the states of Acre and Rondonia. Erosion of the predominately sandy soil is the immediate outcome of deforestation. This encourages rapid runoff, beginning the long-term change in the Amazon ecosystem.

INPA's reports suggests policies to maintain the ecosystem: creation of a public or private entity with exclusive responsibility for Amazonia, establishment of schedules for the operation of industries involved in natural resource extraction, prohibition of commercialization of vegetable products, continued supervision of the area, continued emphasis on botanical study, study on endangered species and communities, creation of projects for fauna maintenance, the amplification of the national plan for parks and reserves.

GEORGE HAWRYLYSHYN

Food and alternative energy are Caribbean priorities

PORT-AU-PRINCE—The development of alternative energy sources and food production technology for rural areas were high on the priority list of the Caribbean Science and Technology Cooperation Committee which met recently in Haiti.

Participants considered, and in most cases approved, regional programs for energy, oil spill control, agroindustry, science and technology policy and planning, and the transfer of technology.

This Organization of American States committee, which coordinates science and technology programs in the Caribbean, heard reports from five task forces set up during the previous meeting in Santo Domingo in September 1977.

In the area of energy, the Committee decided to develop a sectorial plan linking energy to food production. Local scientists will work with government officials and local producers to analyze all aspects of the product from growing to marketing to distribution, to determine the technologies and energy sources most efficient for the separate stages.

The Committee approved the recommendations of a task force on a regional plan for oil spill control. This plan, created at a meeting in Port-of-Spain in May, 1979, involves the establishment of regional centers in Jamaica, Puerto Rico and Trinidad/Tobago to mobilize and coordinate rapid international assistance to any Caribbean territory affected by an oil spill.

In agroindustry, the Committee reviewed a critical analysis of programs in Barbados, Grenada and Trinidad/Tobago. The study will be extended to Haiti, Dominican Republic, Jamaica, Surinam, Dominica and St. Lucia.

The Caribbean Science and Technology Cooperation Committee grew out of a series of Caribbean Seminars on Science and Technology Policy and Planning organized by the OAS biannually since 1973. It officially came into being at Santo Domingo in September 1977. Representatives of several bilateral and international agencies also attended the meeting.

ART CANDELL

Nuclear Power...

BRITAIN is undertaking a comprehensive review of its radioactive waste management practices, the first since the Radioactive Substances Act of 1960.

A group of experts from the nuclear industry, the nuclear inspectorate and the Department of the Environment (DOE) have submitted a report to the DOE's Radioactive Waste Management Committee, which early next year will pass its comments on to the government.

The report expresses general satisfaction with existing waste management procedures and their effect on public safety but considers that expansion of the nuclear industry calls for extention of facilities and easing some controls.

Environmentalists have much less faith in the efficiency of waste management and consider the report's reassurances "meaningless," said Friends of the Earth spokesman, Mike Flood.

A LEADING SOVIET party magazine has warned readers that the country's massive nuclear power projects could endanger the environment.

The October 14th edition of "Kommunist" carried an article charging that nuclear power stations swallow up too much farm land and water, that nuclear waste is difficult to store, and that radiation could leak in the case of accidents in transporting used nuclear fuel.

The tone of the article, entitled "Atomic Energy: Accomplishments and Problems," was unusually frank and contrasted sharply with the usual optimistic reports in the Soviet press.

FRANCE'S NUCLEAR POWER program suffered a temporary setback in October when workers refused to start fueling two plants after cracks were found in metal components. Significantly, the work stoppage was backed by French unions, which officially support nuclear power.

France's state-owned national utility, Electricite de France, has 16 nuclear power stations in operation and is building 33 more scheduled to enter service in the 1980s. It is Western Europe's most ambitious nuclear power program. The EDF eventually overrode workers' opposition and started fueling the two plants, but the union protest is the first significant opposition ever manifested in France to nuclear energy.

AN ANTI-NUCLEAR-POWER group has claimed credit for setting off explosives at a Swiss nuclear power plant near Soleure the night of Nov. 3, causing an estimated \$625,000 in damages. After an in-depth inspection, the Goesgen nuclear power center was put back into full operation.

Conservation ...

THE CZECHOSLOVAK PARLIAMENT has called for energy conservation and pointed out that national fuel consumption is the third highest in the world at 6.8 metric tons per capita a year.

The Peoples Plan and Budget Committee declared that there must be more systematic application of the latest technical achievements in households and throughout the economy. Greater use of secondary resources, such as industrial waste and recycling of waste heat was also recommended.

In this way some seven million tons of fuels could be saved by the year 1990—about five percent of the total energy consumption—according to the Committee.

Construction of 30 waste-burning plants is planned and heat generated in compressor stations of the long-distance natural gas pipeline will be used to heat greenhouses and drying plants for agricultural produce in southern Moravia.

Solar energy—in coordination with other resources—is expected to account for 3 percent of total energy requirements by the end of the century.

CHINA HAS SAVED 760,000 tons of oil by switching to coal consumption in the first six months of this year. The metal industry has saved another 120,000 tons and oil-using factories in Shanghai, Tiajian, Peking and other areas have worked out measures that cut consumption by more than a fifth.

SRI LANKA'S Fisheries Minister, Festus Perera, has proposed that sails be substantially subsidized in an effort to persuade fishermen to conserve fuel by reverting to the use of sails.

Perera told WER that there were around 3,600 mechanized traditional craft, mostly outrigger canoes known here as catamarans. According to government statistics there were also 14,500 non-mechanized craft.

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Reducing energy demand is top priority, says EC official

BRUSSELS—"I firmly believe that our top priority must be the reduction of energy demand," said European Community Energy Commissioner Guido Brunner, opening a commission-sponsored symposium—"New Ways to Save Energy"—held here in late October.

Some 800 participants heard 100 scientists talk about energy-conservation projects carried out under the community's first Energy Research & Development Program (1975-79). Proceedings of the meeting and complete results of the R&D program will be available in early 1980.

Energy consumption has gone down since 1973, said Brunner. Even so, a commission-appointed panel recently concluded that by the year 2000 the Community could save even more: 15 percent in industry, 30 percent in transportation and 50 percent in the household and service sector.

Proceedings of the symposium and results of the EC's first Energy R&D program can be obtained by writing Mr. P. Zegers, Commission of the European Communities, DG XII - C1, rue de la Loi 200, 1049 Brussels, Begium.

GARY YERKEY

Pakistan continues to develop energy—with UNDP aid

ISLAMABAD—The Energy Resources Department of Pakistan's Ministry of Petroleum and Natural Resources will establish four additional energy centers in the country at an estimated cost of \$1.8 million.

The centers will be financed by the United Nations Development Program grant for renewable energy development.

The project will develop an integrated system of shore wind, biogas and solar energy. Power will be combined in a small energy bank to meet the requirements of lighting, irrigation and small agricultural units such as flour mills.

The centers would also supply biogas for cooking to reduce consumption of kerosene.

This operation is expected to double the income of the project area and reduce migration to cities.

The Energy Resources Department is also in the process of establishing 16 smaller rural energy centers using wind energy, bio-energy, solar and geothermal energy.

There are already many small biogas plants in the country.

Minister for Petroleum and National Resources, Lieutenant General F. A. Chishti is emphasizing the need for conservation of petroleum. He has called upon experts to give suggestions for an import bill on petroleum.

Pakistan's oil import which was \$67 million in1972, will reach a level of \$935 million in fiscal 1980.

MOHAMMED AFTAB

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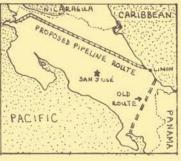
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Costa Ricans protest cross-country pipeline

SAN JOSE—Costa Rica's media have exploded in a vitriolic national debate on the government's surprising proposal to hear offers for a new trans-isthmanian pipeline which would handle the crude oil from Alaska and South America. The pipeline would run through important tropical rain forests, already a source of worry to conservationists since they are being deforested at an alarming rate.

A 1974 proposal, which was killed, planned to utilize a 200-meter-wide strip of land running a shorter route from the Golfo Dulce on the Pacific to Cahuita on the Caribbean (the latter area has since been declared a national park and includes a 600-hectare marine park). The present plan is to run the pipeline from the northeastern corner of Costa Rica, near the Nicaraguan border, to the existing nationalized oil terminals at Moin, a few kilometers north of the country's major Caribbean seaport, Port Limon.

Environmental impact isn't the only reason for opposition here: A recent history lesson has been learned from the Panama Canal next door. It has aroused fears that the pipeline might become an international issue and, thus, possibly endanger the political autonomy of this small democratic nation. The army was abolished here in 1949.

Questions are also being raised as to why the United States has to export its ecological degradation and is apparently unwilling to take on the risks of solving its own distribution problems. At present, Alaskan oil from Port Valdez is trans-shipped through the Panama Canal to the East Coast of the U.S. Even with modern installations in Panama, only 300,000 barrels go through the canal daily, a far cry from present demand requirements. The pipeline would carry two million barrels daily.

Another factor very much feared by ecologists is the possibility of a future oil spill in the rich Atlantic Zone which harbors some of the world's outstanding rain forests with remarkable flora and fauna still relatively intact. The zone is criss-crossed by a maze of rivers, natural waterways and man-made canals. It would be physically impossible to clean up after an oil spill in this area, which also serves as the spawning ground for an enormous amount of marine life. The area encompasses nesting grounds for the rapidly disappearing green turtle.

Renewable Energy...

SWITZERLAND has just begun a six-month experimental program to determine what contribution solar energy could make to this Alpine country's overall energy production.

The first step—already begun—is collecting data and projections on a solar collecting station to be located in the high Alps, the only region to receive a sufficient amount of solar rays throughout the entire year.

A French-built heliostat will be installed in the Alps near Davos and plans call for more to be constructed in the same area.

The 750,000 Swiss franc (about \$468,750) project will collect data on the feasibility of expanding solar energy use and this information will be fed into the country's Global Conception of Energy Plan (CGE).

THE CHINESE SOLAR ENERGY Society was set up recently. A total of 29 council members was elected—with one vacancy reserved for "the province of" Taiwan.

THE SOUTH KOREAN GOVERNMENT will take measures to assist domestic business interests producing materials needed for solar houses.

These measures include tax incentives and grants of a total of \$3 million to those local firms meeting the selective standards.

Since the announcement of these incentive measures, the three local business firms which produce such materials have been competing to get their manufacturing licenses from the government.

THE SOUTH KOREAN GOVERNMENT will provide \$2 million in special housing loans to South Koreans who want to build solar houses. The loans, amounting to \$10,000 for each house, will be extended to those who want to build solar houses that are less than 132 square meters in area. At present, the government is giving the special housing funds only to those who build solar houses less than 83 square meters in size. The loan will be redeemable over 19 years with an annual interest rate of 16.5 percent after a one-year grace period.

THE FEDERATION OF HONG KONG Industries has recently urged the government to look at alternative sources of energy to fight the spiralling cost of oil.

Oil imports from January to April this year cost \$220.6 million—\$39.6 million more than the same period last year.

The Hong Kong government is looking into the possibility of using nuclear energy. President Rodrigo Carazo, who entered office in May 1978 with a major conservation and reforestation program, has stated that the proposed pipeline would be very beneficial to the country and that if Costa Rica doesn't build it, one of the other countries of the Central American isthmus will. He also was quoted as saying that "any major oil spill in a neighboring country would also affect us."

Several prominent businessmen have come out in favor of the project and point out the financial benefits to the country, but the majority of Congressmen questioned have so far ranged from very violent opposition to delivering a complete swath across the country to "voracious foreign monopolies in the style of the Panama Canal," to the more temperate points of view calling for an exhaustive study of the proposal before any firm commitments are made.

MURRAY SILBERMAN

Italy is building a pipeline under the Mediterranean

ROME—In Italy, there appears to be no environmental opposition to a trans-Mediterranean pipeline that will carry natural gas from Algieria via Tunisia to Italy.

By 1981, the 2,575-kilometer-long pipeline will bring more than 12 billion cubic meters of natural gas a year to Italy, which now uses slightly more than 27 billion cubic meters annually—half from abroad.

From Italy, the Algerian gas could reach several central European countries in the near future. The national gas company SNAM has already linked Europe's "boot" to the Netherlands and Soviet Union with two trunklines. The trans-Mediterranean gasline will be a new trunkline in the European network and may benefit Switzerland (negotiations between the Swiss and Algerians are now going on) and possibly Greece, Austria and Yugoslavia. To supply them, the trans-Mediterranean pipeline would have to be enlarged.

Pipeline proponents say that use of the gas will help the environment in Italy since methane, a main component of natural gas, burns cleaner, a help in heavily industrialized areas. On land, the lines are underground and their route reafforested where necessary.

SNAM says the 161-kilometer-long undersea section, which runs from the tip of Tunisia to Sicily, poses no environmental problems, as the pipe is laid on the flattest possible route to prevent sagging, even at the cost of a longer pipeline. The 20-inch-diameter pipes will be sunk to a depth of nearly 610 meters at one point where SAIPEM, which is laying the undersea section, has to bridge a rift in the Sicilian Channel. To prevent accidental damage, the pipe will be coated with a heavy layer of concrete where water currents are strongest and with anti-corrosive polyethylene for the remainder.

Excluding the Algerian section, the pipeline is expected to cost \$3 billion over five years. VITTORIO PESCIALLO

Mexico's Ixtoc-1 under control but spill effects are unknown

MEXICO CITY—Sporting a new "sombrero" and with its habitual smoking under control, lxtoc-1 is preparing to bid Mexico, and the world, goodbye. Sometime this month, the runaway offshore Mexican oil well should stop gushing oil into the lower Gulf of Mexico.

It is retiring with a world record but with many ecological questions still unanswered: Since it exploded June 3, Ixtoc-1 has poured more than two million barrels of crude oil into the seas. Despite this, environmental experts around the world remain uncertain about what, if any, lasting ecological damages were caused.

There are two reasons for the reduction in flow: the insertion of tens of thousands of metal balls into the well and its crowning with a massive "sombrero" or hat.

The 50-foot-high sombrero, an inverted funnel weighing 305 tons, like the insertion of metal balls, was the idea of Jorge Diaz Serrano, director of the Mexican petroleum industry, Pemex.

The sombrero collects the gushing oil at or near its source. Through a system of hoses and tubes, powered by pumps, oil is separated from the sea water, and natural gas—until now burning on top of the water—is captured and burned off atop a tall smokestack.

Sea water is returned to the sea; oil is collected in tanks on the sombrero platform, then transferred to tankers for shipment to a Mexican refinery.

Two wells being drilled to the seabed where Ixtoc's oil is escaping are almost completed. When finished, they will take over the pumping of the oil and the sombrero no longer will be needed. At that moment, the Ixtoc-1 spill will cease to exist, except in the record books and as an unpleasant reminder to the world that the cost of energy is exceedingly high.

KATHERINE HATCH

World oilmen call for energy conservation

BUCHAREST—The 10th World Petroleum Congress ended here with a call for greater efforts toward "wise use and conservation" of dwindling oil and gas supplies.

WPC president Wilhelm von Ilsemann of West Germany said conservation would be the major theme of the next congress, scheduled for London in 1983.

The Congress is a nonpartisan organization of petroleum experts which meets every four years to exchange technical information. The Congress heard a number of experts predict that only half the world's gas and oil supplies have been discovered. Vast untapped oil and gas supplies were said to lie hidden in the Arctic and the ocean depths, but the price of developing these resources will be high, they said.

SPECIAL TO WER

Water Quality ...

THE NIGERIAN GOVERNMENT is sponsoring a seminar and workshop on the environmental effects of the petroleum industry on the Niger Delta. All the major oil companies with interests in Nigeria have been asked to present papers on such subjects as the impact of oil production on the biota of the delta, the monitoring system, oil-spill contingency plans, off-shore surveillance and effluent treatment. The Nigerian National Petroleum Corporation Inspectorate will discuss environmental problems and solutions, and the Ministry of Industries Environmental Planning & Protection Division will give a paper on legal aspects of oil pollution. Field trips to selected sites will be taken on the third and final day of the workshop, November 30.

ALTHOUGH THE VENEZUELAN OIL industry is said to be extremely careful about spills, conservationists and residents alike are concerned about a new crude oil site off Margarita island, famed since the journeys of Columbus for pearls of the highest quality. The oyster banks have decreased in production although exploited only once every five years.

Underlining the dangers, a Liberian tanker carrying 80,000 tons of crude was grounded in October off the coast of Margarita, spilling 5,000 tons before Maraven Oil Company dispatched equipment and specialists to tow away the ship and minimize pollution.

THE BRITISH GOVERNMENT has been strongly criticized for the "lack of importance" it attaches to the problem of marine pollution.

The criticism comes from Robert L. Trillo, editor of Jane's Ocean Technology, the acknowledged authority on marine equipment, writing in the 1979/80 edition of the publication, which was recently published.

The £1.5 million (\$3.29 million) made available by the government for extra anti-pollution equipment at the end of 1978 represents approximately 1/5000th of the current year's earnings from the North Sea, or 5 cents a year per head of the British population, he said. Total containment and collection systems are needed to cope with the pollution, he suggests, and the technology exists to develop these. Investment in them would be much less expensive than the clean-up bills which can be expected over the next few decades.

1978/79 was described by chairman Lord Ritchie Calder in the annual report of the Advisory Committee on Oil Pollution of the Sea, as "the year of the worst pollution incidents ever recorded" around the British coast.

Environmental Management . . .

UNESCO has published a guide to world research on environment, technology (including appropriate technology), energy, housing and health. The book lists research projects, organizations, newsletters and information services in these fields. This "Bibliography on 'Research and Human Needs'" is part of a wider UNESCO campaign to "help the world's societies become more effective learning systems and adopt applied research for more harmonious change." The Paris-based organization is also establishing a computer data base for retrieval of information on research related to human needs.

Inquiries and input are welcome, UNESCO says. Free copies of the 145-page bibliography can be obtained from: Division of Scientific Research, UNESCO, Place de Fontenoy, 75007 Paris, France.

AN ENVIRONMENTAL MEETING of the Association of Southeast Asian Nations (ASEAN) held recently in Malaysia recommended that all new ASEAN industrial projects be subjected to detailed environmental impact assessments.

MAJOR LATIN AMERICAN international development groups met recently in Washington, D.C., and reached significant agreement on principles for wedding environmental awareness to development of the region.

Sponsored by the United Nations Environment Program (UNEP), the Fifth Interagency Consultative Meeting on the Environment in Latin America gave the on-going negotiations a "new lease on life," one participant said.

Building on basic principles agreed to last September in Paris (WER, Oct. 8, p. 1), delegates produced five "operational guidelines" for consideration by their organizations. They called for early analysis of the environmental effects of economic development, guides for preparing development projects and a system to evaluate the economic impact of environmental protection. Also recommended are strengthened training programs on the environmental sciences and dissemination of information on how to weave environmental concerns into economic development.

Antarctic treaty nations inch toward agreement

WASHINGTON—Thirteen nations* who hold the future of Antarctica in their hands inched toward agreement on the two most controversial issues concerning the continent—how to protect living resources and how to prepare for and manage possible mineral exploration and exploitation.

In their 10th consultative forum, delegates paved the way for a formal diplomatic drafting session tentatively scheduled for Canberra in early 1980.

The proposed Marine Living Resources Convention would set an agenda for new environmental research and possibly for rules to protect the Antarctic's vulnerable ecosystem. While agreement on a minerals convention is well down the road, a cautious step has been taken toward avoiding a land rush that would benefit only a few and outrage many.

Some ticklish diplomatic maneuvering was necessary during the three-week, behind-closed-doors meeting here before the delegates could return to their capitals for ratification of the latest proposals. Foremost among the problems was France's undisputed claim to islands within the proposed living resources convention area around Antarctica. In past discussions, France wanted to remove these islands, Kerguelen and Crozet, from the convention or at least insert language to guarantee absolute French control. Complicating the issue was the possibility that France might claim a 200-mile economic zone around the islands, which could allow countries that claim sovereignty over wedges of the continent to do the same. But in a short, six-paragraph paper agreed to at the 10th meeting, France was given, in effect, veto power for its islands over any future conservation measures adopted by a living resources convention and total right to craft its own measures for the islands.

"I think this is inconsistent with the eco-system approach," said one observer at the meeting, "but countries are very jealous of their sovereignty." A U.S. participant noted that single countries have veto power over any agreement under the 1959 Antarctic Treaty anyway.

The other stumbling block has been the role of the European Economic Community. The EEC wants to be involved as a full partner while treaty powers, notably the Soviet Union, have been opposed. The four EEC countries scheduled to be part of the convention—Belgium, France, West Germany and the United Kingdom—have different and opposing territorial interests in the Antarctic and reportedly aren't enthusiastic about EEC participation either. The powers now have decided to allow EEC participation during any formal diplomatic convention—the EEC will debate and vote alongside its member countries.

Aware that several countries, especially the U.S., are eager to begin exploration, the powers recommended that they seriously

^{*}Treaty powers—Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, Poland, South Africa, USSR, UK, USA.

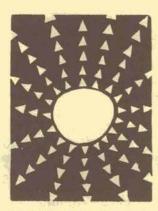
consider a "mineral resources regime" that would regulate exploitation. As seen now, such a regime would assess the impact of mining on the Antarctic environment, determine whether extraction will be acceptable and establish environmental protection rules. Delegates were asked to recommend increased research by their governments to get a better picture of the possible effects of exploitation.

Up until now, the strongest opposition came from environmental groups, but James Barnes, spokesman for conservation groups and a delegate to the Washington meeting, was guardedly optimistic. "They came up with a recommendation that is fairly strong on environment but also strong on mineral development. Now there is general agreement that establishment of a regime does not necessarily mean there really will be mining....Given what could have happened, I'm satisfied."

Barnes said he thought there would probably be both international authority and some level of national sovereignty. Delegates also weighed the possibility of including Third World countries, he said, and looked "realistically" at revenue sharing.

Barnes is working outside the U.S. delegation to pursue environmental controls, acting as counsel to the newly formed Antarctic & Southern Ocean Coalition. Representing several international groups, ASOC plans to send letters to the heads of every treaty state asking for a stronger commitment to environmental research and for changes in the draft document that would strengthen environmental protection language. It will urge participation by non-governmental organizations in the Canberra meeting.

CHRIS JOYCE



Outback town to get world's first solar power station

PERTH—Australian scientists claim they are building the world's first high-temperature, high-concentration solar power station. It will supply electricity to the tiny township of White Cliffs (population 50) in western New South Wales.

The \$800,000 solar power station is being built by scientists of the Australian National University who were commissioned by the state government last May. Work has already begun.

Fourteen pairs of solar collectors will supply super-heated steam to an engine that will drive an alternator with a 25-kilowatt output.

For added economy, the "waste heat" will be used to desalinate water—a big plus in an area where water is a precious commodity.

The solar station replaces diesel-fired generators and should be operational in 18 months.

JANE NACZYNSKI-PHILLIPS

Down Under...

IN AUSTRALIA, a University of New South Wales research team has devised a faster method of producing ethanol, utilizing a bacteria which reduces current processes to one-third their present time.

Dr. Peter Rogers reports that instead of using yeast in the fermentation process, the bacteria zymonoras mobilis (which is blamed for that "off" taste in beer) is used. In the continuous process, the conversion of crops could take 1½ hours instead of four; using the "batch" method, from 30 hours to as little as 10.

Rogers estimates that by using the bacteria, smaller fermentation units are needed. The faster time could cut capital costs by up to 30 percent—and the cost of ethanol fuel by several cents a liter. Ethanol now costs 30-45 cents per liter to manufacture. The team estimates that 20 percent of Australia's motor-vehicle fuel needs could be met by the installation of 20 plants, each producing 150,000 kiloliters of ethanol per year.

And the bacteria can be recycled.

A DISUSED SYDNEY BREWERY is headquarters for an Australian \$1 billion-a-year project in which 4.4 million tons of alcohol fuel will replace 20 percent of the country's gasoline imports.

Australian oil company Ampol Petroleum Limited and Biotechnology Australian Proprietry Limited are joint-venturing on the ethanol plant which is already producing 1100 tons of yeast protein from grain each year. This plant near Sydney will be expanded at a cost of \$5 million.

Six commercial units are to be set up in Australia's grain-growing areas to produce ethanol.

THE WEST AUSTRALIAN TOWN, Witenoom, which was to be relocated because of the health risk from asbestos tailings, has won a reprieve—perhaps its citizens will be as lucky.

The state government has bowed to the wishes of Witenoom's 150 residents who have adamantly refused to leave the former asbestos mining town, some 1500 kilometers north of Perth.

As reported in WER (January 15, 1979, p.8), the state had decided to close the town because of the health risk of airborne asbestos tailings. Some Witenoom mine workers had developed asbestos-related diseases through the years.

But the people of Witenoom want to stay, and so Health Minister Ray Young announced that the government would respect their wishes.

In Africa ...

FOLLOWING THREE INCIDENTS concerning the handling of sodium cyanide—all within a month—the South African government has ordered urgent changes in control measures. The incidents included two spills and one punctured drum with its contents missing.

The government is considering asking foreign manufacturers to pack the chemicals in puncture-proof drums in the future.

Cyanide is used in large quantities in extracting gold from ore.

A CRATE of "laboratory clean" oysters has been lowered in Durban Bay—South Africa's second largest harbor—to monitor heavy metals and chemical pollution. Oysters are noted for the way their bodies retain toxic substances such as flouride and cadmium as well as pesticides such as DDT (still used for malaria control).

It has been found that 1.5 milligrams per cubic decimeter of fluoride occur naturally in seawater and is beneficial. Just over double that actually stimulates amphipod growth. Five mg/dm³ and above adversely affects them. In some areas of the east coast—especially near aluminum smelters and phosphoric acid plants—effluents are as high as 30mg/dm³, constituting a serious threat to marine life. The National Institute for Water Research is trying to arrive at recommended permissible concentrations.

ALARMED BY THE NEAR-EXTINCTION of Uganda's vast reserves of wildlife, Tourism and Wildlife Minister Obuwa Otuwa announced a five-year ban on all hunting.

He said the depleted game herds must be built up. Uganda needs studies to show the current state of these herds, and the government wants to rehabilitate game reserves (and the tourist industry) with the help of international organizations. At the same time it will mount an intensive campaign against poachers and educate Ugandans against poaching wild animals.

An international outcry had been raised against the continued slaughter of game in Uganda, for which Tanzanian troops now stationed in that country have been largely blamed. The herds had been diminished greatly under Idi Amin's rule also.

Kenya politicians run on an environmental manifesto

NAIROBI—The ruling Kenya African National Union (KANU) has emphasized environmental questions in its manifesto issued for the November 8 Parliamentary elections.

This is the first time the environment has figured so prominently in declarations of Kenya's only political party.

KANU promises to give high priority to educating Kenyans about their own environment and how to preserve it. "It is less costly to prevent harmful environmental effects than to correct them once they have occurred," the manifesto states.

New laws for the conservation of wildlife and its habitat will be introduced.

Large areas of Kenya are semi-arid and thinly populated. Increasing pressure on the more fertile areas is focusing attention on expanding the present use of arid and semi-arid areas. KANU undertakes to increase the pace of development in such marginal areas—but with full regard for the preservation and enhancement of the environment.

CHARLES HARRISON

Uganda water system also suffered under Idi Amin's rule

KAMPALA—Uganda must rebuild its water supply systems or its population will face grave health dangers, according to a team of Commonwealth experts.

They found that the water supply and sewerage systems for this capital city and for Jinja and Entebbe are practically non-operational after years of neglect under the regime of Idi Amin. Water is being pumped from Lake Victoria inlets dangerously close to the points from which raw sewage is being discharged. This water is virtually untreated.

Sponsored by the Commonwealth Secretariat, the team surveyed economic conditions in Uganda after the fall of Amin last April. The warning on water was included in its report. The team was headed by Professor Dudley Seers of the Institute of Development Studies at Sussex University, England, and by Sir Egerton Richardson of Jamaica, former ambassador and industrialist.

Kampala is the most urgent case. The water supply from Gaba (10 kilometers from the city center, on the shore of Lake Victoria) meets only about half Kampala's needs and "coarse meshes and micro filters do not work, nor do half the gravity sand filters or the chlorine injection system."

The Kampala sewage plant is "virtually non-operational," and a similar situation exists at Jinja, Uganda's second biggest city. Raw effluent flows to Lake Victoria, only 5 kilometers from the intake to the Kampala City Water Supply at Gaba.

Officials in Kampala say efforts are being made to improve the situation.

CHARLES HARRISON



Zimbabwe Rhodesia refugees deforest land to keep warm

SALISBURY—The latest victims of the Zimbabwe Rhodesia guerrilla war are trees.

Refugees who pour into the cities to avoid almost daily visits to their villages from security forces or guerrillas, are denuding parklands of any burnable trees they can lay an ax to. The refugees have just gone through three months of cold winter nights under their canvas, tin and cardboard roofs.

Enterprising city Africans with trucks are making night forays into nearby farmlands, returning with black market wood.

Salisbury city fathers are left surveying many acres of denuded land, with spring winds whipping up the dust, as they wonder what to do with an influx of nearly 10,000 people.

The Salisbury Promotion Council has begun a "plant-a-tree" campaign. But most species take 25 years to reach maturity, and unless the war ends and the people can go back to the tribal areas—and even there wood is becoming scarce—they will probably burn the saplings. JOHN KELLEY

South Africa exports uranium while debating nuclear power

JOHANNESBURG-The Three Mile Island incident is not expected to have much impact on the sale of South African uranium, say experts here.

Last year South Africa sold 4,500 tons; by 1985 the Chamber of

Mines expects to export about 10,000 tons.

South Africa's own needs are minimal. Its projected (first) nuclear reactor near Cape Town, now due for operation in 1983/4, will require about 750 tons for the initial charge with a further 350 tons or so each succeeding two-and-a-half years. A second nuclear power station is not being contemplated at the moment, according to Electricity Supply Commission (Escom) spokesmen.

Meanwhile the first signs of real antagonism towards nuclear power here became apparent in mid-September when Escom announced it had found faulty components supplied by the French manufacturers.

The Star newspaper in Johannesburg asked if South Africa really needed a nuclear power station seeing that the decision to go nuclear, made in 1976, was based on coal reserves figures which had since been upped five-fold—supplies that will last at least another two centuries. JAMES CLARKE

Forestry ...

A 683-PAGE VOLUME, Tropical Forest Ecosystems—A State of Knowledge report—has just been published by UNESCO.

Compiled in consultation with other UN agencies, the report took five years to prepare. It provides a clear summary of the present state of knowledge on the structure, functioning and evolution of tropical forest ecosystems. It attempts to identify gaps in knowledge, make recommendations for future research and describe examples of land and resource management-successes and failures.

The English version is already available; French and Spanish versions are being printed as well. It is available in all countries from UNESCO sales agents at a price of \$35.

FOR THE FIRST TIME in the Philippines' forest conservation history, reforestation has outpaced deforestation, government sources said. The causes of this positive development include: the release of government funds for reforestation projects, implementation of the citizen tree planting program, the government's all-out campaign against illegal logging and the cooperation of timber licensees in forest renewal.

Last year's tree planting activities covered 78,425 hectares while forest destruction was reduced to 69,958.

THE MALAYSIAN PENINSULA will exhaust its timber resources within 12 years if logging continues at the current rate, says Abdul Razak Majid, Director-General of the Malaysian Timber Industry Board. Currently 1000 hectares are logged daily. Forest resources of the east Malaysian state of Sabah are expected to last five years longer, as the logging rate there is less, at 405 hectares a day.

In the east Malaysian state of Sarawak the situation seems less severe, as the rate of felling trees there is less than 201 hectares daily and it has twice as much forest land.

THE WORLD'S ONLY NATURAL tuart (Eucalyptus gomphocephala) forest, near Busselton in the southwest of Western Australia, is undergoing a six-year restoration and conservation program.

The forest covers 2,880 hectares and one aim of the program is to develop the forest for recreational use, as well as conserve this unique woodland.

In Europe ...

FEARS of West Germany's major political parties that environmental groups might be a swing factor in the next nationwide elections (WER, Sept. 24, p.1) were confirmed October 6-7 when, for the first time, an environmental "green list" was elected to a state legislature.

The "green list" earned 5.14 percent of the vote in West Germany's smallest state, Bremen, and won four of 100 seats in the legislature. The environmental group achieved this even though it had to compete not only with the established big three parties, but also with the Maoists who had defected and set up a rival, so-called alternative list.

The alternative list won 1.36 percent, which means that "green" groups racked up a total of 6.5 percent.

The "green wave" appears to have attracted many younger voters—the country's political future in the eyes of party strategists.

IRELAND'S ENVIRONMENT COUNCIL has published its first report, which calls for a national overall policy on the environment.

Broad national strategies governing industrial and other developments and strict controls on development of remote areas of great natural beauty are urged.

The 19-member Council suggests that some parts of the country might be declared unsuitable for industry.

Environment Minister Sylvester Barrett revealed that a "fairly comprehensive" new bill on environmental matters is in preparation. He also asked the Council to look at the increasingly difficult litter problem in Ireland.

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The Center is a non-profit, non-advocacy, educational organization which seeks to foster public understanding of global environmental issues. Established in 1974 by the UN Association of the USA with the support of the UN Environment Program (UNEP), the Center alone is responsible for WER's contents.

Britain's environmental budget slashed by government

LONDON—Britain's Department of the Environment got the deepest cut in the Thatcher government's much-publicized axing of quangos (Quasi-Autonomous Non-Governmental Organizations). The number the department is responsible for was cut from 119 to 58

Announcing his decision at a press conference, Secretary of State for the Environment Michael Heseltine said he expected the cut-backs to save £1.4 million (\$2.69 million) a year. The saving was described as "peanuts" by Labor opposition spokesman Roy Hattersley, who saw the whole issue as "an exercise in public relations."

For some it is a salutary review of organizations which can easily outlive their purpose. Others fear a few important environmental guardians may have been lost along with the deadwood.

But environmentalists are much more concerned about two other government cuts announced almost simultaneously—and with much less publicity. The long-awaited implementation of Part I of the 1974 Control of Pollution Act—comprehensive planning and regulation of waste disposal by local authorities—is to be deferred once again. It would place too great a burden on localities, says the government, at a time when they are being asked to reduce their current expenditure by 3 percent.

The environment department's budget as a whole was cut by £440 million (\$946 million). £55 million of this (\$118.25 million) is to come from the hard-pressed Regional Water Authorities whose outdated plant and machinery is barely able to keep pace with water quality and sewage treatment standards.

BARBARA MASSAM

Norway has a new minister and budget for the environment

OSLO—In a major government upheaval, Prime Minister Odvar Nordli appointed former Defense Minister Rolf Hansen, 59, to replace Mrs. Gro Harlem Brundtland as Environment Minister. Mrs. Brundtland, the Labor Party's deputy leader, goes back to the Storting (Parliament).

Just hours before the cabinet shake-up, outgoing Minister of Finance Per Kleppe presented the 1980 State budget. It includes total Environment Ministry expenditures of \$133.5 million: \$30.6 million for air and water pollution projects, \$5.4 million for protection of the environment and recreation areas, \$6.4 million for oil pollution protection. Wildlife protection gets \$6.7 million including protection of natural parks. \$5.5 million goes to the State's Pollution Control Agency.

Norway's successful car junking program will be continued and the refundable deposit to be paid for all newly registered cars will be increased from \$100 to \$115.

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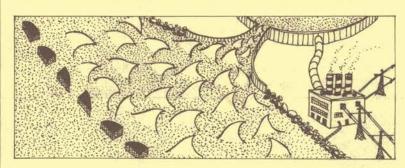
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Norwegian power system seeks to bend the force of waves



OSLO—Norway has opened the world's first test plant designed to harness energy by focusing ocean swells into concentrated waves—a process analogous to the light-focusing mechanism of a camera's wide-angle lens.

The method was developed during eight years of research and experiment at Norway's Central Institute for Industrial Research (SI) in Oslo. The test plant, where further experimenting will continue with government financing, was started up August 31 by deputy energy minister Trygve Tamburstuen.

The tests take place at 1:100 test scale on a 150-by-100-meter artificial lake outside Oslo.

More than \$3 million have been spent on the project so far, including \$1 million for the construction of the test plant which consists of a wave energy laboratory, the lake, a wave-producing generator pump and the lens system to focus swells into waves.

A common feature of all earlier ocean energy proposals and experiments is that they aimed at extracting energy directly from the incoming wave front at coastlines.

The Norwegian SI system, however, concentrates the energy of the constant ocean swells over distances up to 10 kilometers into forceful 15 to 30-meter-high waves.

This wave-energy method will include large funnel-shaped chutes into which the concentrated waves would enter and be channeled up into water reservoirs located as high as 100 meters above sea level, and then flow down to generate hydroelectricity at a power plant located at sea level.

According to recent measurements, the average energy contained in North Atlantic swells along the coasts of Europe is between 200 and 800 megawatts per 10 kilometers, an enormous energy resource.

Mehlum said at the opening of the test plant that just one of these power plants concentrating swells over 10 kilometers at the Norwegian coast would generate sufficient electricity to supply one fifth of the total consumption of the Norwegian capital city of Oslo.

SPECIAL TO WER

In Europe ...

THE DUTCH HAVE FAILED so far in their voluntary effort-begun last April-to reduce oil consumption by 5 percent. They cut consumption from April through July by only 2.5 percent, said a report released in the Hague by the Economics Ministry. Projected total oil consumption for 1979 has been estimated at 30.7 million tons.

A LOCAL ENVIRONMENTAL PARTY startled Swedish politicians by winning three seats in the recent Stockholm communal election. Consequently, it holds the balance of power at City Hall between the major blocs. The Socialists and non-Socialists each took 49 seats.

The new Stockholm Party dealt mainly with environmental questions during the campaign. One main plank in its program is that automobile traffic in Stockholm's inner city "must be halved at least." It proposes a toll system for entry into central Stockholm. The party also opposes nuclear power, proposing a "sensible" energy saving program instead.

BRITAIN'S Department of Trade is planning a program of research into certain types of windassisted ships as a fuel-saving measure.

It will look into the commercial possibilities of using wind power, such as a single sail or a vertical-axis wind turbine, as an auxiliary to diesel engines. A report in the Guardian newspaper points out that this is a reversal of the historical development when engines were first used to maximize the efficiency of sail.

THE IRISH are using waste heat from electricity generation to start food-growing projects.

The national Electricity Supply Board (ESB) has started a project for growing vegetables and is planning a fish-farming scheme near two of its power stations.

At Lanesboro in County Longford waste heat from the local power station heats a horticultural project which may eventually grow into a produce industry. The National Research Authority, the Agricultural Institute, and the Bank of Ireland have joined with the ESB in building greenhouses on a site adjacent to the power station. Private interests will be invited to take over the project and develop it, with loans provided by the bank.

In County Kerry the ESB is working on a plan to provide waste heat from the local power station to heat ponds for fish culture on a commercial scale. Again, private interests will be expected to provide business management.

The government, through the Department of the Environment, is supporting the development.

European Community doubles energy research funding

BRUSSELS-Funding for the European Community's (EC) new four-year energy research program, which began in July, has been slashed by \$28 million. Nevertheless, most observers here welcomed passage of the program because total energy research spending is nearly double that of the 1975-79 period.

The new program, worth approximately \$147 million, has five sub-programs. Funds for energy conservation have more than doubled. Production and use of hydrogen is getting only two thirds as much. Solar energy research funds have nearly tripled, geothermal energy gets a slight rise in funding, and systems analysis and strategy studies money is up a third.

Primary importance in solar energy studies continues to be photoelectric energy generation, advanced solar heating technologies and the generation of energy from biomass.

Research on energy conservation concerns households, industry and transport—"the three most important energy-consuming sectors," said an EC spokesman.

Financing for the hydrogen sub-program was cut because, the spokesman said, "only in the long term will hydrogen be competitive as an energy carrier."

Geothermal research will be focused on "locating promising

areas and assessing their geothermal potential."

And "systems analysis and strategy studies" are intended to improve and further develop the models produced during the **GARY YERKEY** first four-year program.

EC puts \$31 million into improving nuclear safety

BRUSSELS—A major research program designed to improve the safe operation of thermal-water nuclear reactors has been approved by the European Community's Council of Ministers, the EC's highest body. The four-year program will provide about \$17.6 million for reactor-safety research, half from the EC budget and the rest from the public and private research organizations.

Sources say the research will focus on three nuclear-safety problems: the loss of coolant and, in the event of an accident, the safe functioning of the emergency core cooling system; the protection of nuclear installations against explosive gas clouds generated by conventional industrial installations; and the release of radioactive fission products into the atmosphere after a reactor

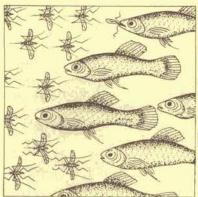
The proposal for such a nuclear-safety research program had been in the works for some time. But its passage by the Council is said to have been speeded by the Three Mile Island accident in Pennsylvania last March.

In a related action, an elaborate research program on the decommissioning of obsolete nuclear power stations was approved by the Council of Ministers.

The \$13.5 million program is intended to develop methods for decommissioning that will "afford the public and the environment the best possible protection," said an EC spokesman. He estimated that about 50 of the nuclear power stations now in operation or under construction in the nine-nation EC will need to be decommissioned by the year 2000 because of obsolescence and about another 100 by the year 2010.

Funds for the five-year research program, which the spokesman said should be regarded "as the initial phase of a longer-term project," will come from the EC and from the private and public organizations that undertake the research.

GARY YERKEY



Larvivorous fish are good for malaria control

GENEVA—The World Health Organization (WHO) last month organized, in collaboration with the governments of Bulgaria and the Soviet Union, a traveling seminar on the use of larva-eating fish for mosquito control in anti-malaria campaigns.

The seminar took place from August 27 to September 15. The initial sessions (August 27—September 1) took place at the Institute of Hygiene and Epidemiology in Varna, Bulgaria. Then from September 9 to 15 field visits were conducted in the Soviet Georgian Republic at the Scientific Research Institute of Medical Parasitology and Tropical Medicine, Tbilisi, and other institutions.

The group, according to WHO, conducted case studies in Bulgaria and the Soviet Union.

Since late 1920's the larvivorous fish, Gambusia—often known simply as "mosquito-fish"—has been used for mosquito control in several countries of the Eastern Mediterranean, WHO said. In view of the extensive use of residual insecticides in malaria control in the last decades, biological control was regarded as a secondary control measure, WHO explained. However, because of the development of insecticide-resistant mosquitoes, larval control by fish is receiving increasing emphasis as an alternative or a supplementary measure.

Gambusia species have voracious appetites, are hardy, reproduce rapidly and are viviparous—giving birth to living young, like guppies.

The purpose of the seminar, a WHO spokesman said, is to discuss and to expose mosquito control and malaria operation officers to the potential, advantages and problems involved in this method of vector control.

WILLIAM G. MAHONEY

Water Quality ...

EXPERTS FROM SEVEN DANUBE states have found that the radioactive pollution of that river caused by nuclear power plants is "very insignificant."

They stated at an international conference in Dobogoko, north of Budapest, that the radioactive pollution was so insignificant that it could be measured only by very expensive methods. Nevertheless, they suggested that strict and permanent control checks be planned to guarantee that Danube water could be used without danger.

THE 67th SESSION of the International Council for Sea Research (ICES) opened in Warsaw recently with more than 400 delegates from 18 European nations and the United States and Canada. The 10-day conference was primarily devoted to means of safeguarding the high seas from ecological catastrophes.

BAVARIAN ROYALTY once wore crowns studded with fresh-water pearls from the Isar and Danube rivers. Today local pearls can be seen only in museums, and the question has been reduced to: can the pearl mussel (Margaritana margritifera) be saved from extinction?

The Bavarian State Environmental Protection Ministry last month awarded \$6900 to the University of Bayreuth's Faculty for Animal Ecology to conduct a study of this problem in the Oberpfalz and Bayerische Wald areas.

The Ministry noted that the disappearance of the river pearl mussel has occurred on a worldwide basis, a victim of pollution in inland waters. It is known that the mussels still exist in some Bayarian areas.

Environmental Minister Alfred Dick declared that "we do not consider it merely a contribution to protecting a species when we try to keep the remaining mussels living...the river pearl mussel is a highly-sensitive indicator for water pollution."

THE HOLY YAMUNA RIVER, snaking through Delhi for 48 kilometers, will be an open sewer within 30 years if the Delhi Administration does not take strict anti-pollution measures immediately.

According to a recent survey made by the Central Board for the Prevention and Control of Water Pollution, the Yamuna is polluted by human waste 25 times more than by industrial effluents. There are 3,329 industrial units, most of them on the banks of 17 open drains which lead to the river Yamuna. And they discharge 23,000 kiloliters of waste water every day.

Lack of funds (estimated expenditure: over \$60 million) has so far stood in the way of an optimistic outlook for a cleaner Delhi water supply.

Legislation...

THE NORWEGIAN GOVERNMENT has proposed to its Parliament a new, comprehensive environmental protection law. It pulls together a number of previous regulations dealing with environment and resources policy.

The new Anti-Pollution Act is concerned with all kinds of pollution from permanent installations and covers water, air and noise pollution, wastes from industry and agriculture, offshore activities, construction work, industrial health, etc.

The Federation of Industries said the proposed anti-noise regulation may cost industry \$2 billion. It demanded a new study of all possible consequences of the proposal.

TO PROTECT THE ENVIRONMENT from pollution, the Greek Ministry of Interior has drafted a bill mandating stiff fines and imprisonment for those who dump dangerous solid wastes.

The bill, to be debated by parliament, calls for fines up to \$30,000 and three to 12 months imprisonment for "everyone who is littering public indoor or outdoor areas with dangerous solid waste." For continuing offenses, penalties will be doubled.

Local government, financed by the state, will be responsible for collection and disposal. The bill foresees a fine of up to \$3,000 for anyone who does so without permission.

The measure particularly affects industries, which will have to give details of the quantity and kinds of waste they handle.

SWEDEN AND THE SOVIET UNION recently signed a new two-year treaty on protecting the environment, and Sweden's Director General of the National Environment Protection Agency, Valfrid Paulsson, said it is vital that the Russians participate in Baltic Sea environmental problems considering the increasing deposits of pollutants.

Under the last agreement the Swedes and Soviets cooperated in making tests of Baltic waters aboard a Russian research vessel.

PHILIPPINE PRESIDENT Ferdinand Marcos has set aside certain areas as wilderness and declared them off limits to commercial exploitation.

Marcos explained that his action is intended to ensure national security, a clean environment, adequate water supply for hydropower and irrigation, and the prevention of floods, droughts and soil erosion.

Marcos also ordered setting up, maintaining and preserving greenbelts where all developmental activities will be strictly controlled.

France will clean and protect its scenic shoreline

PARIS—France has unveiled a code to protect the French coastline from speculators, careless campers and other groups which ignore its environmental value. Environment minister Michel d'Ornano said that the Charter on the Coastline will inspire stricter local codes.

The French action may be too late: the population of coastal communities has trebled since 1964, and more than half of France's 5500 kilometers of ocean coastline have been developed by private interests—with high-rise apartment blocks right on the beach and proliferating boat marinas.

Under the new code, no building will be permitted within 90 meters of the beach and new building codes will be applied to raise architectural standards. Stretches of beach will be preserved free of marinas. New roads and parking must be at least 2 kilometers from the coast. Camping will be permitted only in approved zones at least 90 meters back from the sea.

France already has a law forbidding landowners from blocking passage along the beach below the tidal highwater mark.

AIDA ATTALLAH

Forest fires scourge the beautiful Cote d'Azur

COTE D'AZUR—Forest fires consumed more than 40,400 hectares of pine woods in southern France this summer—despite improved fire-fighting equipment like the Canadair planes which scoop water from the Mediterreanan and dump it, 5 tons at a time, on hard-to-reach blazes in the rugged hills of the region.

Local environmentalists blame the problem on the changing human geography of southern France. Peasants who lived off the forest are being replaced by summer people, and the social change leads to neglect of the forest—and worse. Arson is blamed for at least half the fires.

Owners of wooded property sometimes set fires to evade conservation restrictions and to get their land zoned for building or industrial development. Other motives for arson include vengeance against absentee landlords or even politics—in the case of separatist movements in Corsica.

Once an area has burned twice—as is happening more frequently—it becomes vulnerable to soil erosion. "After two fires, a forest turns to stones," a local forestry official said.

Local mayors want the government to launch a regional rescue plan to replant forests, build cisterns and step up surveillance.

Although France's Mediterranean pine woods have no industrial use, they are a major influence on the landscape and climate. Local people fear that, if the French authorities fail to intervene, the woods will continue to burn in dry summers, gradually destroying the environment of the Cote d'Azur.

JOSEPH FITCHETT

Demonstrations in Colombia over a National Park

BOGOTA—Thousands of Colombians have taken sides in a passionate controversy over industrial progress versus environmental conservation.

In ecological demonstrations, 110,000 people took to the streets August 31 in response to the proposed construction of a city and industrial zone in Salamanca National park on the Caribbean coast. President Julio Cesar Turbay has appointed a high-level commission to study the question.

To be located on the right bank of the Magdalena River near Barranquilla, the coast's largest city, the project was approved in a rider to a bill detailing celebrations in honor of Simon Bolivar, the South American liberator.

Composed primarily of mangrove swamps, the park has suffered considerable deterioration since the construction of a coastal highway linking Barranquilla and Cienaga Grande, an enormous lagoon. At least 70 percent of the mangroves have lost their leaves or been stunted due to the loss of fresh water. The local fishing industry, which provides a livelihood for hundreds of poor families, was severely affected by the environmental changes, particularly the loss of once-fertile oyster beds.

INDERENA, the Colombian wildlife service, has since attempted to restore ecological balance by constructing fresh water drainage, and some of the oyster beds are beginning to recover. However, a request for \$325,000 in government funds to help restore the lagoon to health wasn't approved.

The park still attracts 170 species of birds, a number of animals on Colombia's endangered list—including crocodiles, ocelots and boa constrictors—and plentiful deer, squirrels and foxes.

A number of Barranquilleros have publicly voiced their opposition to the project. But the vast majority of the city's people see it as a source of jobs at a time when unemployment is running as high as 30 percent.

Several large industrial projects are proposed for the satellite city. City fathers also argue that more port facilities are needed on the right bank because the Pumarejo bridge has limited potential growth of the left bank.

Urban planners maintain that the right bank already is polluted and that the addition of industrial plants will not make a noticeable difference.

But INDERENA officials claim the park's destruction can be stopped so long as no industrial zone is created on the western fringes. Barranquilla's Society of Chemical Engineers agrees, adding that prevailing northeast winds will inevitably cause more air pollution in Barranquilla.

Where jobs are concerned, however, the Barranquilleros are not interested in pollution, and some 100,000 joined a parade in support of the planned city, carrying signs, "Go home cachacos," slang for Colombian busybodies from the interior.

PENNY LERNOUX

In Latin America ...

A SOLAR ENERGY HOUSE has been built on the grounds of Mexico's presidential residence as the oil-rich nation pushes its search for alternative energy forms. Dr. Javier Ibarra, solar energy official with Secretariat of Human Settlements and Public Works, supervised construction of the single-family house which includes a television set powered by photo-electric cells and solar water-heating panels.

THE MOST MODERN FRUIT-FLY control center in the world (so its sponsors claim) opened in Mexico near the Guatemalan border. Built with the assistance of the U.S., Canada, the UN's Food and Agricultural Organization and the International Atomic Energy Agency, the center utilizes nuclear energy to sterilize male fruit flies which are then released. Some 500 million sterile fruit flies per week can be produced.

MEXICO IS INVESTIGATING the possibility of building its next nuclear energy electrical plant to use natural, rather than enriched uranium. Mexico's first nuclear plant, the Laguna Verde, Veracruz plant, due for completion next year uses enriched uranium.

VENEZUELA'S LARGEST BREWERIES will produce 400 million recyclable beer cans a year, of a type similar to those in use in the United States, said Alcasa General Sales Manager Rafael Rodriguez Pulido. Alcasa produces aluminum.

Presently local beer cans are made of tin and aluminum and are not recyclable. They are the single worst factor in pollution in public beaches and parks in Venezuela.

Production of aluminum containers is to begin in January 1980.

Pulido said aluminum has a recycling value 10 times that of tin and that the new aluminum cans will be bought back by Alcasa.

Beer consumption in Veezuela is 960 million liters a year.

DANGEROUS LEVELS OF MERCURY pollution at the Moron Petrochemical Plant on Venezuela's west central coast were denounced in a press report by the Environmental Committee on Industrial Pollution. The Health Ministry did not confirm, however, the report of 16 deaths among plant workers in the last two months.

The committee said that 200 workers show signs of mercury poisoning: tremors, loosening teeth and fainting spells. The patients are being treated.

The petrochemical plant, now 22 years old, used merury as a cathode in electrolysis for many years. Of an estimated 40 tons of mercury used, 3 tons have reached the sea.

Effects of mercury contamination are showing up in towns 40 kilometers away.

Meetings ...

IN CHINA, a recent meeting on pollution control called for increased attention to coastal waters. The coastal regions bordering the Bohai Bay and the Yellow Sea are among China's leading industrial areas and there are three major oilfields, a dozen harbors and 10 cities including Tianjin, Qindao and Luda, which together have had several hundred factories. In the wake of the expanding industry, the water along more than 2000 kilometers of coastline has been polluted.

Since 1974, more than 300 scientists and technicians have worked on the problem of pollution of the areas and have identified the major sources of pollution.

The State Council in 1977 set up a group for environmental protection of the bay and the Yellow Sea and mapped out a plan for pollution control.

Around \$387,097 has been appropriated for the task in the last two years, in addition to funds allotted by local provinces, cities and enterprises.

A UNESCO CONFERENCE opened in Leningrad September 4 to bring together experts from all over the world to discuss ways of increasing international cooperation and exchange of information in biological studies.

According to Tass, this month the USSR Academy of Sciences organized 13 international meetings of scientists on different themes that stressed greater cooperation in this field.

The themes included environmental protection, the oceans' wealth, ocean and the atmosphere, and space cooperation.

OVER 100 REPRESENTATIVES from governments, international agencies, scientific bodies and other organizations met in Moscow from October 1 to 6 for the second Network Management meeting of Infoterra, the international environmental information network of the United Nations Environment Program (UNEP).

Since Infoterra was set up four years ago, 100 countries—representing 95 percent of the world's population—have joined it. It now provides access to information on around 1,000 environmental topics. Infoterra has been operational since 1977, and so far has helped at least 3,000 individuals and organizations to locate scientific and technical information on a wide variety of environment-related subjects.

During the Moscow meeting, participants discussed ways of expanding the system further, evaluated its basic concepts and procedures, and began preparations for an in-depth review planned for 1981.

U.S. and Mexico say they'll work on eco-damage agreement

MEXICO CITY—Mexico is ready to enter into agreements with the U.S. over future environmental contamination along the two nations' common border and within common seas, but such agreements will have nothing to do with past events, such as Mexico's Ixtoc-1 runaway offshore oil well, Mexican President Jose Lopez Portillo announced on his return from two days of Washington talks with President Carter.

"Agreement, yes. Agreements to take care of what is important to everyone, yes. The will to resolve peacefully, by means of the law, future controversies, yes. For the future, everything. For the past, nothing. These were the terms we established with President Carter," he said in a public address.

When the subject was brought up of Mexican payment for oil damages to Texas beaches, Mexico's reply was the following, he said: "We do not recognize as law a rationale that isn't general...Democracy consists in the following: Either everyone acts together or everyone is wretched."

Lopez Portillo explained that the U.S. did not accept Mexican claims for payment for damages to the Mexicali Valley caused by salinity of the Colorado River. After U.S. farmers used the river, its residue of extremely salty water flowed into Mexico, ruining thousands of acres of prime crop lands.

"If our rights in the salinity of the Mexicali Valley are not recognized, with what authority are we now asked to recognize rights in the Gulf of Mexico?" he asked.

"We are ready to begin agreements to fix terms to which we are all duty-bound to comply, to not continue contaminating our environment, our common frontier and the seas which unite and separate us.

"We are ready to establish general principles, but for governing future situations, nothing for the past," Lopez Portillo said.

Ixtoc-1, off the Yucatan Peninsula state of Campeche, continues to run wild months after its June 3 explosion. Technicians have cut the flow to 10,000 barrels of oil daily and hope to install a massive inverted funnel over the well-head. The funnel, or "sombrero," is 50 feet tall, weighs 305 tons and would divert escaping oil into storage tanks. Rough seas and damage to a part of the "sombrero" delayed its placement.

Meanwhile, the director of the nationalized oil industry underwent an unusual official public interrogation on the runaway oil well and the nation's petroleum policies in general.

For eight hours, Jorge Diaz Serrano, director general of Petroleos Mexicanos (Pemex), answered questions asked by 35 federal legislators representing the seven legal political parties. Not in the last 50 years has a high Mexican government official made such a public accounting. The session had been unanimously and formally requested by the Chamber of Deputies and approved by President Jose Lopez Portillo, who appointed Diaz Serrano three years ago.

The Pemex chief repeated his earlier statements that the June 3 explosion of Ixtoc-1 was an accident and not caused by human or equipment failure or error. The consequences of possible damage have not yet been confirmed, he said.

Thus far, Ixtoc-1 has cost Pemex \$43 million. More than two million barrels of oil have gushed from the well, but most of that has been recovered or has evaporated or been burned off, he claimed.

Ecological damage was barely mentioned; most of the session was devoted to defining Mexico's oil policy and to describing his own business investments and professional qualifications.

However, the Mexican Petroleum Institute's 112-page report, "Environmental impact and preliminary conclusions," dealt specifically with Ixtoc-1. Conclusions were based on 118 water samples, 16 examples of seabed sediment and 245 marine species—all taken from the vicinity of the well.

Concentrations of hydrocarbons in the area of the well are "not lethal for marine life," it said, noting that the "ecological tolerance of the seas... is ample." Environmental impact of the oil spill can be known with precision in a year, the report stated. Studies will continue through that time.

KATHERINE HATCH



90 irate Mexican specialists quit clean air section

MEXICO CITY—This year, some 90 specialists in Mexico's clean atmosphere section have quit the Subsecretariat of Environmental Improvement, and the monitoring system in the Valley of Mexico has been abandoned.

This disclosure was made in a series of articles in the daily paper Uno Mas Uno, published here. The writer, Miguel Angel Velazquez, found that most who quit had at least five years of experience, knew the monitoring systems and understood the gravity of the situation.

Mauricio Rico Martinez, a monitoring specialist with 12 years experience, blamed "internal politics," "corruption" and lack of support in his August 31 letter of resignation.

The subdirector of the monitoring systems' department of evaluation and analysis, Rogelio Garcia, said in his September 13 resignation letter that he had "never officially (been) told the duties and functions to which (he) was assigned."

Official government response was not available by WER publication time.

KATHERINE HATCH

Energy Sources...

IN NEW SOUTH WALES some 37 households of the town of White Cliffs are plugging their telephones into—the sun.

They join 48 other telephone subscribers whose phones depend on the sun for their power.

Telecom Australia, the federal telecommunications authority, reports that the system is no different from conventionally powered phones and can carry 24 calls simultaneously. That's five times more than the wind-powered system.

THE OLD STORY of the kite, the key and the birth of electricity takes on new significance for three Australian scientists who envisage giant gliders as the means to a new energy source.

They are testing a prototype in a wind tunnel at Sydney University and are building a model that will have a 4-meter wing span. The real thing will be the size of a jumbo jet.

Drs. Clive Fletcher, Doug Auld and Associate Professor Bryan Roberts have the backing of the National Energy Research, Development and Demonstration Council. Their aim is to tap power generated by the winds of the jet stream, 12,500 meters above ground. Turbines fitted onto the jumbo gliders would convert windpower to electricity.

The first commercial kite would cost \$10 million and the electricity at a ground level would cost 3 cents per kilowatt-hour to produce.

The gliders would someday also possibly be used as booster stations for telecommunications, thereby rendering satellites obsolete and expensive.

A SACRED FRUIT of the Hindus may be one answer to India's oil shortage.

The fruit of Gauzuma tomentosa is traditionally worn around the neck to ward off evil spirits. Now it will be used to produce a spirit. Indian scentists have found that the fruits are an excellent source of an alternative fuel—alcohol.

After the fruit is fermented for three days, distillation yields a clear fluid of three percent ethyl alcohol.

Suryakirana Salakaranagalu, a scientific laboratory in Bangalore has proposed rapid development of an alcohol industry based on the use of the fruit

Gauzuma tomentosa grows in abundance in most of the country. It is called Rudraksha in the south and Nepal tunth in Bengal.

In Asia...

GOVERNMENT PROJECTS to curb environmental pollution next year in South Korea have to be revised or cancelled due to the drastic budget cuts.

The Ministry of Health and Social Affairs was allotted only 13 percent of the funds it needs, or \$13 million, for setting up the Office of Environment and carrying out other anti-pollution

projects.

Projects curtailed include providing funds to help factory owners equip anti-pollution facilities, the setting up of sewage disposal facilities and the establishment of waste collection centers.

THE PHILIPPINE GOVERNMENT has set up a number of incentives for controlling industrial pollution. These include a 50 percent tariff exemption on imported anti-pollution devices. Responses from businessmen are mixed as some consider anti-pollution devices a social investment which should be subject to a full tariff exemption of 100 percent.

CHINA RECENTLY ADOPTED its first environmental protection law.

It stipulates that polluting enterprises may not be built near residential or protected areas. Those existing should take measures to control their pollution or they will be removed to other sites. No rubbish or slag should be discarded in rivers, lakes and seas, and industrial waste in working areas will be reduced to standards fixed by the state.

Cleaner energy sources such as coal gas, solar energy and new technologies which utilize industrial wastes are to be developed.

The law also provides for the protection of forests, grasslands and certain wild animals and plants.

The state will penalize those who pollute and harm the environment.

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Population a complex issue, legislators agree

COLOMBO—In an effort to bring legislation into high level consultations on the world's growing population problems, the United Nations Fund for Population Activities (UNFPA) and the Inter-Parliamentary Union (IPU) brought together 400 legislators from 64 countries for a 5-day meeting here on "Population and Development."

The absence of the People's Republic of China, the world's most populous nation, was a disappointment to officials—though.

invited, China did not send a delegation.

The declaration adopted by the meeting stated that no population program should be considered in isolation from health, housing, education, employment, the environment and the use of resources.

Demands on energy and biological resources—croplands, fisheries, forests, grasslands—are rising steadily and have already begun to outstrip the capacity of many local biological systems as

currently managed.

One of the most important decisions of the conference was its call for religious leaders to review their attitudes regarding. population and family planning, "taking into account the tremendous impact of population pressures on human spiritual and physical well-being."

Delegates agreed that an annual target of one billion dollars in international population assistance should be achieved by 1984. The Conference plans a UN World Population Conference in 1984 which the Philippines government has agreed to host.

MANIK DE SILVA

New Zealand may put a million hectares into crops for fuel

WELLINGTON—New Zealand may use one million hectares of its farmlands for the production of ethanol and methanol.

Dr. Colin Maiden, author of a report published by the national energy research and development committee, suggests that one million of the 21 million hectares now being farmed throughout the country be turned over to raise fodder beet and timber. The beets would produce ethanol and radiata pines methanol for mixing with petrol to produce gasohol. This should be all the production needed for this lightly populated (3.5 million people) country's transport fuel requirements. JANE NACZYNSKI-PHILLIPS

OCTOBER 8, 1979

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Development assistance and environment policies

PARIS—On September 12 and 13, representatives of institutions that control several billions of the world's development dollars met in Paris to debate and finally approve a draft environmental declaration. In it they reaffirmed their support for the principles of the 1972 Stockholm Conference on the Environment and then pledged to go several steps further.

They stated they would, to the best of their abilities, negotiate with all concerned to ensure the integration of appropriate environmental measures in development activities, provide technical assistance and training to developing countries, actively consider projects designed to enhance the environment, initiate and cooperate in studies for improved appraisal methodologies, and share information with each other and recipient countries and agencies.

Institutions represented were: the World Bank, African Development Bank, Asian Development Bank, Arab Bank for Economic Development in Africa, Caribbean Development Bank, Comission of European Communities, Inter-American Development Bank, Organization of American States, United Nations Development Program, and United Nations Environment Program.

Peter S. Thacher, Deputy Executive Director of the United Nation's Environment Program, said he hoped that the meeting would "start a dialogue which will help to ensure that the development financed by institutions such as yours will be enduring."

To set the stage, Dr. James A. Lee of the World Bank summed up the "decade of environment" and added he has seen increasing sensitivity and awareness for "a wide range of environmental problems not even envisioned five years ago." But he noted, negative economic signs may result in a period of reassessment about the allocation of scarce resources. Nevertheless, he concluded, "the time is at hand" for the development assistance agencies to harmonize environmental policies and procedures because the borrower "expects and welcomes" environmental guidelines.

The second day of the conference was primarily devoted to hammering out the language of the draft declaration prepared by UNEP. Alemayehou Seifou, Senior Legal Officer for the African Development Bank, suggested several amendments to the first draft. The fourth draft was finally accepted—subject to suggestions from the delegates' head offices.

Finally, the delegates planned that the meeting to sign the Declaration of Environmental Policies and Procedures Relating to Economic Development should be held in New York before the General Assembly meeting in March or April.

LIBBY BASSETT

In Europe...

THE UNITED NATIONS Economic Commission for Europe (ECE) will hold a January symposium in Geneva to discuss various problems in the use of steel for construction, including environmental impact.

An ECE spokesman said that the purpose of the symposium will be to optimize the use of steel and, in particular, new iron and steel products in various building construction sectors.

About 40 papers have been proposed by experts from Austria, Belgium, Czechoslovakia, France, West Germany, Hungary, Italy, Luxembourg, The Netherlands, Poland, Soviet Union and Britain.

THE BAVARIAN MINISTRY for the Protection of the Environment has issued a warning that if the number of mushroom pickers continues to grow, controls may have to be imposed.

The warning pointed out that Switzerland, the state of Baden-Wuertemberg and the South Tirol had been forced to ban mushroom picking, and that if cropping excesses continued, Bavaria might be forced to do the same.

The Ministry expressed particular concern over a new development: commercialization of mushroom picking. It noted that tourist agencies had begun to organize bus tours, driving hundreds to known mushroom areas and turning them loose upon the forests. This, the warning said, not only threatened to deplete mushrooms, but also damaged the woodland, disturbed the ground and the wildlife.

THE GREEK MINISTRY of Agriculture will establish 30 greenhouses in various parts of the country powered by solar energy.

Deputy Minister of Agriculture Stavos Tataridis said that "the establishment of the greenhouses is part of a plan for the experimental use of solar energy in agriculture." He placed it within the framework of a general program adopted by the government to save energy.

He added that each greenhouse will cover an area of a quarter of an acre, and will be used for the cultivation of green vegetables.

Mr. Tataridis said that smaller scale experiments made last year produced very encouraging results.

WHO program for chemical control makes progress

GENEVA—The World Health Organization (WHO) has announced a great deal of progress in establishing an international program to increase chemical safety.

Risks from toxic and hazardous chemicals are greatest in the industrialized countries, but even developing countries see increasing chemical hazards to air and water quality, food chains, and human health. In particular, food safety problems relating to chemicals are increasing in all countries.

This report in the most recent issue of WHO Chronicle stated that in the last decade or so about 200 and possibly as many as 1000 chemicals have been put on the market every year—as food additives pesticides or agricultural, industrial, and household products. At that rate the new WHO international program on chemical safety became a necessity.

The cost of the program has been estimated at \$2.5 million initially, rising to \$6.5 million per annum when fully operational. It noted that most of the resources for the program will have to come from individual donor countries and other "extrabudgetary" sources.

The program will have a worldwide network of national institutions to evaluate risks from cleaning agents, cosmetics and food additives as well as industrial chemicals, plastics and packaging material.

Preliminary consultations with several European countries, Canada, Japan and the U.S. have taken place, and talks with other countries will soon follow.

Much of the machinery for the program is already in place and functioning. A 15-member advisory committee has been appointed by WHO to advise on policy and priorities; a central unit, at WHO headquarters in Geneva, has been set up to plan and coordinate the international action; and a technical committee has been established to advise on the technical aspects in the management and operation of the program.

WILLIAM G. MAHONEY

Thallium endangers health of cement plants' neighbors

MUNICH—Emissions of poisonous dust clouds containing thallium from cement plants in the area of Lengerich during the last week of August have triggered sharp crackdowns in that area and investigations elsewhere.

Bans have been slapped on the sale of all grain, fruit, vegetables, fodder and other foodstuffs produced in the Lengerich area located in North-Rhine-Westphalia. Cattle in the area must be tested before slaughtering to ensure they carry no thallium traces.

The state agricultural ministry, in announcing the bans on August 28, added that farmers will receive adequate compensation for their losses.

Meanwhile, health authorities have announced that analyses of hair and urine taken from 45 patients in the area have shown traces of thallium in six cases. Authorities, concerned that the thallium traces might cause injuries to unborn children, have suggested that mothers-to-be undergo physical exams.

Because the poisonous emission was caused by deliveries of a ferrous-oxide mixture used in cement production from a firm in Duisburg, authorities have been conducting a wider investi-

gation.

Meanwhile residents in the area of Lengerich have banded together and employed a lawyer to represent them in an action against the cement plants. So far, four plants are believed to have been the source of the poisonous emissions.

WILLIAM G. MAHONEY

International Law is at issue in Netherlands damage suit



BRUSSELS—A salt treaty on the minds of Dutch citizens in the coming months will concern not weaponry but sodium chloride, the stuff we eat. It is carried into The Netherlands at record levels by the Rhine River. And some observers say damage to life and property could reach critical proportions.

Salt is only one of 1500 pollutants carried by the sewer-like Rhine from cities and industries along a 1312-kilometer journey through five countries. As a pollutant, it has never received the attention it deserves. Two recent reports could change that.

First, figures released this month show that the Rhine has been dumping salt on The Netherlands at a rate of 21 million kilograms per day, more than 17 million tons per year. About a third of it comes from the French government-owned potassium mines in Alsace

Second, the World Health Organization has just reported finding "strong evidence of a relationship between sodium and hypertension." Serious health effects of sodium are just being realized. Sodium was not even listed in the 1971 WHO International Standards.

The Rhine River provides 15 percent of the drinking water for The Netherlands and 70 percent of the country's total water requirement.

Annual salt damage to Dutch agriculture has been put at \$35 million. So, it is not surprising that it has been the nursery farmers—who feel the direct effects in their pocketbooks—who have spearheaded a salt treaty movement.

Fed up with government efforts to effect an international river clean up—negotiations have been taking place among the five

Environmental Legislation...

NIGER AND UPPER VOLTA have ratified the constitution for an African Solar Energy Center. When another five African states take the same action, the UN Economic Commission for Africa will be empowered to develop the center, whose site has not yet been chosen.

African ministers meeting in Rabat, Morocco, last March agreed to establish a center to encourage the use of solar energy for development in Africa. It will help African states with research and development, promote energy studies in African schools and universities, and encourage the wider use of solar energy.

SOUTH KOREA RECENTLY REDUCED the maximum driving speed on four-lane expressways by 10 kilometers an hour to conserve fuel consumption as well as to prevent traffic mishaps.

THE PHILIPPINE CAPITAL, Manila, now has an Urban Land Reform Zone and its use and development will be tightly regulated.

President Ferdinand Marcos, using his martial law powers, has decreed that from now on no land can be sold or transferred, and no houses can be built without the approval of the government's Human Settlements Commission.

Mr. Marcos said that because of a land ownership monopoly and the absence of a regulatory body, land speculation had caused "irrational patterns of land development resulting in the emergence of blighted areas, slums and squatter colonies."

Unrestricted pricing put land ownership beyond the reach of the average wage earner.

However, he emphasized it was not the government's intention to expropriate land if its development was in accordance with the government's long-term plans.

Full details of the Urban Land Reform Zone are not available, but it is understood Manila's entire 635 square kilometers will be zoned and incorporated under a master development plan.

IN HONG KONG, four environmental protection bills may soon become law. These will cover waste disposal, water pollution, air pollution and noise abatement.

The objective is to prevent environmental deterioration and to avoid imposing blanket controls which could have a dentrimental effect on the economy.

The detailed draft laws are now making their way through the Environmental Protection Advisory Committee (EPCOM) vetting session.

Water Quality . . .

POLLUTED WATER apparently was the cause of a major hepatitis epidemic which hit Czechoslovakia this summer.

No over-all official figures of the number of cases were published though various local papers spoke of hundreds of patients, and a local North Bohemian regional daily said 0.5 percent of people in the worst hit centers were involved.

The official Rude Pravo daily indicated the epidemic was caused by the use in dairy production of polluted water which had seeped from sewers into drinking water. No official information when and where this happened was published.

Once the illness and cause was identified, the authorities moved fast, removing from shops all incriminated products—chocolate, biscuits and long-lasting milk. All leaves for medical staff, from doctors down to ambulance drivers, were cancelled and plans for emergency hospitals made. Childrens' holiday camps were either cancelled or limited territorially so that children from infected areas could not mix with children from areas in which no cases were reported. Tourists from Poland and East Germany were warned to avoid travel to Czechoslovakia whenever possible.

THE SONGHUA RIVER SYSTEM in Northeastern China is being polluted by six million tons of industrial wastes daily, according to New China News Agency.

A total of 43 factories and enterprises pouring wastes into the river were told to control polluting the river by the end of 1981 or face closure.

COUNTRIES OF THE PACIFIC region have become increasingly aware of their own environmental problems and challenges, said Sveneld Evteev of the United Nations Environment Program (UNEP) after attending the 14th Pacific Science Congress in Khabarovsk, USSR. Scientists from all over the Pacific and from other countries attended the meeting, whose theme was "Natural Resources of the Pacific Ocean for the Benefit of Humanity."

Evteev, UNEP's Assistant Executive Director, warned that the Pacific area contains many small island countries whose ecosystems are highly vulnerable. In these areas planners must ensure that man-made disasters do not follow development programs.

It is vitally important for these countries to retain the undegraded environment which is probably their most important natural resource. He expressed concern that only three countries —Western Samoa, Papua-New Guinea and France—had so far signed the Convention on Nature Conservation in South Pacific, which was drawn up in Western Samoa in 1976.

Rhine nations for 45 years—a group of private citizens, notably the owners of three large nurseries, formed a foundation in 1974 and sued the Mulhouse-based Mines de Potasse d'Alsace for damages. But, nowhere is it written that fouling the Rhine is illegal.

The Rotterdam court, however, last January announced an interim decision that established the right to damages and declared polluting an international waterway with consequent downstream damage to be illegal. Last month, the Dutch government awarded the Foundation, which had been waging its battle with private money, a substantial grant and a promise of continuing support.

Says D. M. J. Lasonder, a lawyer and the Foundation's secretary, "We hope for a decision in our favor by the end of this year; we expect one at the latest early next year."

A favorable ruling would open the way for other individuals seeking compensation. "A formal and final declaration of illegality is the first step that will open the floodgates," Mr. Lasonder says. "It's a battle we'll have to fight ourselves, privately in the courts. Politicans have proven that they will never solve the problem."

The facts suggest that Mr. Lasonder's prediction may be correct. After nearly a half-century of government attempts to negotiate an end to Rhine pollution, the Rhine basin remains, in Mr. Lasonder's words, "a juridical vacuum."

Besides its own Rhine clean-up program—worth about \$1 billion through 1985—the Dutch government has paid France \$10.5 million outright to do something other than dump its salt wastes into the Rhine. Nothing has been done with money.

With 1500 supporters, including some corporations, the Foundation means business.

Asked to specify the Foundation's financial resources and the amount of the government grant, he answers, I can say that we easily have enough money to see this thing through to the end, no matter how long it takes."

GARY YERKEY

Colombia's tough sea code protects its coasts

BOGOTA—The Colombian government has announced a comprehensive code for the protection of the country's Pacific and Atlantic coasts.

Composed of four decrees, the code establishes a coast guard to patrol the seas and sets fines of up to \$2 million for any ship or factory that contaminates coastal waters or rivers emptying into the sea. Particularly stiff fines will be levied against dumping of mercury and cadmium, dangerous chemicals and any solid, liquid or gas substance for chemical or biological warfare.

The regulations complement an existing environment code covering land resources, but unlike the latter the sea code contains high fines and explicit instructions for the transport of such potential pollutants as petroleum. As of January, 1982, no vessel will be allowed to dock in Colombian ports unless it is adequately equipped to prevent oil seepage from the ship's pumps. All tankers will be required to carry logs detailing oil cargo or other pollutants.

An insurance system also will go into effect in 1982 under which vessels and factories will be required to carry pollution policies starting at \$250,000 to pay for fines and environmental damage. A licensed corps of inspectors will be employed under the authority of the port captains to monitor loading and unloading of ships.

This code is the toughest yet produced in Latin America and reflects the government's growing alarm over contamination of Colombia's seaways.

PENNY LERNOUX

Concern is growing in Peru over use of banned chemicals

LIMA—The apparent lack of control in the use of potentially dangerous insecticides in Peru is causing concern.

Farmers in remote areas of the country, where Peru's "strict" laws are not enforced, are using insecticides without the assistance of specialized technicians. Companies which market insecticides throughout Peru rely on their distributors to explain how the insecticides are to be used. "Instructions are written on the package," says a spokesman for Shell in Lima. The literacy rate was 72 percent in 1974.

Professor Kenneth Mellanby, a leading environmental authority, pointed out in a recent article entitled "Double Standards" published in the prestigious magazine Nature that the pesticide, aldrin, manufactured in Peru by Shell, is advertised on a "huge, ugly hoarding" on the shores of Lake Titicaca. The use of aldrin is allowed only in exceptional cases in Great Britain, and it is totally banned in the United States. In Peru, it is used to treat 50,000 hectares in the sierra (mountains) and 30,000 hectares of coast land.

The list of insecticides used here which are banned or strictly controlled in developed countries is sizeable. The Ministry of Health, for instance, imports DDT, Bayer produces BHC, Farmagr produces Heptachlor and Pastor Boggiano produces Texapheno. And there are others.

Flirting with ecological danger is a well-known phenomenon in developing countries where medical and dietary demands appear to justify the risk. In Peru's case, chemical manufacturers, farmers and officials consider the pesticides an "excellent arm against agricultural plagues because of the insecticides' prolonged effect and relatively cheap cost."

The cost on small- and medium-sized farms works out at less than \$2 per hectare: The ruling that a permit is required from the Ministry of Agriculture is generally waived and abuses can happen.

Large-scale applications are better controlled. After an ecological disaster in the 1950s when large tracts of cotton were sprayed with insecticides that destroyed all bird life in the area, regulations were introduced and are still being enforced. Aerial spraying companies have to obtain a Ministry of Agriculture permit and the "recommendation" of a qualified technician.

LORETTA McLAUGHLAN

Recycling ...

THE SOUTH KOREAN government has decided to establish a corporation to exclusively handle the reclamation of wastes.

The new agency will be set up by the end of the year under the planned Office of Environment. Details of management and budget are being deliberated by the Ministry of Home Affairs. The Ministry of Health and Social Affairs is also working on the revision of related laws.

The government has allotted \$1,935,242 to establish the agency, and it will invest some \$20 million in the project, including the setting up of collection centers to gather wastes in 11 provinces. The facilities are designed to prevent environmental pollution in addition to the reclamation of wastes.

A PHILIPPINE PILOT PROJECT will be set up to recycle agricultural wastes. The venture will be financed by international groups.

In this project, the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) is planning to recycle wastes from coconut, sugar, rice, maize, cassava, palm oil and rubber production.

A four-man ESCAP team recently undertook an environmental and economic survey of recycling potential wastes of these key agriculture commodities.

A SYDNEY SUBURB is the first in Australia to have a drive-in recycling plant. Randwick City Council decided to build a \$190,000 depot rather than spend \$16 per ton to bury or burn its garbage. The plant will save the council at least \$30,000 per year as it retrieves 30 tons of paper and cardboard, five tons of glass, and five tons of metal cans each week. The recycled rubbish is sold back to manufacturers.

VENEZUELAN ENVIRONMENT MINISTER Carlos Febres Poveda announced a new sanitary fill system for Caracas garbage—"the best in latin America." Caraquenos produce 1.5 kilograms of trash daily.

The two city garbage dumps, until last year the object of protests over the odors of underground burning, have been redesigned to receive 4000 tons a day each. Now, as the garbage is delivered in trucks, recycleable materials are recovered, then tractors scatter the remainder on terraces and cover each meter-thick layer of garbage with 30 centimeters of earth.

In Latin America ...

EASTERN CARIBBEAN EFFORTS to develop alternatives to costly fossil fuels to get a \$2.3 million loan from the United States.

The U.S. Agency for International Development (USAID) is now "programming the loan," according to a Washington-based American specialist in Latin American and international economics.

Dr. Richard Feinberg made the remarks in a lecture this week in Barbados. Dr. Feinberg said that countries with "good human rights records" would find it easier to get American aid than governments who "abrogate the social contracts whereby they govern."

THE SHRIMP POPULATIONS of Venezuela's north-eastern coast and the Orinoco Delta are threatened by illegal trawling practices, according to icthyologist Oswald Silva of the Central University of Venezuela.

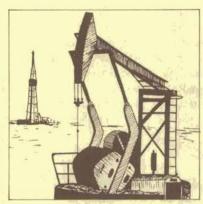
Trawlers from Venezuela itself, Trinidad, the Dominican Republic, Guyana, Martinique, Japan and even China, enter the prohibited waters of the delta and the coastal 10-kilometer zone where the shrimp breed. Coast guard inspections reveal that nets used by the trawlers are so fine that "the smallest creature cannot escape," reports Silva, who fears that like the Gulf of Venezuela, once rich in shrimp, the delta will soon be over-exploited. Silva was for eight years director of the Fishing Research Center of the Agriculture Ministry, the agency responsible for regulating fishing practices.

GERMAN MINISTER OF ECONOMICS Ofto Graf Lambsdorff recently visited Mexico and South America. In Venezuela and Mexico, although no agreements were signed, Lambsdorff made clear Germany's interest in exchanging nuclear technology for oil. Nuclear discussions in Argentina and Brazil centered on furnishing a heavy water plant for the nuclear center of Atucha II now under construction.

Venezuela and Germany have an agreement for the joint exploitation of the Orinoco Tar Belt in the hope of turning the heavy crude to economic benefit. Nearly half of Germany's foreign investments are concentrated in Latin America.

BUENOS AIRES organized Argentina's First Intermunicipal Congress on Botany which took place September 3-7. The goal was to promote creation, protection and conservation of green spaces in and around the country's urban areas.

Discussions covered such topics as: green space projects in urban areas, conservation of green spaces, and current legislation as regards green spaces.



Ixtoc One is one of many problem oil wells in the world

MEXICO—In his third annual State of the Union address, Mexican president, Jose Lopez Portillo, devoted considerable time to Ixtoc-1, the runaway offshore oil well, and to oil spills worldwide.

"There are greater possibilities of near-term and low cost production of oil at off-shore sites than on land, since we have large deposits that are situated . . . where drilling operations will not interfere with anyone's activities," a reference to the disturbances caused by land drilling.

Three new electrical energy-producing plants will utilize alternate forms of energy, the president said. The Chicoasen plants on the Grijavla River will use hydroenergy; the plant at Rio Escondido will burn coal and the Laguna Verde facility will operate on nuclear energy.

Three times during his three-hour speech, the Mexican president referred to Ixtoc-1, the world's worst oil well spill still throwing 10,000 barrels of crude oil daily into the Gulf of Mexico off the Yucatan Peninsula.

"Through exploration in the Gulf of Campeche we discovered a vast deposit of oil and gas of exceptional pressure and composition. This was good news. What was anything but good news," he continued, "was the accident in one of the 150 wells drilled there: Ixtoc One."

Criticizing international news media, the president said that information "channeled back to us is managed by others."

As an example, he said, "On Oct. 18, 1978—eight months before Ixtoc One—'Cameron 81,' a U.S. well being drilled in the Gulf of Mexico, blew out. That eruption still continues and it has reached as high as 80 million cubic feet of gas per day, which is burned.

"Every year the world over, an average of 60 oil wells blow out, of which some 15 are at sea. At this moment, there are 10 wells out of control on land—seven in the U.S., one in Canada, one in China and one in Iran; there are three offshore blowouts—one in U.S. waters, one in Singapore, one off Iran." KATHERINE HATCH

Mercury pollutes Venezuela's western shore

CARACAS—Although mercury spills found at the Moron Petrochemical Plant were stopped a few months ago, the mercury continues to contaminate the coasts of Puerto Cabello and other Falcon State beaches. Dr. Rivero Plaz, head of the occupational diseases division of the Venezuelan Social Security Institute, and a group of scientists made a study of the contamination along the Falcon Coast and the Golfo Triste on the western shore and warned the government against the danger of uncontrolled pollution.

In Moron, he said several workers are under treatment for mercury contamination. "None of the cases is serious," he said, but the treatment involves a long process of gradual elimination of mercury from the patient's body. Mercury usually attacks the nervous system, causing a variety of symptoms, from depression and chronic pain to severe crippling.

Dr. Plaz further warned that a sewer stream, Cano Alpargaton, receives toxic discharges of the Moron plant and carries them directly to the Golfo Triste, without any prior treatment. He asked the Environment Ministry to clean up the North Coast beaches near Moron as soon as possible. He warned that pollution levels are relatively low now but could increase dangerously if the discharges into the Cano Alpargaton are not stopped.

H. BRANCH L. DE STEINHEIL

Lima's sewage comes clean by fertilizing barren sand

LIMA—An experiment carried out by the ministries of health, agriculture, housing and the Lima town council to recycle waste water in the southern area of Lima has shown that Lima's polluted coast and beaches could be cleaned up in the near future. As an added bonus, food crops can be cultivated in the barren desert surrounding the city, says Dr. Rey Riveros, president of the Association for Defense of the Environment.

The experiment rerouted sewage normally dumped into the sea at Chorrillos, a southern suburb of Lima, to wasteland in San Juan de Miraflores, a nearby shanty-town, where it was collected in natural "wells" in the sand. The waste was then channelled into a series of other wells, gradually through filtration, becoming clean water.

"This water can be re-used," sayd Dr. Riveros. "And we found that the sewage was an excellent fertilizer—even in sand. Crops can be grown there cheaply."

The government, however, has no plans for further action. "Pollution control is not a government priority," he said. "We need environment legislation and a ministry for the environment here. The environment association wants to get this project off the ground to prevent sea and city pollution. We'd like to form a private company to do it if the government won't."

There are eight sewage outlets into the sea and all could be diverted to make similar irrigation projects, says Dr. Riveros. Costs, however, have not been calculated.

"This scheme could be applied nationwide. Something similar is being done in the south, in Arequipa. The process has already been successful in Venezuela and Cuba, for sugar cane irrigation, and in the United States," he says.

LORETTA McLAUGHLAN

Meetings ...

NOVEMBER 1, representatives from business, government, financial, and environmental communities are invited to meet in Washington, D.C. for a conference on the Executive Order of January 5, one of the most controversial international policies of U.S. President Carter's administration.

This order—rquiring environmental reviews of U.S. government actions that have an effect outside the U.S.—will have important implications for many U.S. companies. Many specialists believe the Federal action could lead to a new system of international environmental assessment. Although the Order is six months old, regulations for implementation were just filled last month.

The one-day conference will include representatives from the U.S. Department of State, U.S. President's Council on Environmental Quality, the Export-Import Bank of the U.S., the Mexican government, U.S. Industry, the Office of International activities of the U.S. Environmental Protection Agency, and the Natural Resources Defense Council.

The conference is sponsored by the Center for International Environment Information. Contact Ann Claxton (212) 697-3232.

NOVEMBER 2-3, International Conference, "Exportation of Hazardous Industries, Technologies, and Products to Developing Countries," in New York, sponsored by the University of Connecticut Health Center, National Institutes of Occupational Safety and Health, the U.S. Environmental Protection Agency, and American Public Health Association. Speakers represent NIOSH, EPA, the International Labor Organization, United Nations Environment Program and the Oil, Chemical and Atomic Workers Union. Contact Ms. Jane Ives (617) 492-7100.

NOVEMBER 5-6, International Symposium on Health Effects of Synthetic Silica Particulates, in Torremolinos, Spain, sponsored by the American Society for Testing and Materials with the cooperation of the Industrial Health Foundation. Contact Donald Tobias, ASTM, (215) 299-5546 or Donald D. Dunnom, PPG Industries, Inc. (412) 434-2414.

APRIL 21-24, 1980, Bio-Energy '80, a World Congress and Exposition, sponsored by more than a score of major U.S. government, international and other agencies and groups, in Atlanta, Georgia. Contact: The Bio-Energy Council, 1625 Eye Street, N.W., Suite 825A, Washington, D.C. 20006, U.S.A.

In Asia...

THE SOUTH KOREAN government has begun to crack down on pollution-causing enterprises after a one-year grace period.

Among the 16,546 suspected pollutioncausing enterprises, investigations will be conducted on firms which consume more than 1,000 tons of solid fuel annually or emit more than 500 cubic meters of industrial waste water daily.

Automobile exhaust checkups will also be started soon.

THE INDONESIAN MINISTER of State for Development and the Environment, Professor Emil Salim, said that Indonesia is facing three major problems in developing the environment: first, the relationship between the environment and poverty—poor people just exhaust the land to meet their daily needs; second, the public ignorance of the need to preserve the environment; and third, the lack of experts and skilled workers who can deal with environmental problems.

In order to ameliorate this situation, a cooperation agreement was signed in August between the Indonesian and American governments to develop the Environmental Study Center at the Bandung Institute of Technology.

PHILIPPINE NATURAL RESOURCES Minister Jose J. Leido, Jr. said that the Ministry of Natural Resources (MNR) will closely monitor reforestation activities of the country's 280 timber concessionaires.

It was noted that some timber croppers and private citizens make serious attempts to reforest denuded areas, but a large segment of loggers neglect their obligations.

Leido warned that the government will cancel the timber licenses to companies whose reforestation performance is substandard.

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Bangladesh will reforest barren areas and plans future forests

DACCA—The Bangladesh government will begin a two-year reforestation plan to replenish the country's dwindling forest reserves.

Forests now cover only nine percent of Bangladesh's total land area. Environmentalists claim that the severe drought which hit the northern region of the country this year was due to the scarcity of forested areas.

Meanwhile, a national forest policy—the country's first since independence in 1971—has been announced. Policy measures are aimed at preserving existing forests, reforesting coastal areas, acquiring land around the Bay of Bengal and drafting new laws to protect the forests.

Presently the country's Forest Department has a program to plant trees on 14,800 hectares by the end of next year.

AHMED FAZL

Fouled Philippine waters are a source of protein-rich algae

MANILA—An international team of scientists at the University of the Philippines (UP) has successfully shown that wastewater can be treated naturally and recycled for agricultural and industrial use. At the same time, the process produces high yields of algae which can be used as food for poultry, pigs and fish or for feedstock in the production of methane gas.

The pilot plant for water treatment and algae production was set up in the UP campus in Diliman, Quezon City, with the support of the United Nations Development Program as part of the water quality management activities of the Laguna Lake Development Authority. The objective of the experiment, started in 1977, was to determine the feasibility of the process for sewage treatment and reclamation of wastewater and to protect Laguna de Bay, a source of water for Metropolitan Manila.

The bay which is drained by the Pasig River, is a sinkhole for many lakeshore towns and the lake waters contain excess nutrients. The resulting high algae growth impedes the flow of the water and chokes marine life in the lake—a major site for extensive fish farming.

Sewage from the campus community in Diliman was channeled to two ponds, each having a small pond in the center. The outer ponds, designed to accelerate algae growth, were equipped with paddle wheels which mixed and aerated the water. The center ponds were designed to collect excess algae to drain and dry in the sun.

Production averaged about 47 metric tons, dry weight of algae, per hectare a year. Total cost of production of the dried algae was estimated at about one fifth the cost of comparable protein sources such as soybean or fishmeal.

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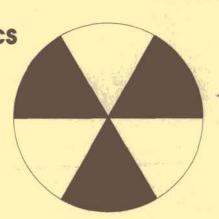
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Nuclear politics dominating West German campaign



MUNICH—Nuclear energy and its threat to the environment has dominated West German political thinking this summer because tacticians are realizing that the "green vote bloc" may well be the swing factor in the next nationwide elections.

The issue has cut across party lines, threatening to split all major parties within Parliament. Fence-straddling has made it difficult to predict intra- and inter-party voting patterns, leading many experts to predict that party discipline may disintegrate under nuclear power pressure.

The waste disposal issue has evolved into a lovely Catch-22: Last May the Christian Democrat State Government in Lower Saxony decided against the Federal Government's plan for an integrated final waste disposal and reprocessing center in the state of Gorleben. Lower Saxony State Premier Ernst Albrecht indicated that he thought Bonn's idea was good scientifically, but was not now feasible.

This tossed the ball back to Bonn and its nuclear power proponents—increasing in number with the oil squeeze: Unless waste disposal could be solved, no new plants could be built and present ones may have to close.

To avoid slamming the door completely, Albrecht suggested using interim waste deposits as an alternative, and the Federal Government has come up with a similar five-year plan. This calls for short-term deposits for five years, to be followed by interim deposits for as much as 30 years, and then long-term deposits for 50 years. Bonn's next two steps would call for final treatment and final deposit in an integrated center like the one originally planned at Gorleben.

Many German states oppose the entire "interim route" because they fear these deposits could well wind up becoming final ones.

Bonn would like at least three states to agree to set up interim deposits. Lower Saxony is willing, as is North-Rhine Westphalia, the most populous, but Bonn would also like a state in the south and there looms a weighty problem in the figure of Franz-Josef Strauss, a massive government opponent.



In Europe...

THE NORWEGIAN GOVERNMENT is supporting a test program to use Gulf Stream energy.

The Bolsoenes shipyard of Molde has been granted \$168,000 to construct a specially designed system to pump Gulf Stream waters for heating the greenhouses of a local gardener, Erling Haukeboe.

Money for the two-year project has been granted by the National Development Fund, the Petroleum and Energy Ministry and the National Council for Technical and Scientific Research.

The Haukeboe nursery is located near the west coast of Norway and is one of the country's most modern.

ENGLAND'S ALTERNATIVE ENERGY technology (AT) groups held an information sharing festival, Comtek 79, in Milton Keynes, Buckinghamshire over the August Bank Holiday weekend. The site is especially appropriate—this new town has two prototype solar-heated municipal houses, built by the Development Corporation. It is also the home of Open University which is broadcast on national TV and radio and has a major research center for AT.

AT groups throughout the country are pooling information and expertise through an umbrella organization, the Network for Alternative Technology and Technology Assessment, NATTA. Dr. Godfrey Boyle, an Open University lecturer, and his colleague, Dr. David Elliot, organized the festival with NATTA.

Participants included major environmental organizations, research groups and housing cooperatives and communes. Displays and demonstrations included solar and wind power, various small-scale devices and experiments, transportation, housing renovation, rural crafts and organic farming.

THE PORTUGUESE FORESTRY DEPARTMENT reports that approximately 30,000 hectares of forest, equivalent to an area four times the size of Portugal's capital city, Lisbon, have burned down in July and August this year. In the worsthit region, 77 percent of a 300,000 hectare forest burned to the ground in twenty separate blazes within a 24-hour period.

IN THE SOUTHERN ALENTEJO region of Portugal, local governments have issued a protest to the Spanish government over its decision to install a nuclear center at Valecaballeros, near Badajoz on the River Guadiana. They claim the plant would not only endanger local flora and fauna on the river beds, but would threaten an irrigation scheme at Algueva where a large dam is under construction.

Strauss is the conservative Bavarian State Premier and chief of the state's Christian Social Union (CSU)—the sister party of the Christian Democrats. More important, he is the CDU-CSU chancellor candidate in next year's election and is taking dead aim at Schmidt on every issue he can.

He has insisted on the original Gorleben concept and is only willing to accept what are called compact deposits. Since there are doubts that these would be either legal or safe for more than a few years, Strauss is in effect blocking West Germany's nuclear program—which he has advocated in the past.

The Federal Government has one powerful lever, the requirement that nuclear plants prove six years in advance that their waste disposal is secured. States that want to continue using nuclear power are going to be forced to build depots to handle the waste.

Left-wing Social Democratic members have also been busy, with the focus at the moment on Baden Wuettemberg. There, party leader Gerhard Eppler wants to dismantle existing plants and bar new ones. The State party organization has voted against approving any new plants for the next five years.

The Young Socialists—the extreme and powerful left wing of Chancellor Helmut Schmidt's Social Democrats—have been organizing a campaign against nuclear power, which their own party advocates. They want to close present plants in stages and prevent any new ones from being built. They have joined with citizens' environmental groups in preparing a mass demonstration for October.

This means nuclear power has split the ruling coalition parties, as well as the opposition CDU-CSU. WILLIAM G. MAHONEY

WHO group asks more control and information on chemicals

COPENHAGEN—At a meeting organized by World Health Organization (WHO), experts from 12 countries urged strict international control over the proliferating number of new chemicals being produced.

Dr. J.I. Waddington of WHO, told a news conference that in Europe alone, one thousand new chemicals go into production each year.

The experts spoke out for a world-wide plan to deal with chemical pollution, claiming national legislation was insufficient to deal with the hazards of uncontrolled or improper use.

The experts stressed the lack of trained manpower in Europe to control manufacture of dangerous chemicals and ensure protection of the public, and emphasized the need for more international technical cooperation.

The group recommended that the public at large be given more information about hazards and that the confidentiality of chemical research be limited.

The proposals are being examined in detail by the WHO Regional Committee for Europe in Helsinki this month.

CONSTANCE CORK

Sweden may ban all chemical | More on Europe ... spraying of farms and forests

STOCKHOLM—Pressure is growing in Sweden to ban all chemical spraying of farms and forests.

It began in recent years with demonstrations and protests in the forests by environmental activists seeking to prevent aerial spraying to kill off undergrowth. Berry and mushroom pickers camped in areas slated for spraying and they picketed the air

But it was a recent demonstration in the heart of Stockholm outside Parliament which really caught the public's eve-and the politicians' ear. National elections take place in mid-September, and they were looking for vote-appealing issues. Sten Andersson, secretary of Sweden's largest party, the Social Democrats, told the demonstrators that if elected his party would outlaw all spraying by giving communities veto rights.

Overnight, chemical spraying became an election issue. The Communist party, long an advocate of the ban, challenged the Social Democrats and the Center, Sweden's second largest party. to act. Environmental groups demanded that the parties make their positions clear.

The government quickly set up a special parliamentary committee to look into the use of chemicals in farming and forestry. It is to study the consequences on employment, the economy and the environment should the use of chemical preparations be cut back or forbidden entirely. The commission also is to examine how raw materials and foodstuffs would be affected if such action were taken and decide on further research into the possibilities of substituting biological for chemical preparations in fighting weeds and for fertilizing.

Erik Jonsson, chairman of the National Union of Farmers, commented that if the harvest, and therefore the farm surplus. drops as a result of new rules about fertilizer and chemical weed eradicators, that would mean an economic loss for society and a smaller income for farmers which would have to be compensated by higher prices.

"What's the use of growing weeds" was a typical comment from

Said Prime Minister Ola Ullsten: "If we are prepared to accept the costs, we can, of course, stop the spraying of poisons in the forests entirely." But he added: "The forests are Sweden's green oil."

Sweden banned the use of DDT in 1975. It was the most effective defense against the destruction of tens of millions of dollars worth of trees each year by bark beetles and other insects. From time to time, forest owners make demands for the return of DDT but without much of a hearing in the government. Efforts to find effective substitutes without negative effects on the environment are continuing.

SPECIAL TO WER

IN THE IRISH REPUBLIC anglers have called for stringent penalties against polluters following fish kills in a number of well-known fishing

The River Suir Anti-Pollution Society in Tipperary, formerly one of the top fishing areas, has called for government action to prevent the total destruction of fish life in the river.

Salmon, perch and eels have been killed and other rivers throughout the country have been periodically affected. Anglers are talking of a national campaign to force government attention to the situation.

IN IRELAND, a preservation campaign has been mounted to save an area of scientific importance and a major tourist attraction.

The Friends of Pollardstown Fen was formed to protect a 132-hectare area of springs which supply the Grand Canal. The Fens are a haven for flora extinct in the rest of the country for 5,000 years.

The Friends are battling with Kildare County Council to seek reversal of a decision refusing a preservation order for the area. The protestors, numbering 150 at their inaugural meeting, feel that landowners want to get the Fens developed for speculative profit.

They fear that if landowners can succeed in having the Fens drained, the water supply to the canal will dry up, affecting local tourism which brings in thousands of tourists annually.

IRELAND'S TWO MAJOR CITIES have published contrasting reports on pollution.

While Cork has reported low air pollution levels and given an encouraging view of new industry, Dublin has shown increasing problems with noise pollution. But in the capital. smoke levels have continued to decrease, while the amount of sulphur-dioxide has risen slightly.

AN ANTI-SMELL POLLUTION SYSTEM has been installed in a fish processing plant a short distance south of Iceland's capital Reykjavik. It is called the money smell in Iceland, but nevertheless, what belches from the chimneys of the plant is obnoxious, if harmless.

The air-cleaning system was developed by Jon Thordarson, who has already patented his invention in seven countries.

The Science Institute of the University of Iceland tested the system. Their final report said that the cleaning of small particles is 94 percent, the smell cleaning is at least 94 percent and can be more and that its use of electricity is rather small in comparison with the use of power in other equipment.

In Eastern Europe ...

POLISH ENVIRONMENT EXPERTS warn that the Baltic is becoming increasingly dirty, and many beaches are in danger of being closed. In the Gdansk area, for instance, swimming is forbidden much of the time.

BULGARIA'S BEAUTIFUL BLACK SEA coast is almost completely built up. Tourist organizations have put hotels and pensions as far as 25 kilometers from the sea.

To save the coast, Bulgarian architects came up with a solution: build new hotels on the sea itself. Already several hotels on platforms have been erected for Black Sea oil prospectors. The "islands" will be converted into summer vacation centers, and new ones will be built—all linked by bridges.

Bulgarian environment officials approved the idea, which will serve to keep at least some of the sea coast intact.

SAFETY STANDARDS IN EAST GERMAN nuclear power plants are a great deal lower than in the West, according to a study just published in Bremen, West Germany.

The study was carried out by professors Jens Scheer and Klaus Baetjer of Bremen University. Among the points made were:

• East German reactors were not housed in safety containers as those in the West are.

• East Germany's maximum "safe" radiation dose was set at 500 millirems compared, for example, to the ceiling level of eight millirems in the United States.

The study said that East Germany's radioactive nuclear waste is buried in the deserts of the Soviet Union.

"FOLLOWING THE EXAMPLE of many states in Europe and America which operate wind power plants, Czechoslovakia too is considering the use of wind power," the Czech news agency Ceteka reported.

"Czechoslovakia could gain electric power from wind to an amount of hundreds of megawatts annually," the story said, "and wind power would supplement the planned operation of solar radiation installations."

It quoted Czechoslovak expert O. Valcik as finding that wind power could be harnessed in the region west of Prague, the Czech-Moravian highlands, the Ore mountains, the Carpathian mountain range in West Slovakia and the Danube lowlands.

USSR official says too much "emotion" about toxics

MOSCOW—Soviet Minister of Agriculture Valentin Mesyats says concern over the widespread use of pesticides and other potentially toxic chemicals in farming often reflects "more emotion than common sense."

Mesyats' comments, in the Soviet weekly, New Times, were in line with the official Soviet position that "rational" utilization of chemicals in this country poses only minimal hazards to the environment.

He stated, "Our scientists are working on the development of the kind of pesticides and other chemicals that are safe for man and beast, quickly decompose in the soil and entail no harmful consequences. Such chemicals have already been created, but we need more of them.

"Besides chemicals, wide use is made of microbiological agents and also biological methods of combating plant pests. But there is no getting along without rational use of chemistry," the Soviet agriculture chief said.

Meanwhile, a senior official of the Soviet Union's main environmental monitoring agency refused to provide specific information sought by WER's Moscow correspondent on ecological problems related to use of toxic chemicals. Sergei S. Khodkin, chief of the Office of International Scientific-Technical Relations at the Soviet State Committee for Hydrometeorology and Control of the Natural Environment, delayed for nearly four months before writing back that his agency would be unable to give a substantive response.

SPECIAL TO WER



Oman's ecocommitment keeps pace with progress

OMAN—As economic development accelerates in this small sultanate—212,500 square kilometers and a population of 820,000—so do environmental problems. With international agreements, education, planning, and baseline data studies, the government aims to coordinate continued development with sound environmental management.

Oman is a signatory of the regional Action Plan proposed at the UNEP Regional Conference at Kuwait. The Plan calls for an

international effort to protect and develop the coastal areas of Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

Marine pollution is already here—litter, tar balls, oil slicks, plastic and wood waste are obvious on the shoreline. One third of the population lives in a narrow strip along the coast.

The Office of Environment, with the International Union for Conservation of Nature and Natural Resources (IUCN) and the World Wildlife Fund (WWF), has organized a project involving data collection and monitoring of the five species of marine turtles which are found along the shores of the Indian Ocean. A permanent monitoring station is to be set up on Masirah Island to continue the studies of these turtles, an important food source for Omani fisherman.

Also of international importance, the wadi at Qurum, which serves as a nursery to many species of Indian Ocean fish and contains one of the few stands of mangroves in Oman, is slated to become a nature reserve. The wadi is now threatened by rubbish dumping and unplanned development.

Environmental education will play an important role in enlisting the help of Omanis. Programs are in place or planned in classrooms at all levels, including the colleges at Nizwa and Ourum.

Noting that future food, medicine and other resources may depend on the diversity of surviving wild species, Sultan Qaboos bin Said has supported a wildlife inventory and ecosystem assessment of Oman. IUCN and WWF cooperated in a study of the tahr, a small, wild mountain goat, and flora and fauna studies of Jabal Akhdar and Jabal Aswad areas were published in 1977.

A similar survey of the mountain region of Dhofar, unique in Arabia because of its monsoonal climate, has just been completed this year.

SPECIAL TO WER

A British firm is cleaning up the Nigerian capital of Lagos

NAIROBI—The Nigerian capital, Lagos, is a much cleaner place than it was a year or two ago. For the first time, most areas of this sprawling, crowded city get regular domestic trash collections. An industrial refuse collection and disposal system is ready to go into operation, to eliminate the piles of waste materials at many factories.

A British firm, Powell Duffryn Pollution Control, has completed 21 months of a 2½-year contract to introduce an integrated system of refuse collection and disposal in Lagos.

Thousands of tons of domestic trash, which had accumulated over many years, had to be cleared, and this has been followed by regular collection and disposal systems.

Large numbers of modern refuse collection and compaction vehicles are now operating in Lagos. A Lagos State Refuse Disposal Board was set up to take over from local government administration in the area, including Lagos city itself, and Nigerian nationals are being trained to take over the operation next year.

CHARLES HARRISON

Electricity ...

THE SOVIET UNION and Czechoslovakia have signed a contract covering delivery of components and installation of a second nuclear power plant—with an output of 880 megawatts —in Jaslovske Bohunice in southern Slovakia. The overall value of Soviet deliveries is expected to reach "several dozen millions of rubles" and it is reported that the Soviet-Czech cooperation will produce still more reactors in the next few years.

URBANOLOGIST Dr. Rashmi Mayur says solarpowered satellites could help meet India's future electricity needs. Dr. Mayur is the only Indian appointed a director of SUNSAT, an American-based organization pioneering the use of satellites for electrical power. He believes solar satellites could provide electricity for at least 10 Indian cities—and be pollution free.

He hopes to see satellites 37,000 kilometers from earth using photovoltaic cells to convert the sun's rays into electricity, then beaming it to earth via microwaves or laser beams. The electricity would then be transmitted to consumers via a power grid.

Solar electricity will cost 10 cents a kilowatt compared with the present rate of 4.5 cents, but, Dr. Mayur warned, "By the year 2000, earthbound electricity will cost 12 cents a kilowatt." And so he strongly recommends building solar satellites now.

INDIA, with a population of 660 million, may have a potential surplus power capability.

The National Aeronautical Laboratory (NAL) at Bangalore is experimenting with producing electricity from human waste. The idea is to collect sludge gas from the Bangalore sewage plant and use it to run turbines.

A recent NAL study showed that the capital cost would be half that of a diesel generator installation.

NAL claims that Delhi, the capital of India, could have a 7.5 megawatt power plant operating on sludge gas, and a 3.2 megawatt plant at Bangalore.

electric power has reached the tiny town of Mandera, in extreme north-east Kenya. The power switch-on eased the lives of the 2,000 inhabitants—but it brought an unexpected problem when the town became littered with the corpses of dead vultures, electrocuted when they landed on the overhead power lines.

Zoologists say the vulture population will eventually get the message and avoid the power lines. In the meantime, local administrators have no way of stopping the birds from committing suicide (and cutting the local power supply).

On the Subcontinent...

AT A RECENT DELHI noise pollution seminar inaugurated by India's Health Minister Rabi Ray, participants complained that in the last 10 years the level of noise pollution had been increasing at the alarming rate of one decibel a year.

According to Dr. B.M. Abrol of the All India Institute of Medical Sciences, New Delhi, the first jarring sound was made by Adam who woke up Eve with his loud snores and was rebuffed.

INDIA'S NOISIEST CITY is Bombay—as any resident will testify these days—with continual festivals, during which loudspeakers blare Hindu film music 24 hours every day.

Besides, there are 250,000 vehicles in the city and 15,000 are added annually. Although most areas are designated as silent zones, motorists pay little heed to such rules and use their horns freely.

Experts say that Bombay has an average decibel level of 74, and this goes up to 130 in some industrial and market areas. Exposure to levels above 90 decibels is considered damaging.

THE INDIAN GOVERNMENT, together with Gujarat state authorities, are taking steps to protect the coral and mangrove "biocommunity" at Pirotan island in the Gulf of Kutch, on the coast about 800 kilometers north of Bombay. Before its comparatively recent deterioration, this area, along with its mangrove forests, was not only well known for its pearl fisheries but was also an excellent breeding ground for fish. The National Institute of Oceanography has submitted a report recommending that every effort be made to preserve this ecologically valuable territory.

MAN IS MOSTLY RESPONSIBLE for the floods that recently devastated Gujarat state in western India, said the managing director of the Gujarat State Forest Development Corporation.

S.A. Shah says the wanton destruction of trees, the unscientific cultivation of land—especially hill slopes—and over-grazing are responsible.

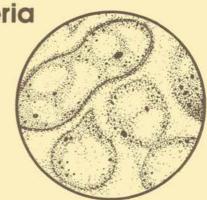
In a survey of floods which have occurred in India since 1953, he points out that every year about 6.7 million hectares of land are inundated, a third of which is crop land. The total annual damage to crops, houses and public utilities is around \$120 million, quite apart from the loss of human and cattle life. He puts the loss of soil nutrients at \$700 million each year.

He deplores the excessive emphasis on the engineering aspect of controlling floods to the exclusion of preventive measures such as afforestation, contour terracing and ditching of land, as well as small water retention dams.

Tar-killer bacteria

devour oil slicks

and tar-balls



GOA—Scientists at the National Institute of Oceanography in Panjim, Goa (on the west coast of India) are using bacteria to eliminate the long-term effects of oil slicks along its dazzling sandy beaches.

According to institute director S.Z. Qasim, a tiny flask of fluid containing the bacteria is enough to do away with tar deposits on a 16-kilometer stretch of sand. The bacteria thrive on oil and multiply rapidly. Initially isolated in a laboratory from a variety of other bacteria found in oil slicks, they are then mixed with kerosene and dispersed on tar surfaces on the coast.

After multiplying into millions of cells in a few days, the bacteria culture gobbles up the tar, then dies of starvation and dissolves into the sea.

The culture has been successfully tried on tourist beaches at Colva, Anjuna and Miramar. Dr. Qasim also claims that it can be used to clean up oil waste in ports.

India is among the worst sufferers from the oil spills of international tankers because the sea route from the Middle East to South East Asia, the Far East and Australia lies along its coast. Every five minutes, a tanker passes by the Lakshwadweep islands—a tiny Indian territory which lies 220 kilometers off the Kerala coast.

The tar, besides ruining beaches also threatens the livelihood of hundreds of fishermen.

The new "tar-killer" is claimed to be much cheaper and easier to use than methods employed in the West such as spraying with a special dispersant or soaking up the oil with a type of foam rubber.

DARRYL D'MONTE

Children near Taipei wear masks for metal-works pollution

TAIPEI—Pollution from a colony of metal-processing factories in a suburb of this capital city has become so serious that students in a nearby school have to wear masks most of the day.

The Taipei City Government has set up a special task force to persuade the factories to move to an unpopulated area of Taiwan some 40 kilometers to the southwest. But the factory owners are resisting because of the expense. They point out it would be cheaper to pay the fines imposed for polluting the environment

than to change locations or install pollution control equipment.

Taipei Mayor Lee Teng-hui is trying to end the impasse by allowing the factories to keep the profits which will accrue when their present land holdings are eventually changed from industrial to residential use. He is also trying to persuade the Taiwan Power Co. to install necessary power lines to the new site free of charge.

Taiwan's Health and Environment Protection Administration is opposed to the move unless adequate anti-pollution equipment is installed at the newly erected plants. Located close to the new Chiang Kai-shek International Airport, the factories might give a bad impression to arriving tourists, it is pointed out. The move also goes against the national policy of ending pollution all over Taiwan.

MICHAEL BOYDELL

Aquaculture research coordinated in Latin America

CARACAS—Fish farming experts met here last month to coordinate aquaculture projects that use agricultural and industrial waste to feed stocks.

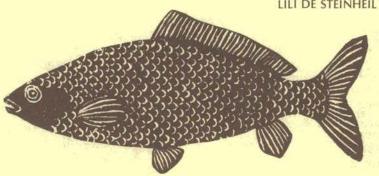
The meeting which took place during the Latin American Economic System (SELA) conference, established a Council for the Coordination of Research Centers for Fish Farming. The Council will publish a fish farming magazine and arrange for instruction, exchange of information and technical support in the different experimental sites. The Council will draft a pilot project for fish farming in Latin America with simultaneous experiments taking place in different countries to identify the species best fit for each region.

Fish farming technique as conceived for Latin America constitutes a complete ecological cycle, said one SELA spokesman. The fish are fed from wastes of agriculture or industry and provide an important source of cheap protein.

In Venezuela certain local species such as cachama (colossoma macropumum) and a fish locally called coporo are bred successfully, whereas Panama has started on an interesting hybridization program. In Peru, an African species, tilapia, has yielded excellent results.

Experts from Venezuela, Costa Rica, Cuba, Guatemala, Honduras, Mexico, Panama and Peru attended the meeting.

HILARY BRANCH LILI DE STEINHEIL



In Latin America ...

BRAZIL'S TOP BUSINESS EXECUTIVES have formed a private organization to help the government combat the energy crisis. The organization, called MEDE for Private Enterprise Mobilization for Energy Development, was described as a "loose, non-bureaucratic body comprised of volunteers."

MEDE is to provide assistance and business opinions to Brazil's newly created National Energy Commission.

One of the first concerns of the MEDE members is the problem of raising funds for converting such industries as cement, steel, ceramics and glass from petroleum to coal. Members say the problem is accentuated by the fact that the energy problem has hit Brazil at the same time as the return of a soaring inflation—expected to be over 50 percent this year.

THE COLOMBIAN CONGRESS is studying the possibility of creating a new ministry in charge of ecological affairs to centralize the many official and semi-official agencies concerned with the environment, coordinate local and international funding and serve as an ecological ombudsman on behalf of the public. The ministry also would be given responsibility for regulating Colombia's 1974 ecological code, much of which has yet to be enforced.

VENEZUELA'S CAPITAL CITY of more than 3,000,000 inhabitants faces a water shortage which government authorities say cannot be solved in the near term. A report issued by the National Waterworks Institute (INOS) stated that, "at any moment and for multiple reasons, Caracas' water supply may drop by 50 percent."

The report states that Caracas needs 16,000 cubic liters of water per second but receives only 11,000. Problems are: broken water pipes, power shortages, faulty pumps, and insufficient water in the reservoirs.

The principal reservoirs reveal cracks, heat warping, weed infestation and heavy sedimentation. Further, the water treatment plants are overloaded and the quality of water supplied to the city is poor.

A new distribution system, Camatuy, is almost ready, but since it will use the same water sources, Caracas will continue to be short of water. Now, six months after the change in government, water rationing continues and parts of the city are totally dry on weekends.

New Fuels ...

THE PHILIPPINE BOARD of Investments (BOI) is encouraging businesses to build alcohol distilleries and grow sugarcane and cassava as raw materials for the manufacture of alcogas. Incentives include capital gains tax exemptions, tax allowance on investments and tax exemption on stock dividends. The BOI is also studying the possible exemption from a 10 percent tax on imported equipment, reduced income tax and special tax credit. The Philippine government expects 10 anhydrous alcohol distilleries to be completed by 1986. Initially, two distilleries with a capacity of 120 kiloliters per day will be started next year for completion in 1981 in Piat, Cagayan and in Hinobaan, Negros Occidental or Tolong, Negros Oriental.

PAPUA NEW GUINEA is planning a fuelprocessing factory using material extracted from the tropical, starchy cassava plant.

Deputy Prime Minister and Minister for Foreign Affairs and Trade Ebia Olewale says the product will be used to operate power engines and possibly motor vehicles. It is hoped production will reduce the country's dependence on imported fuels by 20 percent. Land in the Suku Valley, in the Southern Highlands, has been set aside for the project.

DASHWOOD FLETCHER INTERNATIONAL, a sister company to London's Dashwood Finance, is currently negotiating with the Philippine government to produce a sugarcane-based motor vehicle fuel called alcogas. Dashwood is currently engaged in the construction of a sugar refinery for the Philippine Sugar Commission at Batangas on Luzon Island. The new plant will produce 550 tons of refined sugar per day and alcogas will be in production in the country within 18 months.

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lxtoc-1 oil flow lessens but problems increase

MEXICO CITY—International experts on the effects of hydrocarbons on marine life have been brought to Mexico to assist the government in assessing possible environmental damage by the runaway offshore oil well lxtoc-1 and in recommending ways to combat any damage.

Invited by the Mexican government, the team just finished a three-week study and advisory visit. Members were recruited and are being financed by UNEP with Jose Lizarraga, director of UNEP regional office for Latin America and the Caribbean, coordinating activities. The results are not yet in.

Lizarraga, who only assumed his post five months ago, noted in an interview for WER in Mexico City that the spill has taken much of his time in the last two months. The well, off the Yucatan Peninsula, blew out June 3.

"There has been very little experimentation in the effects of hydrocarbons on life in warm waters," he said. "Previous major spills have occurred in cold waters. For these reasons, we cannot predict the magnitude of damage."

Lizarraga said he was recently in the city of Veracruz and saw blobs of congealed oil in the water—as well as shrimp which "were doing just fine." Shaking his head he said, "We just don't know what the damage might be."

Meanwhile, the U.S. and Mexico have become embroiled in a quasi-legal battle over who will pay for the cost of cleaning up Texas resort beaches, where oil from the well washed up. Mexican president, Jose Lopez Portillo has said he is satisfied that Mexico has done and continues to do more than any other country to stop a runaway oil well and minimize damages, and he is satisfied that there is no applicable international law.

Reaction in Mexico is unanimous support of the president's position. This, in itself is unusual and shows the magnitude of the threat Mexico feels by the U.S. suggestion. It is seen as an attempt at pressuring Lopez Portillo in order that the U.S. may buy crude oil or gas at low prices.

He has said that the U.S. is aware that there is no applicable international law and that it has, in fact used that to its advantage in the past. When 13 Japanese fishermen died of radioactivity from a U.S. atomic explosion and when prime agricultural land in Mexico was ruined by the increasing salination of the Colorado River due to U.S. irrigation, the U.S. refused to accept responsibility and said that no specific laws applied.

Lopez Portillo will address the UN September 27, and is expected to bring up the topic of shared international responsibility for environmental disasters such as lxtoc-1.

On September 28 President Lopez Portillo is scheduled to meet President Carter in Washington, D.C., at the invitation of the U.S. president.

Meanwhile, back at the wild well, work progresses with everyone hoping that hurricanes stay well away from Ixtoc-1.

As Pemex works against the calendar to close the well—now down to 10,000 barrels leakage per day—four additional U.S. firms have been contracted to help.

KATHERINE HATCH



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Mexicans
hotly debate
oilspill
but ignore
its eco-effects

MEXICO CITY—Officials here continue to treat the runaway oil well, Ixtoc-1, as a mechanical accident despite continuing warnings from Mexican scientists of possible long-term ecological damage from the 15,000-20,000 barrels of crude gushing daily into the Gulf of Mexico.

Virtually every aspect of Ixtoc, except environmental effects, is discussed publicly and in the national press and on television. Many aspects are political in nature.

As oil was washing onto resort beaches of south Texas, some politicians in Mexico City were calling for the resignation of Mexico's oil chief, Jorge Diaz Serrano, not because of what the oil was doing to the Gulf and beaches but because they questioned whether Serrano—appointed to direct Petroleos Mexicanos by President Jose Lopez Portillo—really had sold his stock in an oil drilling contract firm he founded years ago.

In the same mood, a Pemex spokesman announced that other oil exploration and production projects may be delayed because of the men, materials and money—around \$40 million—thrown into attempts to shut off lxtoc. One "minor" expense, according to Jesus Cabrera, Pemex coordinator of oil slick control and contamination prevention, is the rental of airplanes to spray the slicks with chemical dispersants. That the planes are leased from a Canadian firm, Conair, and the dispersant is made by Exxon of the U.S. are subjects of public criticism.

Cabrera said he and others involved with Ixtoc feel the U.S. and other countries are trying to take advantage of the accident. An "avalanche of salesmen" has tried to sell schemes to control the wild well, he said, adding that some of their ideas are good, some are phantoms.

Touching briefly on possible ecological damage, Cabrera said complaints had been received from Mexican shrimp fishermen fearing oil damage to marine life. Samples of all sea species were collected and sent for analysis to the Mexican Petroleum Institute in Mexico City, he said. The analysis: "No damage revealed."

Only a few voices are raised in alarm. One is that of Ernesto



In Latin America ...

BRAZIL'S MINISTER OF ENERGY Cesar Cals said that petroleum is still the cheapest form of energy available.

The minister is a great proponent of hydropower and nuclear energy and has spoken more than his predecessor about the need to develop non-conventional forms of renewable energy. Brazil's gasohol project has received its biggest push since Cals came to the cabinet.

But the minister's three-point energy policy stresses petroleum:

- intensify the search for oil
- greater efforts for oil conservation
- development of alternative sources to substitute for oil.

"If there is oil in Brazil, we will find it because we are making every effort to increase national production," the minister said. "Finding petroleum is still the cheapest form of obtaining energy."

MEXICO plans to start adding methanol to gasoline sold in the densely-populated and industrialized Valley of Mexico. With the entire oil industry part of the government, such a project is relatively easy.

Jorge Diaz Serrano, director of Petroleos Mexicanos (Pemex), the government oil monopoly, did not mention the valley's atmospheric pollution—mostly caused by vehicles and ranked by experts as among the worst in the world—in disclosing that methanol will be added to the government-produced gasoline in an effort to "improve combustion."

He noted that Brazil has had success with the mixture using as much as 14 percent methanol in sea level communities. Mexico will begin with a lower level, he said, and will experiment until it reaches the best mixture for the 7,575-foot-high capital city and its environs.

THE COLOMBIAN GOVERNMENT and private enterprise have begun feasibility studies for the creation of an agrichemical industry to produce ethyl alcohol as a gasoline substitute.

The group is composed of the government petroleum enterprise Ecopetrol, the National Planning, Department, the Industrial Development Institute, the National Association of Industrialists, the National Coffee Growers Federation, the Inter-American Center of Tropical Agriculture, the Spanish firm Sucromiles, as well as the sugar cane growers associations and liquor distilling firms. The agrichemical industry would process sugar cane, yucca and potatoes for ethyl alcohol.

Preliminary studies show that by 1982, production of ethyl alcohol could reach 2.5 million liters per day, substituting for 20 percent of the country's gasoline consumption, a \$230 million annual saving.

Chavez, chief of the laboratory in the Marine Ecology School at the National Polytechnic Institute, Mexico City. Normal fish life will be suspended "possibly for two years" in areas heavily affected by the oil, especially in Campeche Sound where the well is located. "Chronic contamination" may remain in the Gulf for the next decade, he said.

Another scientist, Ingevar Emillson, predicted the oil would hit the U.S. and Mexico beaches by August—soon after the well blew out on June 3. Emillson, an oceanographer at the National Autonomous University of Mexico, began charting Gulf currents in 1970 and last year studied the Ixtoc-1 area. His finding was overlooked—or ignored—by Pemex which in late July was still saying "the quantities of oil that we have in the sea are definitely very small." In early August Pemex prophesied the oil probably would not reach any beaches.

Pemex is taking positive steps to close the well. After a special gel was pumped into it in late July, the flow of oil was reduced. In mid-August, after some 50,000 metal balls were shot down it, the flow was further reduced to between 15,000 and 19,000 barrels of oil daily. Fines for individuals or firms contaminating the Gulf have been announced by Pemex with oil-related violations costing from \$3,311 to \$57,395. Word of the new fines reportedly has been passed to all those working in offshore oil activity.

Recently, the head of Mexico's Department of Fishing said permanent ecological studies will be conducted in Campeche Sound. "In eight months, we will know the effects of the oil and dispersants on the flora and fauna," said Fernando Rafful, but until now, no damage to Gulf species has been detected, he said.

The idea that a little oil is good for sea-life has been advanced by at least two officials. Governor Enrique Cardenas of the state of Tamaulipas (just below Texas on the Gulf coast) recently observed that hydrocarbons are rich in proteins and do not hurt sea plants. There is always a little oil in the water around Tampico, he said; tourists become accustomed to it.

Jose Luis Garcia Luna, Pemex chief of petrochemical development, said at a news conference that petroleum is a natural ingredient in the Gulf, a substance which microorganisms can metabolize, transforming it through a chemical chain into food for other species.

Among the general public, there is little interest in Ixtoc or its possible damage to the environment. There are no environmental protection citizen groups in Mexico. The unofficial—or perhaps, official—attitude toward environmental risks in industrial development was expressed in mid-March by Humberto Romero Alvarez, Mexico's Sub-Secretary for Environmental Improvement. "We cannot quit taking advantage of our resources," he said, "even at the cost of provoking certain ecological disequilibrium."

Two relief wells to take pressure off Ixtoc-1 and halt its flow are now more than two-thirds drilled. Sometime in September, the wild flow may be stopped.

But oceanographer Emillson has consulted his charts of the Gulf currents and came up with a new prediction: In about 10 months, oil spilled in the July collision of two tankers off Trinidad and Tobago should have made its sweep of the Gulf and will be reaching the south coast of Texas.

KATHERINE HATCH

UN development conference ignores environmental impact

VIENNA—"Environment? Never heard of it," said a Western delegate cynically in the concrete-lined corridors outside the two-week United Nations Conference on Science and Technology for Development. Four thousand delegates from 135 countries and over 100 international institutions have been meeting to discuss a better distribution of the world's scientific and technological facilities between the industrialized and the developing countries.

At this conference the developing countries are supposed to be laying the foundations of their future scientific progress, with all its implications. And yet, as delegate followed delegate to the platform to make the obligatory 15 minute speech, there was seldom even a fleeting reference—occasional warnings from the West—on the environmental consequences of unbridled development.

Environment had no place on the conference agenda. It was not included in any of the major themes to be discussed by the two working groups who, behind closed doors were hammering out the real conclusions of the conference. They were concerned with patents, with cash, with new U.N. institutions to be set up to administer funds. "Environmental considerations are a luxury we simply can't afford," said a developing country's delegate, again in the off-the-record atmosphere of the lobbies.

But WER finally tracked down a single delegate carrying the banner for environment. Walter Shearer is a young program officer in the Natural Resources Program at the United Nations University.

The University, based in Tokyo, is part of UNESCO and in five years of operation has developed a global network of research and training centers.

Shearer is not entirely pessimistic about the environmental situation in the developing countries, even though it is not an issue at this conference. "They need institutions and organizations to the benefit of all," he says, "and they can't expect anyone to help them. They will have to do it themselves."

SUE MASTERMAN

Romania is aiming for energy self-sufficiency in 10 years

MUNICH—Romania has drafted a research and development program for energy self-sufficiency by the end of the 1980s.

The Romanian news agency Agerpresse reported that after debate at party meetings throughout the country, the plan will be submitted to the highest forum of party leadership—the Communist Party Congress—in November.

The program stresses nuclear-power stations for electricity, intensified prospecting for coal and for oil and gas under the Black Sea continental shelf, a study of geothermal water reserves, and energy conservation.

WILLIAM G. MAHONEY

Environmental Management . . .

THE U.S. ENVIRONMENTAL PROTECTION AGENCY is taking a tentative look at reversing the transfer of technology. The agency has set up a brand-new pilot project to search overseas for ideas in environmental protection that might work in the U.S.

EPA program manager William Burke says the agency may find enough novel approaches to pollution control overseas to set up a permanent conduit at EPA to keep ideas flowing in this direction. And, Burke says, the agency can save money by first looking abroad before investing in local development.

The idea of learning from abroad germinated at the Council for International Urban Liaison, a two-year-old non-profit group in Washington, D.C., that gathers information on how to improve urban living.

ARE INDUSTRIALIZED COUNTRIES exporting dirty industries to developing countries? So far, there is little evidence to show that this is actually happening, according to an interim report by the Conservation Foundation (USA). The report, which covers the OECD countries, concludes that while the lower costs of production made possible by less stringent environmental regulations is a factor, there are other more important elements that determine site location in a developing country. These include labor supply, access to raw materials, market potential, stable political systems and transportation.

THE PROBLEMS OF OUR CITIES and how to solve them are the subject of a series of publications put out by the Council for International Urban Liaison. One newsletter, the Urban Edge, is written to give information to city planners in developing countries. Other publications are aimed at telling Americans what bright ideas urban planners overseas have come up with. Contact the Council at 818 18th St., N.W., Washington, D.C. 20006, USA.

A SEMINAR, "Environmental Impact Assessment," will be held Sept. 24-29 by the UN Economic Commission for Europe (ECE) in Villach, Austria.

It will study the impact on environment of patterns and policies for economic development. Participants will try to formulate recommendations on basic principles for assessment. A spokesman said these recommendations should help public authorities who review, or authorize reviews, of economic development plans, programs and projects.

In Europe...

NORWAY'S Ministry of Environmental Affairs has announced that effective July 1, 1981, there will be a complete ban on the production and import of aerosol cans using chlorofluorocarbon propellants.

Researchers in several countries have found that CFC propellants reduce the earth's protective ozone shield, allowing excess solar ultra-violet radiation which may cause skin cancer.

The two-year lead was set to give Norwegian producers time to adjust to the new regulations. The United States and Sweden have already imposed similar bans. Regulations forbidding CFC cans are also expected in Canada and many other countries, the Ministry said.

It pointed out there are many good alternative propellants to use in aerosol cans and that the change will hardly be noticed by consumers.

A BRITISH FIRM, Viking Packaging of Droitwich, Worcestershire, claims it is within eighteen months of commercially producing degradable plastic bags.

Plastarch and Biostarch, the key ingredients, have been patented by their producers, the major flour-milling group of Spillers.

Plastarch accelerates degradation in the presence of oils and minerals found in most garbage dumps, and Biostarch contains mineral salts as well as oils which hasten plastic degradation when it is buried under the soil over a period of three to four years.

Manufacture of the degradable plastic is said to be cheaper, and the plastic unaffected by light and easier to handle.

Extensive tests on the bags are now taking place at a major bakery.

THE DUTCH have soundly rejected any future expansion of the country's nuclear energy industry. Sixty-six percent of those questioned in an opinion poll taken recently by the National Statistics Institute said they consider the construction of new nuclear power stations "inopportune" compared with 36 percent who held the same opinion in 1973 and 52 percent in 1975. The poll comes in the wake of large antinuclear demonstrations in the Netherlands.

There are presently only two nuclear reactors in the Netherlands, supplying a total 500 megawatts, a small percentage of the country's power needs.

And the government recently announced its intention to develop the country's large natural gas reserves rather than forge ahead with increased nuclear power.

Norwegian industry is becoming pollution-free, but it costs

OSLO—Ever since 1974 when Norway's parliament, the Storting, passed a law ordering industries to clean up wastes affecting the community, more than \$600 million has been spent. By 1984, when the pollutant cleansing program is to be completed, investments will have reached \$1,000 million, says the federation of Norwegian industries.

The Federation calculates that investments for in-house environmental measures will be just as large because of the Work Environment Regulation Act. The government expects that implementation of this act will cost between \$200 to 400 million. The Federation of Norwegian Industries expects the amount to be higher. It says the total cost of in-house and external environmental measures will be 25 percent of the total investment in industries from 1977 to the mid-1980s.

The Federation says environmental investments may be at the expense of "productive investments" needed to remain competitive, especially in the export industry. Of the total investments in cleaning systems, between 70 and 75 percent have been made by these industries, the Federation said.

SPECIAL TO WER

Free scientific expertise given eco-groups in Holland



AMSTERDAM—A science-for-the-people initiative begun three years ago on an experimental basis has proved so effective that the Dutch government, initially opposed, recently pledged financial support for an indefinite period.

"It has been a long fight," explained Bas de Boer, a leader in the battle to legitimatize Holland's 12 "science shops," or storefront science advisory groups, "but now I think we're here to stay." He is one of two half-time paid staff members of the science shop at the University of Amsterdam. All other staffers are volunteers.

The shop offers expertise to environmental groups and other "disenfranchised" organizations free of charge. First the university gave it "official status," then the Dutch government, which enjoys veto power over the university budget, gave it an annual sum of 50,000 guilders (about \$25,000).

"Our expectations are that the government will soon follow suit by financing the other university science shops in Holland, which are now operating on a volunteer basis," De Boer told WER.

"In the past, the main problem of placing the resources of the scientific community at the disposal of society—as opposed, say, to industry or government—has been a financial one," De Boer said.

"Our primary goal is to reorganize the way science is done at the

university, and for whom."

The idea of science shops (Wetenschapswinkels, in Dutch) took root during Holland's last Labor government (1973-77) when then-Minister for Science Policy, F.H.P. Trip, established advisory panels to increase public influence over government-sponsored scientific research. The panels included not only scientists and politicians but potential users of scientific research, including environmental organizations.

The Amsterdam science shop is run by a 24-member committee, half from the university (staff and students) and half from "society." It decides on requests for scientific assistance from the community and puts all or part of its 50-member pool of scientists to work on a project only if the request satisfies three criteria: It must come from groups 1) not able to pay for the work; 2) that are non-profit; and 3) that will act constructively with the assistance the shop would provide.

GARY YERKEY

Sweden pessimistic that acid rain will be stopped by EC act

STOCKHOLM—A new European convention against long-range trans-boundary air pollution could help save Sweden's dying lakes, but Swedish experts aren't optimistic.

The agreement, to be signed at Geneva in November by members of the United Nations Economic Commission for Europe, "lacks teeth," said Goran Persson, research chief of the National Environment Protection Agency (NEPA) in its monthly journal Environment News.

"It certainly is a disappointment that the convention won't contain any binding limitation on emissions," he added.

Persson said the international convention actually contains only a decision to begin negotiations on controlling air pollutants. But it should also lead to further research not only in measuring the spread of air pollution but also its effects on the environment.

Sweden and Norway claim that sulphur dioxide from Britain, Germany and other European countries is carried by the prevailing winds over the Nordic countries and there washed out of the atmosphere as acid rain.

The high acidic fallout suffocates lakes and rivers, kills fish and stunts tree growth.

To bring down the level of continental sulphur dioxide emissions would require years and tremendous financial outlays. Sweden has tried to set an example: Its stiff domestic regulation limiting the sulphur in fuel oil to one percent last year cost the country \$72 million because cleaner oil is more expensive.

According to the most recent NEPA survey, the pollution has grown worse. Some 20,000 lakes are said to be damaged or in great danger of being affected. Unlike Europe generally, Sweden's terrain is poor in limestone and therefore its waters are short of the buffering alkalis needed to neutralize acid. In an effort to compensate, Sweden now spends nearly \$4 million a year for liming endangered waters. To compensate fully for the acid rains would cost 30 times as much, said NEPA expert William Dickson.

SPECIAL TO WER

More on Europe ...

NORWEGIANS WILL BE FINED \$40 for not using the safety belts in the front seats of their cars.

This law is effective October 1st and applies only to cars registered after January 1, 1971.

Norwegians have been urged for more than two years to use their safety belts regularly. "Now they can only blame themselves that we had to go this hard way," said a spokesman for the Ministry of Communications.

The Ministry has carried out regular counts and said a system with fines could have been avoided if 75 percent of the drivers and front seat passengers had used their safety belts. At the latest count only about 60 to 65 percent used safety belts.

A £100,000 (\$200,000) research project in the Irish Republic will examine the possibility of using the nation's low-grade coal for electricity generation.

Ireland has large reserves of low-grade coal, but present technological levels have not found a way to use it in conventional boilers to generate electricity.

The research is to be carried out at the National Institute for Higher Education in Limerick and financed primarily by the Irish Electricity Supply Board. Results will be used to help develop a full commercial-scale plant in Arigna, County Roscommon in 1985.

THE IRISH are turning to the bogs for more energy. A new turf-briquette production factory is to be built at Ballyforan in County Galway on the west coast, bringing to 750,000 tons the targeted production from four factories run by the Bord na Mona, the government company which provides the turf-based fuel from the country's bogs.

SPAIN'S GREEN PATROL, a department of the Madrid municipal police that chases down noise polluters, has caught 5,000 culprits already this year, the department announced on the third anniversary of its birth.

Set up in July 1976 as one of the first environmental initiatives of post-Franco Spain, the Green Patrol, known officially as the Ecological Protection Patrol, said 70 percent of its offenders—mostly motorists violating automobile norms—have already been fined. The department is to acquire a computer shortly to help process the volume of work it generates.

Its 62 cars and motorcycles, bearing a characteristic green stripe, comb the Spanish capital seven days a week looking for noisy drivers and investigating citizens' complaints about noise, whatever its cause.

Land Use ...

OVER 2,500 TRIBALS (Aborigines) from forest lands just outside Bombay recently marched to the divisional forest authorities office to demand that areas where they traditionally collect grass and produce from trees be leased to them.

Technically, these areas belong to the Maharashtra government and the tribals are "encroaching" on them. But they insist that since the forests provide them with their livelihood, their rights should be regularized.

To demonstrate their awareness of the need to preserve nature's balance, the tribals planted about a hundred saplings over a distance of three kilometers along the route. They hold contractors responsible for destroying huge forest tracts.

THE FORESTRY DEPARTMENT of Thailand is considering amending the existing Wildlife Conservation Law to allow private individuals to keep endangered species for breeding or propagation for commercial purposes.

An increasing number of wild animals have been deprived of their natural habitat and many species are facing extinction due to illegal hunting and forest poaching.

THE INDONESIAN GOVERNMENT is planning to preserve its flora and fauna by developing 160 locations for wildlife conservation, eight national parks, 20 tourist parks and seven hunting and marine parks.

Minister of Development and Environment Control Emil Salim said the reserves and parks will cover 10 percent of Indonesia's forested area.

THE CORAL REEFS of the Philippines are fast disappearing, according to a study conducted by two marine biologists from Silliman University.

In the study, it was found that massive destruction has been caused by dynamite blasting, spear fishing by torch light and the mining of coral for construction purposes.

The study recommended setting up coral reef reserves and marine parks where the threatened species can be afforded protection from collectors.

any other city with a population of seven million. In spite of this parks are constantly being encroached upon by government and private bodies. A classic case is the current proposal to cut down several ancient and rare botanical specimens in the Jijimata Udyan—formerly known as the Victoria zoo—to make way for a public swimming pool now, and later, a film theater. The zoo is situated in the heart of over-crowded Bombay and is one refuge from the bustle of the polluted city.

South African planners and engineers draft eco-impact law

JOHANNESBURG—Professional planners and civil engineers in South Africa are advocating a law that would compel them to reveal the environmental impacts of all major projects.

The proposal for compulsory EIAs (environmental impact assessments) is based on the American system but with major modifications. The modifications are aimed at avoiding the extensive litigation which has characterized some American projects.

The plea for EIAs was made at a symposium of the Council for the Habitat titled "Shaping our Environment" held this August in Pretoria.

A paper proposing the law was drawn up by a team of five: Johannesburg's city engineer-planner, the city's chief law adviser, a private town planner, an engineer and a journalist* who represented the public's point of view.

The EIA proposal is unusual in that it demands that project planners, at an early stage, reveal in easy-to-understand language all relevant details so the public can decide on the merits of a project.

In case of a dispute, an ordinary Lower Court, and if necessary the High Court, must decide simply whether the EIA is a full and fair revelation of a project's impact.

Some authorities believe the legislation should go further. As the proposal stands, a project which is manifestly out of balance with an environment can still go ahead. It will be up to the conscience of project developers whether to fly in the face of informed public opinion.

JAMES CLARKE

*The author



Indian ecologists lose battle against hydroelectric scheme

NEW DELHI—Ecologists seem to have lost their battle to stop the Kerala State government from going ahead with the Silent Valley hydroelectric project on India's southernmost tip.

Silent Valley's rare tropical evergreen forest is home to several unusual species. The most endangered is the lion-tailed macaque. There are only 500 of these monkeys in the world, and half live in Silent Valley.

The state wants to build a 130-meter-high dam on the river that runs through the reserve. To put it up, nearly a thousand hectares of trees would have to be cut down, and the \$60 million dam

would flood nearly eight square kilometers of forest. Water from this reservoir would be diverted through a tunnel to a powerhouse located on the south-western slopes of the valley.

State authorities say the project will conserve water that otherwise flows into the sea, will provide 120 megawatts of electricity now, 240 megawatts later, and will irrigate 10,000 hectares of land in the Palghat district.

As early as 1976, the National Committee on Environmental Planning and Coordination suggested abandoning the project and declaring Silent Valley a national biosphere reserve for, it warned, "Silent Valley represents perhaps the last near-virgin forest of this type left in India."

The federal government's Department of Science and Technology has not approved the project. Some of its experts said that destroying the rain forest "may endanger the rainfall and climatic patterns of peninsular India." India's Home Minister, H.M. Patel, also urged abandoning the Silent Valley project and suggested the state put up a thermal plant instead—in another part of Kerala. A group of environmental scientists from Kerala argue that by building a 1,000 megawatt thermal power station outside the valley, the power needs of the state can be met without tampering with its ecological balance. Irrigation too could be provided by numerous lift systems. The disadvantage of this alternative is that it costs more and that coal would have to be shipped from northern India.

The Kerala government has set aside all counter-proposals, for when Morarji Desai, the former prime minister, gave state authorities a "green signal," he promised that every care would be taken to protect the ecology of the valley.

The state government said the Silent Valley Project Area Act imposes restrictions on construction of roads and buildings in the area, reduces felling of trees to the minimum, prohibits rearing of cattle and goats and imposes stiff penalties of up to three years imprisonment or a fine of \$250 or both.

"What more do they want?" asked the state's chief minister, Mr. Nair. While the state government feels that these safeguards are more than sufficient to safeguard the ecological balance of the area, ecologists fear that these safeguards will be paper only.

R. MURALI MANOHAR DARRYL D'MONTE

Indian engineers devise simple wave-powered generator

MADRAS—Electricity is being generated from the sea here off the coast of Tamil Nadu, in southern India. The wave-power generator used is a very simple device developed by engineers of the Madras Port Trust.

The power produced, though small (about 36 watts), may be the model for larger power stations. At present they are being used in light buoys.

The generator is based on simple arrangement of an unbalanced fly wheel which spins when hit by the rocking motion of the waves. Energy is transmitted through a set of gears to an alternator which produces power.

R. MURALI MANOHAR

In Asia . . .

THE PAKISTAN GOVERNMENT is exploring the possibility of exporting natural spring water in bottles to Saudi Arabia and other Middle Eastern countries.

Official sources said that Government has asked the Investment Advisory Center of Pakistan to prepare a pre-feasibility report on bottling the spring water for export. The report, they said, is expected to be submitted to the Government shortly. One aspect of the pre-feasibility study was to ensure that drawing off water for export will not adversely affect the supply of water to localities in areas adjoining the springs.

THE NATIONAL FEDERATION OF FISHERIES Cooperative in South Korea has asked for compensation for possible damage to its fish stocks by oil companies prospecting in the continental shelf adjacent to Korea and Japan.

The two concessionaires of the project, Ko-Am and Texaco, have been requested to deposit \$12 million with NFFC as compensation funds.

CHINA has imposed nationwide restrictions on motor vehicle noise for the first time.

Standards for acceptable levels were recently issued, and monitoring went into effect on July 1st.

JAPAN'S Environmental Protection Agency wants to strengthen its motor vehicle emission standards for nitrogen oxide. They are already the world's highest, well above what other industrialized nations are trying to attain.

The new standards announced by EPA require a 40 percent improvement in nitrogen oxide emissions from commercial vans and 25 percent for light trucks over their present performance by 1981.

THE HONG KONG GOVERNMENT is proposing legislation to control the collection, storage and disposal of all types of solid and semi-solid waste.

The Waste Disposal Bill 1979, gazetted in July, is the first of five bills aimed at providing better protection for the environment. (WER, April 9, p. 5).

A Waste Management Advisory Committee will be established to advise on a comprehensive waste disposal plan and the formulation of codes of practice.

The government is concerned that toxic wastes may be brought into Hong Kong for disposal purposes. Under the proposed legislation, an importer must obtain a license before bringing the waste into Hong Kong, unless the substance is being imported for manufacturing purposes. Failure to do so may result in a fine of up to \$10,000.

Down under . . .

THE SYDNEY, AUSTRALIA, CITY COUNCIL is uprooting 3,266 parking meters and replacing them with trees.

The move is not so much one of conservation as of resignation. Five million dimes have disappeared from the meters during the past year, so the council will switch over to a theft-proof ticket voucher system.

AUSTRALIA'S CHIEF MEDICAL advisory body has given a clean bill of health to a herbicide which is banned in the United States, where it was linked with birth defects and spontaneous abortions.

The National Health and Medical Research Council says that since there is no scientific evidence against 2-4-5-T, the NHMRC could not recommend restrictions on its use. Dr. William Langsford, first assistant director-general of the federal Department of Health, said that even when accidentally misused, "there is little evidence of real damage to humans." He added the decision was not final, but continually under review.

THE NEW ZEALAND agricultural chemicals board decided that existing safeguards on the herbicide 2-4-5-T here are adequate. It rejected warnings that there is evidence to show it causes miscarriages or human birth defects, and called the Oregon State (USA) study "grossly inadequate."

NEW ZEALAND is sponsoring the first major drilling program in Antarctica. The Department of Scientific and Industrial Research will begin, at the end of August, to drill 500 meters into the sediment of McMurdo Sound.

They hope core patterns will shed new light on 50 million years of weather patterns and marine and plant life on the continent.

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Australian auto habits are in low gear due to energy squeeze

PERTH—Australians, a pretty smug lot when it comes to energy resources, are becoming uncomfortably aware that the crisis is moving closer to home, especially near the garage. These signs of the changing times appeared in less than four weeks:

- A National Petroleum Advisory Committee was hastily set up to devise a national contingency plan to ration gasoline and oil supplies should Australia face a fuel crisis, which some think may come later this year. The joint state-federal committee will have 20 members. A \$2 million energy conservation campaign begins in October.
- An auction in Melbourne of second-hand luxury cars resulted in incredibly cheap sales. In Australia, where a new car—without fancy options—can fetch \$10,000 and a 10-year-old vehicle sells for \$2,000, the highest bid for a three-year-old air-conditioned sedan was \$1600.
- The Australian Gas Light Company in Sydney will install dual fuel systems in 500 commercial vehicles in the first mass conversion of such vehicles to natural gas. The gas kits, being installed for demonstration purposes, are being imported from California, cost about \$1500 to install, and use compressed natural gas.
- A Melbourne luxury car dealer is marketing an LPG (liquid petroleum gas)-driven Rover and plans to convert Jaguars and Mercedes-Benz automobiles as well. JANE NACZYNSKI-PHILLIPS

New Zealand overlooking rule requiring eco-impact report

WELLINGTON—Environmentalists in New Zealand fear that decisions to proceed with big public works projects are being made before environmental impact reports are submitted.

On May 1 a new paper pulp industry was announced for the picturesque Waimea plains behind Nelson, gateway to the South Island, without any provision for an impact report.

Environmentalists became uneasy about the official attitude to impact reports when the government claimed one was not required for a proposed ammonia-urea plant at Kapuni, a natural gas field. The government said production of nitrate fertilizers on the scale proposed at Kapuni will contribute only a minor amount to the nitrogen already in New Zealand's agricultural and forestry eco-systems.

JOHN KELLEHER

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A huge project is underway— Caribbean eco-management

NEW YORK—"It's been a nightmare," said Trevor Boothe, who is coordinating the UN's environmental management project in the Caribbean area.

Geographically, getting it together seemed impossible. Cosponsored by the UN Environment Program (Kenya) and the Economic Commission for Latin America (Chile), project headquarters is in Port of Spain, Trinidad and Tobago—"the worst communications in the Caribbean," says Boothe. He and his staff of two have to consult with 28 governments overseeing 160 million people on more than 35 territorial entities in the Caribbean and Gulf of Mexico. In addition, they must liaise with the entire UN system of coordinating agencies in New York, Geneva, Paris, Rome and Vienna. Not to mention other international agencies and NGOs.

Surprisingly, something is actually getting accomplished.

It began as a gleam in the eye of UNEP's Governing Council in 1974. By 1976, a program comparable to the Mediterranean Action Plan was being urged, but the Caribbean nations wanted to evolve their own strategies. So they identified common problems and the human and institutional resources available in the region. In May 1977, Boothe, a Jamaican diplomat, set up shop for UNEP and ECLA in Port of Spain.

The ultimate goal of the Caribbean Environment Project is an action plan for environmentally sound development. Boothe's job is to coordinate all the UN agencies, governments and NGOs in their task of investigating, consulting and collaborating. An advisory panel of regional experts is helping develop coordinated strategies.

A year ago September, all UN agencies, regional and international organizations met, agreed to the terms of reference for the substantive sectorial studies (agriculture, fisheries, energy, health, settlements, marine pollution, environmental legislation, natural disasters, tourism and critical areas) and came up with the funding—\$1 million. Results of the studies so far have been synthesized for the second advisory panel meeting, which begins today (Aug. 27).

By the end of this year, a draft action plan will be put before a meeting of experts from all countries in the region. And then, said Boothe, "They will, for the first time, come up with an assessment of priorities." And, he added, that will begin the implementation phase—for they will decide on financial and administrative strategies. Then the plan will be underway.

Boothe believes this "multi-disciplinary approach to environmental management represents a new model that can be adapted elsewhere." As for Boothe, he'll have "retired" back into Jamaica's diplomatic corps by then. LIBBY BASSETT

In Latin America ...

AN INTERNATIONAL LAW to protect nations against the possible harmful effects of climate control has been urged by Mexican scientist Cesar Luna Bauza. As director of the Center for Climate Forecast of the Gulf of Mexico in Veracruz, Luna Bauza specifically cited U.S. cloud-seeding practices over the Gulf.

"We need a law on the alteration of meteorological phenomena," he said, to allow nations to avoid disasters in their territory because of the actions of other nations. In the study and control of severe storms, U.S. climatological aircraft seed storm systems with silver nitrate. Other countries also practice this in the Caribbean and the Atlantic Ocean, he said. Effects on Mexico could be disastrous, he pointed out, if clouds are made to rain over the sea and not over the land, thus depriving crops of needed and expected rains.

SURINAM became the fourth country to ratify the Amazon Pact, after Brazil, Guyana and Ecuador. Bolivia is debating the question in Congress and Brazil is now courting Venezuelan support. The Pact is of Brazilian initiative and could have a tremendous ecological impact if its policy of an orderly and integrated development of the whole Amazon is carried out with environmental considerations in mind. The other big Amazon countries, Peru and Colombia, have yet to take any steps to ratify the Pact.

PETROBRAS, the Brazilian oil monopoly, announced that in the last four years the consumption of lead additives in gasoline has been cut in half. In 1975, Brazilians used 1,200 tons a month; this year it is down to 600 tons.

Petrobras attributed this reduction to a cutdown in the consumption of high-octane gas and the increasing amounts of alcohol added to all Brazilian gasolines as part of the gasohol plan. Alcohol performs some of the anti-knock functions of lead thus reducing the amount of lead needed.

CONTAMINATION OF BEACHES on Caracas' Central Littoral is due principally to "fecal matter" discharged into the sea by the majority of the industries and buildings along the coast, the Venezuelan capital's municipal council was told.

Those chiefly responsible are the Simon Bolivar International Airport, La Electricidad de Caracas generating plant, the National Waterworks Institute, the town of Catia La Mar and two beaches—Playa Grande and Marina Grande. In the eastern sector, the Macuto Sheraton Hotel was singled out as a contaminator.

Haiti's energy and environment future looks grim to surveyors

PORT-AU-PRINCE—Surveys from a number of sources paint a grim picture of Haiti by the year 2000.

There will be no wood or charcoal available for cooking. All of Haiti's trees will be gone in 10 years, according to one professional estimate, and so will most of its top soil, lost through erosion.

The population of this impoverished Caribbean island is expected to increase by 43 percent, energy consumption to go up by more than 250 percent, and energy costs to rise by well over 1,000 percent. Haiti has no known fossil energy resources. If future needs are met completely by importation, the costs would be about a quarter of a billion (1978) dollars a year and require a level of export activity far higher than can be reasonably expected.

To date, there are no Haitian organizations charged with planning and making the transition from fossil fuels to alternative sources of energy. But there have been lots of studies—by the U.S. Embassy, UN Development Program, Shell Oil Co., World Bank, and the Food and Agriculture Organization. Unfortunately, there is no action on them.

ARTHUR CANDELL

Peru prefers a home-grown solar energy industry

LIMA—Solar energy had an early history in Peru. In 1938, small workshops produced rudimentary installations for domestic use in Ayacucho in the central mountains and Arequipa in the south.

Today, the scope is about the same, or even less. A small group from Itintec, the government's industrial technology research institute, is carrying out research into the use of solar energy especially for small communities in the Andes. So far they have installed a pilot water distillation plant in Piura in the northern desert, plus solar water heaters and a solar chicken farm in the mountains.

Installation in Lima with its near-constant cloud cover is more problematical. Nevertheless, Itintec is working on a prototype water heater which could be run part-time on solar energy, the rest of the time on electricity.

Itintec says it is deliberately concentrating on developing a "cottage industry"—installations up to 5 kilowatts—for the experience. European companies are trying to sell equipment to Peru but, said an Itintec spokesman, "The problem with the foreign companies is that they sell their own designs which are suitable only for their brand of machine. And foreign equipment for industrial purposes is expensive. We'd like to develop our own mini-equipment here and then manufacture the bigger installations when we can."

Ecologically dangerous wastes | In Europe... must be declared in Sweden

STOCKHOLM-The Swedish government has decided that beginning next year companies must declare all wastes produced that could be dangerous to the environment. Up till now, this has been done only on a small scale. The information is to go to the National Environment Protection Agency (NEPA).

A mainly state-owned disposal company called SAKAB handles especially dangerous waste. SAKAB presently is seeking a new, more centrally located site for a modern works using the most up-

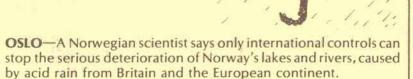
to-date machinery and disposal methods.

Opening a new waste disposal installation at Landskrona recently, Valfrid Paulsson, director general of NEPA, said, "Handling of all types of waste is one of the old problems which continuously needs to be solved. Nowhere in the world has a complete system been found for handling that extremely important environmental question." With an improved system, Paulsson said waste "should be regarded as a resource to be exploited for recycling on an increased scale."

For the budget year 1980-81, Paulsson estimated Sweden would invest 629 million Crowns (\$146 million) in waste installations.

SPECIAL TO WER

Norway calls for international controls over acid rainmakers



Lars Overrein, who heads a research project on the influence of acid rain on forests and fish says, "Fish are dying in larger numbers than ever this year," not only in southern Norway but much

further north.

He is especially worried that pollution now affects the great inland lakes and large watercourses. "Pollution there has so far been diluted and held in check, but this self-cleansing effect now appears to be no longer sufficient," he said. "We must get international control over the discharge of polluting materials."

Watercourses in southern Norway have been hardest hit by the increasing acidity. During the last 10 years more than 80 percent of all lakes in these areas have become so polluted by acid rain that fish cannot live in them. SPECIAL TO WER

IN SWEDEN, a proposal to codify all regulations dealing with the transport by road of products dangerous to the environment has been put before the government following an investigation by George Danell, former permanent secretary in the communications department.

Danell said it has long been obvious that dangerous goods must be handled in a uniform, coordinated way under a single supervising authority. At present some 20 authorities are involved in administering various regulations.

Danell also recommended that the movement of trucks carrying toxic and other dangerous products should be spread out in time to avoid pile-ups at ferry and other traffic terminals and should be permitted only on designated routes in larger communities.

BRITAIN'S DEPARTMENT OF ENERGY is financing a £1.5 million (\$3.08 million) pilot geothermal energy project.

It involves sinking a 10,000-foot well in a Southampton coalyard to produce hot water that would be fed into a nearby coal-fired electricity power station.

It would reduce the amount of coal needed and is expected to last between 30 and 50 years.

Possibly a parallel well might be dug to force cool salt water down the shaft to maintain pressure in the reservoir and for re-heating.

Three other geothermal sites have been identified in Britain: East Yorkshire, north of Glasgow and Cheshire.

The geothermal project is part of the Department of Energy's ongoing alternative energy program involving solar, wind, wave and tidal sources.

A NATION-WIDE ENERGY SAVING CAM-PAIGN will be launched in Norway in October. The campaign will at first be directed towards private consumers and later towards industry.

Minister of Petroleum and Energy Bjartmar Gjerde has made it clear there will be no rationing of gasoline or fuel oil for home heating this year, but he said the ministry is prepared for tougher measures if the supply situation gets worse.

The government has already ordered a list of possible petroleum-saving decrees which, if introduced, may include rationing, restrictions on driving and closing gas stations during weekends.

The energy-saving campaign will include regular information to the public about the energy situation, brochures advising people how to save gasoline when driving their cars and motor boats and how to economize on fuel when heating houses.

More on Europe . . .

MARIA TERESA ESTEBAN, a 39-year-old industrial engineer, has been appointed Director General of the Environment in Spain, heading a department of the Public Works ministry organized two years ago to coordinate the government's environmental offices. She is the second person to head the new department and the first woman to hold the post.

IRELAND IS LAUNCHING A DRIVE to create native sources of energy and reduce dependence on foreign oil.

The Electricity Supply Board has been told to undertake a fresh appraisal of the possibilities of wind power and will buy new wind generators for the west of Ireland. Hydropower, which at present represents less than 10 percent of the E.S.B.'s installed capacity, is also to be reexamined, as is tidal power, the usage of more coal and development of peat output from Irish

£4,500,000 (\$9 million) is to be spent on a project to burn biomass in a central generating station, probably sited at Bellacorrick in County Mayo. Solar energy may also be developed. Native "crow" coal is to be used to fuel

smaller power stations.

THE EUROPEAN COMMUNITY'S (EC) Euratom Supply Agency says that the development of nuclear energy in the Community has been proceeding at "a rather restrained pace."

The 1978 annual report said total nuclear capacity in the EC amounted to 10.2 percent of net electricity production. Only four nuclear power stations were newly commissioned in the nine Community nations, and only three plants (comprising six reactors) were "firmly committed and ordered."

Despite interruptions in the supply of natural uranium notably by the U.S. and Canada, "few supply problems are expected for users in the Community," the report said. But it urged "diversification of supply sources," noting that the U.S. remains the Community's most important supplier, followed by the Soviet Union.

ONE OF THE WORST FOREST FIRES in Spanish history has spread over more than 32,000 hectares of forest in the Southern half of Valencia province, destroying more than two million pine trees and causing damage estimated in the tens of millions of dollars, according to government experts.

The fire, with flames of more than 200 feet, spread to within 13 miles of a 975 megawatt nuclear plant under construction near the town of Cofrentes.

European eco-lobby is against EC's new toxic substances law

LUXEMBOURG—European Community Environment Ministers have agreed to establish a coordinated defense system against toxic chemicals being marketed throughout the nine member countries. But European environmentalists say the new law does not go far enough.

The EC law requires, in effect, an "identity card" for new chemical products coming on the market or imported into member countries. To qualify, a new substance has to pass tests to prove its safety, and its manufacturer must pass along those results to the national authorities involved. According to the Community's publication, Euroforum, "virtually all national governmental authorities would like to have some sort of international identity card so that the costly and lengthy tests which have to be performed on new chemicals don't have to be repeated for each country where the product is sold. The new community law will accomplish this in Europe, and discussions are also underway at the world level."

The European Environment Bureau (EEB), which lobbies for 41 groups at EC headquarters in Brussels, called the new law 'inadequate and short-sighted." In a letter to Douglas Costle, administrator of the U.S. Environmental Protection Agency. Hubert David, the lobbying group's general secretary wrote: "The EEB is very disappointed about this Directive and seriously doubts its positive effects on the environment.....'

They argue that the new law deals only with marketing new chemical substances, not their production. It does not allow for an exchange of information on their environmental effects. And they feel the 45-day notification period is too short to allow for proper screening procedures before distribution. David wrote that the new law "completely neglects" suggestions they wanted incorporated: that marketing a substance be suspended until sufficient information is gathered on risks vs. benefits; that it allow restriction or prohibition of substances with unacceptable environmental consequences; and that it include a long-term program to deal with substances already on the market.

"The EEB hopes," David wrote, "that the U.S. government will not amend its Toxic Substances Control Act in the direction of the EC Directive, and that in the necessary international... harmonization, the EC Directive will not play the role of reference and example." **GARY YERKEY**

Pollution is a serious concern in Soviet industrial cities

MOSCOW—A top Soviet environmental official says that despite widespread government clean-up efforts, pollution continues to be a serious concern in a number of Soviet industrial cities.

Yevgeny Fyodorov made his comments in the government newspaper Izvestia. He is chairman of the Scientific and Technical Council of the State Committee for Hydrometeorology and Protection of the Natural Environment.

Fyodorov contended that "the USSR's territory in general is polluted much less than that of the United States, West Germany, Japan and many other countries." Nevertheless, he wrote, "we cannot rest content with what has been achieved."

"The level of pollution in some Soviet industrial centers and areas gives rise to justified public concern, which is proven by critical letters Soviet people send to the press, radio and television," he said.

The academician noted that "many shortcomings in this field are due to inadequate attention devoted to environmental protection by some economic executives—and also to the idea, still persistent in some places, that the country's natural riches are allegedly inexhaustible."

Fyodorov's article did not specify Soviet cities where pollution problems remained serious.

However, the Communist Party newspaper Pravda recently disclosed that in the Azerbaidzhan city of Sumgait, the local party committee had imposed "strict reprimands" on a number of industrial managers for countenancing excessive pollution. Located on the Caspian Sea just north of Baku, it is the second largest industrial center in Azerbaidzhan.

Sumgait's party chief, Sh. Aliyev, said the situation was largely due to "physically worn-out equipment and unperfected technology."

Yugoslav citizens' protests change nuclear plant site

MUNICH—Citizens' protests in the Zadar area of Yugoslavia have prompted the regime to rescind its plans for a nuclear power plant there in what may be the first-ever case of a Communist regime bowing to environmental pressure groups.

The Yugoslav news agency Tanjug reported that Federal authorities had decided not to build a nuclear plant on the Adriatic island of Vir, near Zadar, following strong protests from residents of the area. Zadar is a medieval city with old churches and city walls, and tourism is its most important source of revenue. Instead, Tanjug said, Yugoslavia's second nuclear plant would be constructed on the Sava River at a village called Prevlaka in Croatia. It is scheduled to go into operation by 1990.

The Zadar Executive Committee presented its arguments supported by strong public opinion—in great detail and stressed that "regardless of all precautionary measures that might ever be taken, the construction of a nuclear power plant would negatively influence economic development in the area," an economy based on tourism.

The decision was announced by the director of the Croatian Electricity Board, Rade Pavlovic. He warned, however, that future plants would have to be built on the sea coast. Only nuclear plants could ensure Croatia regular electricity, and nuclear plants need a large water supply which only the Adriatic could supply, he said.

WILLIAM G. MAHONEY

In Eastern Europe ...

SOVIET DESIGNERS have completed plans for a new type of nonpolluting tanker, fitted with double-walled and double-bottomed oil tanks to help avoid spills in case of a mishap at sea, according to Tass.

The Soviet news agency said the ship would have a displacement of 84,600 tons, an oil capacity of up to 68,000 tons and a maximum

speed of 16 knots.

Tass quoted the new tanker's chief designer, Vladimir Vanurin, as saying its construction would require about five percent more steel than an ordinary vessel. However, he said this increased capital outlay would be offset by lower operating costs, because the double-tank design would reduce the amount of heating needed to keep the cargo viscous enough for pumping.

PROTECTION OF THE ENVIRONMENT was a major topic at a United Nations meeting in Poland on coal and will be back on the agenda at a meeting in Warsaw in September on the chemical industry.

The UN's Economic Commission for Europe (ECE), reported that "environmental protection in the use of coal" was a major topic at a Symposium on the Gasification and Liquefaction of Coal held in Katowice April 23-27.

The ECE will sponsor a Seminar on Forecasting, Programming and Planning in the Chemical Industry Sept. 10-14 in Warsaw to examine ways of improving the efficiency of these operations in Europe, North America and Common Market

THE POLISH MOUNTAIN RESORT of Zakopane is being overwhelmed by masses of tourists and industrial development. Local ecologists are worried and virtually powerless in the face of government policy to develop the area.

Zakopane is in the middle of the Carpathian Mountains in the Tatra Range. The whole area is divided into two national parks, the Czech Tanap and the Polish Tatrzanski Park Narodowy. In Czechoslovakia no industry is allowed near the mountains. Zakopane has a meat processing plant and a folk craft factory, a giant bakery is planned.

The average annual number of visitors was 60,000 before the war, now 3 million a year choose Zakopane over other equally beautiful areas. Mountain animals and flora are being damaged by the onslaught and mountain streams are drying up as Zakopane continues growing.

In Africa...

PURE SUNFLOWER OIL has been used to run a tractor for 100 hours in South Africa—and the pollution was much lower than with diesel fuel.

Only minor adjustments to the carburetor were needed, said J.J. Bruwes of the Department of Agricultural Technical Service.

If maize farmers set aside 10 percent of their lands for sunflowers and sent the seed to local cooperatives for milling, they would have enough for all their tractor work, he said. It was also possible, he added, for farmers to buy, at low cost, their own mills and filters. It would be possible, with large quantities, to produce sunflower oil at a price equal to diesel.

FARMERS IN ZIMBABWE RHODESIA are

preparing to become oilmen.

Government research engineers in Salisbury say they have perfected a method that uses soya bean and sunflower oils in place of diesel for tractors. Tobacco seed oil is being used in the manufacture of paint.

Chief research engineer John Spear said, "Half the tractors in this country could run immediately on soya bean or sunflower oil. The rest could have their fuel injection pumps modified. The performance is comparable to diesel. Within a few months, if our imported oil supplies are cut off, our farmers could keep themselves going."

ZIMBABWE RHODESIA'S Prime Minister Bishop Abel Muzorewa is embarking on a massive search for oil. The mining department has been asked to do an urgent detailed review of the country's geological makeup.

"If we could strike oil, it is we who could lay down the law to the Organization for African

Unity" he declared.

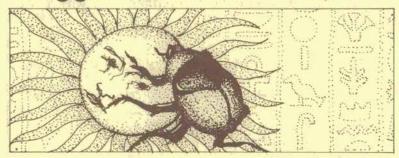
The chances are next to zero. While Zimbabwe Rhodesia sits on vast mineral resources, occasional oil prospecting by big companies, particularly in low areas bordering Mozambique, has always come to naught.

GHANA'S FUEL AND POWER Commissioner, Professor George Benneh, announced new measures to control fuel consumption in the country.

Private cars can buy petrol only on three specified days a week, 12 hours a day, for a weekly total of 36 liters. At first, queuing time was ranging from between two to eight hours for 12 liters.

These measures are in response to the 15 percent OPEC price rise in crude oil and to the cut-back of oil supply from Nigeria which supplies Ghana with 80 percent of its fuel.

The lowly dung beetle is doing a bigger-than-man-sized job



Ancient Egyptians thought the scarab beetle was so important pushing his great pellets of dung around that they immortalized him on their temple walls pushing the sun. This story shows the dung beetle still has a big job to do.

JOHANNESBURG—Australia has been losing, literally, millions of hectares of grazing land because cow pads (plate-sized cakes of cow dung) are poisoning it.

In a year, five head of cattle can smother a hectare of Australia's usually dry ranchland. It was estimated that Australia's cows and steers drop 350-400 million pads a day.

The highly nitrogenized grass becomes rank and unpalatable, and there is the additional problem of flies and cattle parasites that thrive in the dung. Farmers tried to combat the problem with costly chemicals.

Australia's Council for Scientific and Industrial Research Organization (CSIRO) began to wonder why cattlemen in South Africa with similar land did not have similar problems.

The answer was simple: Cattle are alien to Australia, and Australian dung beetles are good only for burying and eating the small pellets produced by kangaroos.

In Africa and the Middle East, pastures are picked over by hundreds of species of dung beetles. When cattle came south in Africa, some species, used to coping with elephants and buffalo, simply took to the same habit with cattle manure.

So the Australians asked the South Africans for help. A dung beetle research unit (DBRU) was established in Pretoria where beetles from Africa, Europe and Asia have been studied for eight years.

Research developed dung beetles, specially bred in sterile conditions, that can bury cow pads in 48 hours and prevent 96 percent of flies and 85 percent of parasitic cattle and sheep worms from maturing. The dung is buried in balls in which the larvae are placed by the beetles—thus putting the dung where it is most effective for enriching the soil.

"Dung beetles are an integral link in the grassland ecosystems because they recycle the plant nutrients in waste products, and make them directly available to improve plant growth," said project scientist Dr. G.F. Bornemissza.

Of 160 species studied, 44 beetles, plus 14 climatically or genetically diverse strains were sent to Australia. The results: From these eggs, hundreds of thousands of beetles have been reared and set free, and their progeny are spreading wherever cows are to be found.

One species, the ball-rolling Sisyphus spinipes, is now able "to suppress almost completely" buffalo flies in one area. In other areas bush flies have been heavily reduced and millions of pads buried.

Grateful graziers apply to have the beetles released on their ranches. And CSIRO in Canberra is now exporting thousands to the Pacific Islands and the USA, notably to Texas and California.

JAMES CLARKE

Ghana's top eco-official says sanitation is worst problem

ACCRA—Ghana's greatest environmental problems are sanitation, industrial waste disposal, water-borne diseases and land management.

Professor E.A. Boateng, Executive Chairman of Ghana's Environmental Protection Council (EPC), said sanitation remains his primary problem because the government accords it low priority and doesn't delegate responsibility to qualified professionals.

The EPC advises the government and its agencies on the overall environmental soundness of any approaches adopted, and it makes suggestions for improvement.

Professor Boateng said the Council had prepared a scheme for industrial waste disposal which incorporates the filing of environmental impact statements. He expects this will be compulsory, as a prerequisite for establishing industries. The Council, he said, was working on environmental quality standards and criteria to control pollution from industrial or other activities.

Practically all the major diseases of Ghana are associated with water, for most bodies of water contain dangerous pathogens and industrial waste. The Council has now presented a draft decree to the government outlining acceptable water quality standards and is looking forward to seeing it enacted into law.

Professor Boateng said research has been going on to determine the nature and sources of major pollutants entering the Korle Lagoon, which is very near the center of Accra and which exudes an offensive odor over the Ghanian capitol.

A Register of Toxic Chemicals in use in Ghana is being compiled, Professor Boateng said, and the EPC is monitoring trends in the levels of sulphur dioxide and particulate matter in three areas of Accra and Tema, the nearby industrial city. The Council also has prepared environmental syllabuses for use, in both formal and non-formal education.

EIRENE AMISSAH

Meetings ...

OCT. 1-3, Waterpower '79, The First International Symposium on Small Scale Hydropower and Its Potential, Washington, D.C., co-sponsored by the U.S. Army Corps of Engineers and the U.S. Department of Energy. Contact Waterpower '79, 1129 20th St., N.W., Suite 511, Washington, D.C. 20036; phone (202) 466-7290.

OCT. 1-5, First Regional NGOs Seminar on Asian Environment, Tokyo, sponsored by the Asian Environmental Society. Contact Dr. Desh Bandhu, Asian Environmental Society, 8, Darya Ganj, New Delhi 110002, India; phone 278764.

OCT. 22-NOV. 2, Workshop on Training for Natural Systems Management, Honolulu, sponspored by the East-West Environment and Policy Institute. Contact the East-West Center, 1777 East-West Rd., Honolulu, Hawaii 96848.

OCT. 23-25, Seminar on "New Ways to Save Energy," Brussels, sponsored by the Commission of the European Community. Contact Mr. P. Zegers, Commission of the European Communities, Directorate General XII C 1, rue de la Loi 200, 1049 Brussels, Belgium.

NOV. 26-30, World Conference on Sea Turtle Conservation, Washington, D.C., with private and government sponsorship. Contact Vivian Silverstein, 1244 19th St., N.W., Washington, D.C. 20036.

FEB. 11-15, 1980, Envited 80, (claimed to be the) World's Largest Environmental Technology Exposition & Congress, Dusseldorf, W. Germany. Contact: German-American Chamber of Commerce, 66 Fifth Ave., 21st floor, New York, N.Y. 10019; phone (212) 582-7788.

MARCH 24-26, 7th Energy Technology Conference & Exposition, Washington, D.C., sponsored by the private Government Institutes, Inc., is calling for papers (title, abstract and author's biography) by Sept. 10, 1979. Contact Lauren Unzelman, Energy Technology Conference, 4733 Bethesda Ave., N.W., Washington, D.C. 20014; phone (301) 656-1090.

JUNE 23-26, 3rd World Hydrogen Energy Conference, Tokyo, presented by International Association for Hydrogen Energy, is calling for abstracts for papers by Sept. 15, 1979 in English. Contact Dr. K. Fueki (for papers), or Dr. Tokio Ohta, Conference Chairman, 3rd WHEC Secretariat, c/o Japan Convention Services, Inc., Nippon Press Center Bldg., 2-2-1, Uchisaiwaicho, Chiyoda-ku, Tokyo 100, Japan; phone 03-508-1211.

In Asia . . .

INDONESIA has declared that for the next five years its environmental priorities are land, forest and water management, with special attention to the problems of human settlement.

This is one result of the prototypal environment coordination workshop held in Jakarta this past June (WER, June 18, p. 10). Environment Minister Emil Salim invited all development financing agencies working in Indonesia to incorporate environmental objectives in their projects and to exchange information with the government and each other on procedures and criteria for assessment.

Since then, Salim has announced the creation of a Coordinating Board for Environmental Management that will oversee policy and planning, regulation, training, education and research. It will be assisted by Indonesian agencies, organizations and universities.

FOREIGNERS—teachers, doctors, scientists, missionaries, research officers—have been responsible for smuggling Papua New Guinea's wildlife out of the country.

So Parliament has passed the International Trade (Fauna and Flora) Bill 1978 protecting its wildlife resources. Anyone caught smuggling the creatures could face six months' jail or a \$1,410 fine.

THE HONG KONG POLICE last year prosecuted 5,600 owners whose vehicles were emitting harmful exhaust fumes and almost 3,000 in the first half of this year.

The government is also considering the possibility of introducing noise limits for new vehicles.

There were 122 prosecutions for excessive noise from motor vehicles in 1978 and 15 so far this year.

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Executive Director • Dr. Whitman Bassow Editor • Libby Bassett Art • Peg High Circulation • Ann E. Claxton

The Center is a non-profit, non-advocacy, educational organization which seeks to foster public understanding of global environmental issues. Established in 1974 by the UN Association of the USA with the support of the UN Environment Program (UNEP), the Center alone is responsible for WER's contents.

South Korea is committed to building solar houses

SEOUL—South Korea will build 14,400 solar-powered houses between 1980 and 1983 as part of its efforts to develop solar energy as a substitute for conventional energy resources such as oil and coal. According to Ministry of Energy and Resources officials, the Ministry will construct 900 solar houses next year, 2,000 in 1981, 4,500 in 1982 and 7,000 in 1983.

The nation expects to save \$8 million worth of heating oil every year by building the solar houses.

Meanwhile, the government has decided to promote the construction of solar houses among the general public by making it mandatory to use insulating materials on all new buildings and excusing the real estate acquisition and registration taxes for those who build solar-energy houses. Also, those constructing solar-heated houses will be exempted from the obligation to buy housing bonds.

There will be a special housing loan, of up to \$80,000 for each solar-energy house, and additional financial assistance can be extended to those who build larger solar houses.

The government will also supply a total of \$3 million in loans within the year to the domestic producers of the mass, low-cost, long-life materials needed for solar houses.

SPECIAL TO WER

Australian-US miners, stopped by eco-laws, demand damages

PERTH—A sand mining company, stopped from exporting minerals because of environmental hazards to the island they were mining, is making a claim for \$23 million to the International Court of Justice.

The Australian government offered \$4 million in compensation, but DM Minerals, a 50/50 partnership between the American Dillingham Corporation and the local Murphyores, is taking the matter to the International Court in the Hague. The rutile and zircon mined represented 8 percent of world production at that time.

The claim is for losses incurred after a 1975 federal inquiry into sand mining on the world's largest sand island recommended deferring granting export licenses because of expected widespread environmental damage.

Earlier blanket approval to export for a year had been given provided special environmental considerations were met. But the Fraser Island Environmental Inquiry found there would be near-irreparable damage to the mined area and that rehabilitation could not be guaranteed. The island, off Queensland, is 122 kilometers long and a favorite tourist refuge.

The Cabinet backed the inquiry report and completely halted production on December 31, 1976.

The partners' case is backed by the US State Department and the Dillingham Corporation of Honolulu, said a spokesman for Murphyores.

JANE NACZYNSKI-PHILLIPS

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India must coax its Himalayan hill people into new farming methods or else millions of plains dwellers will face increasingly severe droughts and floods 3

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Toxic human milk may become a serious global problem



NAIROBI-In what could be an early warning of a serious problem on a global scale, the United Nations Environment Program's Earthwatch program has been receiving information that human milk in many parts of the world now contains significant levels of chlorinated hydrocarbons-such as DDT, aldrin and dieldrin, heptachlor, hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs).

UNEP's deputy executive director Peter S. Thacher told WER in Nairobi: "It has long been known that extensive use of DDT to control malaria-carrying mosquitoes can result in extremely high levels of it in human milk. But recent data on human milk composition collected by Earthwatch (UNEP's Global Environmental Monitoring Program) shows that developing countries have been receiving more than the internationally recognized safe levels of these substances.'

Thacher stressed that only a limited range of data is so far available and that a more comprehensive survey of the subject is still awaited. But some areas of Japan, the Netherlands, Sweden, Switzerland and the USA have shown one or more chlorinated hydrocarbons in human milk levels high enough to cause concern.

Describing the situation as "potentially disturbing," he said that, depending on the results of further surveys, it might be necessary to press for reductions in the use of certain chemicals. Alternatively, it might be concluded that the present "acceptable" levels for chlorinated hydrocarbons are too low.

It might also be advisable to recommend switching from breast to bottle feeding—this would be a serious step to take, but cows' milk does not contain chlorinated hydrocarbons. In many developing countries, bottle feeding raises even greater health risks for babies, however.

Thacher said chlorinated hydrocarbons find their way into the human system through the food chain and through other routes which are not fully understood. "A great deal more work needs to be done on the precise pathways," he said.

CHARLES HARRISON

Forestry ...

IN JUST ONE AREA OF VENEZUELA, more than 1.3 million hectares of trees have been destroyed in the last 25 years, reports the Association of Forest Engineers.

Portuguesa and Barinas States in the western plains have been subjected to exploitation which claims 50,000 hectares of forests every year through lumbering and burning, the association said. At this rate, by the year 2000 only 16 percent of that once-productive forested plain will be left.

The Forest Engineers estimate that local demand for forest products will triple by 1995 and even imports will not be able to supply the wood needed. They recommend the government unify authorities under a single forestry development body charged with forestry production, planting and research.

THAILAND'S FORESTED AREA has decreased to only 25 percent of the total land area. In 1963, the forested areas stood at about 51 percent.

MORE THAN 8,300 FOREST FIRES in Spain caused damage last year worth \$243 million. Over a million acres were burned, the Agriculture Ministry reported. The Ministry said the area affected by fires was seven times greater than in 1977.

A full 45 percent of the fires were reported started intentionally, against 16 percent through negligence and only 2 percent through natural causes. The origin of the remaining fires is still being investigated.

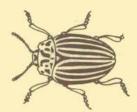
THE NORWEGIAN WOOD PROCESSING firm Borregaard is squeezing out more and more products from their timber because environment authorities told them they could dump only 9 percent of the 180,000 tons of sulphate lye they produce making cellulose.

So Borregaard has a new \$12.5 million evaporation-and-spray-dryer plant which transforms sulphate lye into unprocessed lignine sulphanates. A second plant will be added to increase annual production to 100,000 tons, making Borregaard one of the world's leading producers of lignine sulphanates.

Borregaard is already producing 25 processed lignine products which it sells to 20 different industries in 45 countries. Ninety-five percent of this production is exported.

Among the most important uses of ligninebased products are as a binder in animal feed, a binder in stabilizing oil drilling mud, in cement, pesticides, plaster building material, textile dyes and car batteries.

ANALYSIS:



Deforestation and our unknown endangered species, insects

NAIROBI—We hear a lot about endangered species. But lists of species under threat focus on the better-known categories, notably mammals and birds, and they deal only with those that are recognized as in trouble. Result: a few thousand life forms are officially declared threatened. What of the other categories of species, particularly the insects that are probably 400-800 times more numerous than all vertebrates (mammals, birds, fishes, reptiles and amphibians) put together? Of all insects that are believed to exist on earth, only one third to one-sixth (no one knows for sure) have been identified, let alone assessed for their survival prospects. If we could document their conservation status, we would almost certainly find that hundreds of thousands of species are threatened.

What is the evidence for this dismal diagnosis? Between 40 and 50 percent of earth's five to ten million species are thought to live in tropical rain forests, which cover 6 percent of the globe's land surface. This ecological zone is undergoing more rapid destruction than any other. Given present rates of exploitation (which are projected to accelerate), half of these forests may be eliminated by the end of the century, and the remainder is unlikely to survive much longer. Whole communities of species are finding their habitats chopped away from under their feet, and as many as one million species may be squeezed out of living space by the year 2000. Although the evidence is far from conclusive, it is not unrealistic to assume that we are losing one species a day right now, unheard of and apparently unregretted by the world's citizens and their leaders.

When a species disappears, it has gone for good; in many cases, that will be for bad. Every day, people around the world consume foods, take medicines and utilize industrial products that owe their origins to wild species of animals and plants. When we take a medical prescription to the pharmacy, there is one chance in two that the drug we receive has been derived from a wild species. Of 3000 plant species that have been found, on investigation, to possess potential anti-cancer properties, around half exist in tropical moist forests.

It is on these grounds that the U.S. National Cancer Institute believes that widespread deforestation in the tropics could cause a serious setback to finding treatments and cures for cancer.

In fact, there can hardly be a more valuable stock of natural resources on earth than the planetary spectrum of species. Yet the single largest repository of species, tropical rain forests, are being depleted more rapidly than the earth's petroleum stocks.

NORMAN MYERS







Himalayan farming methods cause drought and floods

BOMBAY—Year after year, India faces the paradox of dealing with acute droughts in summer, followed by severe flooding in the rains. The problem is located in the massive Indo-Gangetic plain, an ecological dependent of the Himalayan foothills, that straddle 1400 miles of northern India.

The floods were particularly severe last year—even Delhi, the capital, 200 miles away, wasn't spared—and experts are at last beginning to worry about tackling the massive deforestation of the Himalayas as a long-term solution instead of as an emergency measure each time there is a crisis.

Large tracts of forest land have been cleared to make way for cultivable land, though the region still imports three-quarters of its food needs from the plains anyway. Such subsistence farming is possible, even encouraged, thanks to a "money order economy" in which thousands of young hillmen migrate to work in the plains but despatch rupees home to enable the older folk to farm.

More than the cutting down of trees, however, it is the overgrazing of forests and grasslands by too many cattle and goats that is denuding the hills today. The local people breed these animals not for their milk (and certainly not for meat) but for plowing fields for just two months a year, or for their manure which is vital given the poor soil which erodes and doesn't retain water. Thus, in order to provide two or three months' of food for themselves, the Himalayan people are creating havoc with the entire Indo-Gangetic plain—India's granary.

With deforestation and over-grazing, the pattern of the Indian monsoon and the release of its waters for the rest of the year is threatened because these are controlled by soil conditions and the tree cover in the mountain belt.

Experts see the only permanent solution in coaxing hill people to stop using the plow and to turn to other means of livelihood.

Instead of foodgrains, the inhabitants should cultivate fruit, nuts, medicinal plants, castor oil, flowers and vegetables, these experts say. Once this is done, large areas will be freed for the development of forestry. In particular, ecologists believe that there should be complete afforestation of all lands above 4,000 feet, where the poorest families live. Every ridge and well-defined spur, now bare, will have to be reforested and any further extension of agriculture prohibited.

Rather than impose such practices by force, the administration will have to devise incentives for the people to switch from the plow to orchards and other forest-based livelihoods. Some community action, for instance, can be organized to provide for stall-feeding instead of free-grazing for animals, with the fodder provided by village or communal grasslands. Villagers can be encouraged to keep poultry instead of goats through loans from development agencies, and so on. While there is bound to be resistance to these changes, in the final analysis, the entire hill economy will be regenerated and the threat to millions of people in the plains below will be minimized, if not averted.

DARRYL D'MONTE

In Asia . . .

INDONESIA may have to import drinking water before the end of this century, Environment Minister Emil Salim said.

Salim said water usage is constantly increasing along with the country's rising population while its water conservation ability is decreasing. Moreover, forests, which are conserving agents, have been disappearing and large tracts of land, especially in Central Java have been bared of trees.

ALL RICE CULTIVATED IN SOUTH KOREA is contaminated with mercury. This was found in a recent survey by the South Korean National Institute of Health, the National Environment Research Institute and the Agricultural Technology Research Institute.

A similar survey by the Korea Atomic Energy Research Institute revealed that the average contamination of rice by mercury in the country is 0.053 parts per million.

Officials said the mercury contamination is not a serious matter compared to the permissible level of 1 ppm in Japan, and the

figures are decreasing annually.

CHINA recently held its first national meeting on air pollution control in Shengyang in Liaoning Province.

The need for reducing air-borne pollutants in 20 major Chinese industrial cities was emphasized at the conference.

THE WATER HYACINTH is regarded worldwide as a pest because it clogs rivers, lakes and harbors. However, Godfredo Monsod, who heads the Philippine Hyacinth Research and Development Corporation, after a five-year study has successfully turned the hyacinth into a source for industrial products. Monsod has been able to extract commercial products, such as animal feeds, wine and alcohol, pulp and textiles, food preservatives, candies, papers, acoustic boards, insulation boards, pesticides, medicine and deodorants.

The Philippine National Development Corporation (NDC) has already committed \$270 million for a commercial foodmeal plant that would utilize the water hyacinth.

Monsod's work has attracted the attention of other governments. The Indian government is offering him aid to put up an international research institute along the lines of the International Rice Research Institute, which is located in Laguna province.

Monsod began his work on the water hyacinth in 1972 when a great flood sent tons of water hyacinth overflowing the river banks of central Luzon.

In Latin America ...

SINCE THE COFFEE FREEZE in 1975, Brazil has been wracked by a continuing series of environmental crises precipitated by abnormal weather cycles.

Droughts, floods, even occasional freezes have alternately devastated Brazil's usually hardy, if not extremely efficient, agriculture

and killed thousands of cattle.

Traditionally an agricultural exporter, breaks in the weather cycles have left many Brazilian staple crops in short supply, requiring imports. Even black beans, the fundamental food of the country, had to be imported from Mexico last

The economy has suffered, and inflation is well above 40 percent annually as food supplies

diminish and the cost goes up.

Some environmentalists attribute the changing weather cycles to the wholesale destruction of forests and grasslands.

GUYANA is attempting to revive its charcoal industry as a possible source of alternative energy. In addition to supplying local needs, the Guvana Timber Board is understood to have identified overseas markets for 4500 tons of the

VENEZUELAN NATURALISTS, biologists and teachers have formed a nationwide Federation of Organizations and Environmental Groups. It will have a life of one hundred years dedicated to "the long and difficult struggle against pressures on the environment."

'Every city hall, the Ministry itself, will have to reckon with FORGA as an eternal watchdogor at least for the next 100 years," said Jose Mora, university professor. "We do not believe in the Ministry's honesty because they have not seen to the enforcement of the environmental

PERU'S state-run environmental office, CEPIS, has released a report claiming that Lima is one of the least polluted capitals in Latin America, although there are noxious substances in the atmosphere.

The report states that pollution in the Peruvian capital has been increasing, albeit gradually, due to greater industrial activity, an increased number of cars and a steady growth of the metropolitan population. Nevertheless, the air is cleaner than in Mexico City, Sao Paulo, Rosario, Montevideo, Buenos Aires and Rio de

Data for the report comes from Panamerican Network to sample air pollution which has over a score of stations throughout Latin America.

Brazilians will be consulted on developing Amazon region

RIO DE JANEIRO—The Brazilian government has announced a three-month study that will lead to a definitive program for the

development of the Amazon region.

As part of its political liberalization program, the militarydominated government called upon all sectors of the population to contribute to the formulation of the country's new policy for the jungle. Everyone will be heard and, it said, the conclusions of the study will be presented to Congress so they can legislate guidelines for the future development of all the activities in the

This move is a complete turnabout from previous government actions. Until now Amazon policy was pragmatic and varied, and occasionally even reversed in accordance with the whims of different governments. Also up till now, the people and even the experts were seldom consulted on Amazon policy decisions.

This arbitrary attitude climaxed last year when the press divulged that the government planned to divide the Amazon into huge squares to be bid on by foreign lumber companies. This stemmed from an interpretation of the first aerial photography of the area, that it contained billions of dollars of commercial timber. Brazil has a foreign debt of over \$40 billion and it was suggested that Amazon lumber could pay for the country's foreign debt. This story caused the greatest ecological reaction ever here, and the government soon announced it was only being considered. Now the lumber concession project and others are to GEORGE HAWRYLYSHYN get a public airing.

New grass species on poor land to spur Venezuela farm output

CARACAS—Expansion of agriculture in Venezuela to meet future food demands will have to be carried out on second-class and marginal lands through techniques not yet developed, according to an Environment Ministry survey. Conclusions drawn from a study of 61.75 million acres (25 million hectares) of land in the central plains point out the scarcity of good soils.

At present 113.6 million acres (46 million hectares) are considered suitable for agriculture: about one third of that for farming, and two thirds for stock raising-included in these figures are 12.3 million acres (5 million hectares) of parks, forest and water reserves.

In order to meet a demand for agricultural land of an estimated 193.5 million acres (78.3 million hectares) by the year 2000, Venezuela would have to introduce new grass species on the acid red soils of the central plains, where water is scarce half the year.

A vast module experiment is underway in the southern state of Apure, where the abundant rainwater is stored in reservoirs for irrigation during the 6 months of drought. LILI STEINHEIL

Peru's pioneering bagasse newsprint plant has troubles



LIMA—Peru has had difficulties producing newsprint from bagasse, the residue left after sugar has been extracted from cane. Other countries, interested in the process, are watching closely.

Sociedad Paramonga, the state paper-chemical complex, is building the first and so far only factory in the world to produce newsprint with bagasse as the principal ingredient.

The idea was conceived at the beginning of the decade when the price of imported wood-fiber newsprint began to soar. Sociedad Paramonga, an ex-W.R. Grace & Co. concern, had been producing every other kind of paper from bagasse successfully from as early as 1939. By 1976, construction on the \$120 million plant started. The advantage, according to Paramonga spokesmen, is that growing wood takes 15 to 20 years, while sugar cane takes only one and a half to two years. At the same time, the paper industry is utilizing a natural "wasted" resource; only a fractional amount of bagasse can be used by local sugar producers as fuel for their boilers.

Paramonga says they have had a "stream of foreign visitors." Egypt, Pakistan and Indonesia are all watching Peru's pioneering effort carefully while Argentina is already constructing a similar plant. Paramonga is sending technicians to Tucuman in Argentina to help start the project.

Tests on Peru's bagasse newsprint process began a year ago July, and so far only 12,000 metric tons of quality newsprint have been produced. Installed capacity is 110,000 metric tons a year. Most of the problems are related to the extra-sophisticated technology used in the Finnish paper machine plus a shortage of electricity in the area and what must be this year's most surprising anomaly in Peru, a scarcity of bagasse due to a prolonged drought last year in the north where sugar is produced.

LORETTA MCLAUGHLAN

Rio's mayor wants world's biggest oceanographic center

RIO DE JANEIRO—Rio's new mayor, Israel Klabin, has given top priority to the old idea of setting up an oceanographic center here. Klabin feels that as life in Rio is so much connected with the sea, the city should have nothing less than the largest oceanographic center in the world. The mayor is seeking ideas from abroad and has appointed a committee which has six months to come up with the plans for the center. GEORGE HAWRYLYSHYN

Recycling ...

SEVERAL HONG KONG COMPANIES are considering recycling oil. And the government, which is backing the move, may provide an oilywaste reception center.

According to a government official, the oil to be recycled includes lubricants and sludge from tankers.

CHINA'S SUCCESS in using bio-gas as an energy source has been studied by representatives from 18 developing countries, who took part in a half-month training seminar in China from July 26 to August 14.

Organized jointly by the United Nations Environment Program (UNEP) and the Government of China, the program included visits to biogas plants in the suburbs of big cities such as Beijing (Peking) and Shanghai, as well as to rural installations.

China has some 4.3 million bio-gas plants in operation. The province of Sichuan alone has trained about 100,000 people in the operation of these plants.

Seminar participants came from Bangladesh, Bolivia, Burundi, Cyprus, Egypt, Ethiopia, Guatemala, Grenada, India, Iraq, Papua New Guinea, Peru, Santo Domingo, Seychelles, Sri Lanka, Samoa, Thailand and Upper Volta.

BANGLADESH has set up a pilot bio-gas generation plant at Savar, 32 kilometers from Dacca.

The plant uses 150 kilograms of cattle wastes a day and can produce 300 cubic feet of methane gas—a quantity capable of meeting the daily fuel requirements of more than 30 people.

Prof. S.H.K. Eusufzai, chairman of the Environment Pollution Control Board, said that smaller models of the bio-gas generation plants would be produced for distribution among farmers to meet the energy needs of rural areas.

Traditionally firewood is the principle source of domestic fuel in the rural areas but large-scale deforestation has reduced wooded lands to 15 percent of the total land area. And thus the government attaches importance to biogas generation—to help conserve forests.

Environmental scientists are also considering the possibility of using human waste and kitchen refuse in generating bio-gas.

Earlier, Bangladesh and the United Nations Environment Program signed an agreement to jointly finance a \$1.35 million nation-wide scheme if the pilot bio-gas plant proved a success, which it has (WER, April 9, p. 6).

Water Quality ...

THEY LAUGHED when Saudi Arabia first suggested it, but now Professor Desmond C. Midgley of South Africa, an internationally known hydrologist, believes the best way to get water to the arid west coasts of South Africa and Namibia is icebergs brought up from Antarctica.

The nearest icebergs would be about 2,500 kilometers south of the Cape of Good Hope. He suggests they could be "towed or propelled."

"Studies indicate the idea is entirely feasible and economic," he stated in the SA Journal of Science in June. Fresh water in quantities ten times the content of South Africa's second largest dam (Vaal dam)—enough to satisfy the needs of Cape Town—can be found in one iceberg. Some are 10 kilometers in length. He says the idea is certainly more economical than desalination in terms of energy.

PORTUGAL'S PORT WINE INSTITUTE claims that the Spanish nuclear center under construction at Sayago will seriously affect port wine production. The center, situated only 12 kilometers from the Portuguese border on the River Douro, is expected to have multiple effects on the ecological system of the river by heating and perhaps radiating the water supply, affecting the port wine and olive oil crops at the river's edge and fishing within the river.

The institute has urged the Portuguese government to negotiate with the Spanish for installation of a refrigerator tower to minimize pollution of the area.

IMPROVED FLOOD FORECASTING and a warning system for Pakistan's Indus River Basin is a joint project between the Pakistani government and the World Meteorological Organization and United Nations Development Program.

A PROGRAM TO CUT DOWN POLLUTION of the Black Sea and Sea of Azov has been drawn up by Soviet Ukrainian scientists, Tass reports.

The Soviet news agency said the plan, developed by the All-Union Institute of Water Protection in Kharkhov, calls for stepped-up environmental measures on more than 20 rivers flowing into these seas from the Ukraine, the Russian Federation, Soviet Georgia and Moldavia.

Industrial water consumption will be reduced through compulsory installation of recycling systems at enterprises. Also, "special protective zones" involving water treatment plants will be established to fight pollution from pesticides and fertilizers used on croplands, Tass reported.



Arab politics holds up signing of Red Sea Convention

CAIRO—An ambitious multi-national effort to protect one of the world's most beautiful waterways, the Red Sea, is now in jeopardy.

Representatives of seven Arab nations need but one more meeting to put their initials to a draft convention that took nearly two years to prepare. It bans the dumping of pollutants into the Red Sea and the Gulf of Aden. But four of the seven countries—Saudi Arabia, Jordan, North Yemen and South Yemen—have severed all diplomatic ties with Egypt to protest its peace treaty with Israel. Of the seven, Egypt is on good terms with only Sudan and Somalia.

The agreement on the Red Sea was drafted by the Arab League's Educational, Scientific and Cultural Organization (ALESCO). Because of the peace treaty, league headquarters has been transferred from Cairo to Tunis, a move Egypt denounced as illegal. The Egyptians, therefore, won't go to Tunis and the Arabs won't come to Cairo. Under these circumstances, a meeting of the seven states to initial the convention and to tend to final drafting details is at present a remote possibility.

"The Red Sea is not actually polluted now," says a Cairo scientist. "Most of the countries that border it are not industrially developed. But when they are, it will be. There's no way out."

The agreement specifically bans the dumping of organohalogen and organosilicon compounds, mercury, cadmium, acids and alkalis from aluminum and titanium industries, plastic and synthetic materials (such as rope or netting) and oil.

One of the greatest threats to the Red Sea environment is the oil that spills out of tankers, shoreline refineries and drilling works. A scientist at Cairo's National Research Center estimates that along the Egyptian coastline alone 4,500 tons of oil a year are leaked into the Red Sea. Currents in the Red Sea tend to flow eastwards, carrying with them substances that are discharged from ships and leaving the Saudi coastline severely polluted.

The convention requires the parties to work in concert in the event of a massive oil spill and establishes a permanent Council for the Protection of the Marine Environment of the Red Sea and the Gulf of Aden. The council would monitor pollution levels, promote marine research and ensure implementation of the agreement.

Egyptian scientists say the proposed convention would at last commit Arab states to cooperative environmental planning—once they can cooperate politically.

NATHANIEL HARRISON

South Africa has developed a comprehensive oil spill plan

JOHANNESBURG—South Africa has the busiest coastline in the world when it comes to oil tankers—and potential oil spills.

Fifty-seven percent of West Europe's oil is routed round the Cape of Good Hope and that figure is expected to rise to 60 percent in the 1980s. Twenty percent of the United State's oil is routed via the Cape.

Last year the collision between two sister supertankers, the Venoil and the Venpet, off the southeast Cape caused consider-

able rethinking regarding pollution control.

The South African coast (3000 kilometers in length) is divided into two control areas—east and west. Overall control for pollution in either zone rests with the Secretary for Transport, and each zone has its own oil pollution action committee (OPAC), based at Durban and Cape Town. Similar committees to deal with localized pollution and contingency planning have been established at other ports. Willful polluters can be fined up to \$116,000. Close liaison is maintained between the Department and the South African Navy and Air Force. In an emergency, it can call for assistance from both.

Britain budgets million-plus for oil spill control

LONDON—Britain will spend £1.5 million (\$3 million) this year and next to tighten up its methods of dealing with oil spills and pollution. a further £.5 million will be spent annually as a recurrent cost.

The government's decision was based on a review of the Amoco Cadiz oilspill disaster that took place a year ago March. The four areas in which the Department of Trade will act are: command, control and communications; resources, research and development; salvage; and compensation.

Communications is stressed, both on land between the central and local authorities responsible, and in action between land, sea and airborne units. New VHF and other equipment is being installed in vessels.

A private umbrella group, the Advisory Committee on Oil Pollution of the Sea (ACOPS) criticized the government's plan to handle liability and compensation, saying it does not go far enough. ACOPS believes compensation should include even unidentified sources of pollution, which currently cause unfair costs to local authorities. It says also that the area of responsibility should extend beyond the three mile zone the government recommends and up to 12 miles, in accordance with Law of the Sea proposals. ACOPS also would like settlement of claims speeded up.

BARBARA MASSAM

Ocean Management...

OIL FROM THE RUNAWAY MEXICAN WELL should have hit the Texas coast by now, if U.S. scientists' mathematical models were correct. It took just over two months for the oil to travel nearly 1,000 kilometers, and the environmental consequences grow more serious every day the well remains uncapped.

The Mexican government began airlifting the baby Kemp's Ridley Sea Turtles from their hatching beach north of Tampico (WER, July 30, pp.1-2). The effect on the world's richest shrimp beds and other fish stocks is unknown.

Pemex, the state oil company, has asked the U.S. government for help in oil containment and cleanup operations at the wellhead, and the U.S. Coast Guard sent a national strike force team with equipment. Capt. Jose H. Orozco, Chief of the Naval Operations staff in Mexico City, said the target date for capping the well is Sept. 16th. But capping specialist Red Adair said it would be another two months before the well is closed down.

Just over the border in Texas, equipment has been set up around Port Isabel-Brownsville and more is available further along the coast in Corpus Christi. "Everything that can be done has been done," said a federal spokesman, "equipment, personnel, contingency plans. We just have to see which way the oil goes." It may go into bird sanctuaries and tourism centers.

AFTER A "MAJOR OIL SPILL" in Panama, Costa Rican officials sent scientists across their mutual border to investigate it and the oil transshipment terminal at Puerto Armuelles. The spill was minor, the terminal modern, and the oil had disappeared. Nevertheless, the Costa Rican group came up with recommendations in case a major spill actually does occur just across the border in Panama.

They suggested that: (1) a communications network be established between Panamanian and Costa Rican port authorities, (2) observation posts at strategic points along the coastlines be created, (3) legislation be enacted placing legal responsibility for ecological damage where it properly belongs, (4) studies and charts be made of the sea currents off both coastlines of Costa Rica, (5) a review be made of all existing local facilities for the unloading and loading of fuels and other potentially dangerous liquids. And the group strongly recommended the creation of a National Environmental Protection Commission to deal with all related problems.

Renewable Energy...

SOUTH KOREA wants 9 percent of the nation's total energy demand met by solar energy over a long-term basis.

Incentives to be introduced include five-year tax holidays for those who build solar energy houses and exemption from the obligation to buy housing bonds. Special housing funds will also be set up.

The government had announced a plan last year under which solar energy development projects will be undertaken in four steps between 1978 and 2000, and presently prototype solar houses are constructed at Changan-dong in the southeastern outskirts of Seoul. More solar houses will be constructed in Pusan, Taegu and Taejon next year.

THE PHILIPPINES is setting up 12 stations nationwide to monitor solar radiation and wind velocity. The data gathered will serve as the basis for developing non-conventional energy sources.

CHINA'S FIRST SOLAR-HEATED BUILDING will soon be completed at Hsining, capital of Chinghai Province on the northern slopes of the Tibetan plateau.

According to the New China News Agency, one-fifth of the five-story building will be heated by solar energy collected by panels on the roof. Up till now, China had developed only small solar energy collection panels and storage devices, used to heat water.

THE MODEL OF A WAVE-POWER electric station has been developed by experts from the Romanian Institute of Hydro-Power Research and Design, assisted by researchers from the Marine Research Institute of Constanta.

According to the Romanian wire service Agerpress, in spite of the low energy potential of coastal waves, it is estimated that the Black Sea can supply 40,000 kilowatt hours per year for each meter of wave line.

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As French solar lobby gains, money for R&D does not

PARIS—France has just celebrated a sun month, modeled on last year's Sun Day in the U.S. Its organizers—scientists, ecologists and solar equipment companies—say that a solar lobby has taken shape here. Even so, France is losing ground to the U.S. in the race to be solar industry leader because it is not getting comparable research money.

The French government is firmly committed to nuclear power and looks askance at solar supporters who want further investment in alternatives. But in a political move, the Giscard government just agreed to an 11th hour reprieve of the country's biggest solar experiment—a solar-powered tower at Targassonne in sunny southern France. Scheduled for extinction because of cost overruns, the project was revived in a \$40 million scaled-down version—2.5 megawatts, enough for a small town. (In California, a U.S. utility is building a 10 megawatt facility using the same system of heliostats to make steam in a tower and drive an electricity-producing turbine.)

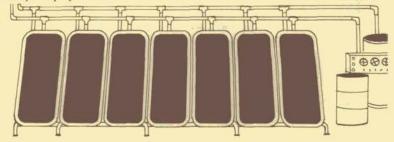
Many French scientists would have preferred government investment in smaller solar components, notably photovoltaics. But the centralized French government and the powerful power monopoly, E.D.F., seem to prefer big projects requiring massive and expensive technology. Despite the success of sun month, the French government shows no signs of unblocking extra funds.

France's goal is to cover 5 percent of its energy needs with solar power by 2000. French companies, still Europe's leaders in solar energy, have had to turn to the U.S. for help in a series of recent joint ventures. Solarex and the French firm Leroy Sommers (solar pumps for African desert wells) have formed France-Photon. The largest French commercial group, CGE, and a major French electronics firm, Sensor Technology and Thomseon, have started a joint venture with Solar Power (the Exxon solar subsidiary). Motorola has opened a factory in Toulouse.

The French companies think the U.S. is gaining an unbeatable lead. "French scientists held their own when the research budget ratio was only 5 to 1 against them," a U.S. science attache says. "But now it's \$560 million a year versus just over \$20 million a year. France is bound to slip behind."

A French solar power executive said, "Our industry is becoming dependent on U.S. technology, and we're giving the U.S. firms a French visiting card to help them export to African and Middle East markets. But we have no choice, France is in effect suppressing any meaningful research effort in the areas which are likely to pay off."

AIDA ATTALLAH



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In This Issue ...

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Mexico's runaway oil well is a continuing ecological disaster

MEXICO CITY—What may become the worst oil spill in history is spreading a streaky slick of oil more than 200 miles west and north of the well that blew out June 3rd and has been unstoppable ever since.

Just how much oil is escaping is in question. Estimates range from 10,000 barrels a day to the 30,000 barrels a day claimed by Petroleos Mexicanos (Pemex), the state-owned oil company. Pemex says most of the spill is burning off at the site. Other experts say it's a gas fire; the oil is being emulsified in water. Whatever the amount (and the experts' consensus is that 15,000-25,000 barrels are escaping daily), the ecological effects cannot be tallied yet.

But some dangers are clear: The Bay of Campeche, where Ixtoc-1 blew, has the world's richest shrimp beds—a \$100 million industry. If the Yucatan Peninsula is the thumb of Mexico, Ixtoc-1 off Ciudad del Carmen is right at the curve where thumb and hand meet. The slick is moving west and north towards the hand part of Mexico. Luckily most shrimp beds and the fisheries along the Campeche Banks are in the opposite direction. Still, this is the time of year when shrimp larvae float to the surface; if they hit oil, it may ruin shrimping for many years to come. On July 2nd, the government decreed a ban against fishing off Campeche and Yucatan states.

The Instituto Nacional de Pesca and the U.S. Fish and Wildlife Service are making plans to evacuate the most endangered of all sea turtles, the Kemp's Ridley Sea Turtle, by helicopter if necessary. The turtles are nesting now on the beach at Rancho Nuevo, about 85 kilometers north of Tampico. Less than 1,000 adult females of this species are left, and their 100,000 nestlings have been hatching since mid-June. If the oil slick has traveled to Tampico by mid-August when the last turtles hatch, it will endanger them on their long journey across the Gulf of Mexico as far as Florida's west coast. (Under the best circumstances, more than 90 percent die.) If the slick interferes, they will be flown over it to feeding grounds in the Gulf. Right now there is no danger as the slick is about 350 kilometers southeast of the nesting site.

On June 29th, three weeks after Ixtoc-1 blew, Mexico created a committee of government officials and academics to study the ecological consequences of the accident. Although the U.S.

Ocean Management...

A MORATORIUM on oil exploration on Australia's Great Barrier Reef has been continued. The Prime Minister, Malcolm Fraser, announced the decision after the state of Queensland recently began making moves to have the almost-decade-long moratorium lifted (WER, May 21, p.6). Prime Minister Fraser said no oil exploration permits will be renewed until more extensive research results on the environmental effects are in.

Queensland, which ostensibly has control over the Reef, has been placated by an agreement with the federal government which establishes a joint council to coordinate policies on the to-be-established Great Barrier Reef Marine Park.

THE THAI NATIONAL ENVIRONMENT Board and the Harbor Department recently organized a three-day seminar on the state of Thailand's marine environment and the effective use of technology for combating and controlling marine pollution in the country.

Experts from Thailand, the United Nations, France and Sweden discussed ways to ensure that exploitation of the marine environment is accompanied by efforts to protect it from pollution.

Bangladesh, Brunei, India, Indonesia, Malaysia, Pakistan, the Philippines, Singapore, Sri Lanka, Vietnam and Thailand have all participated in marine environment protection projects which involve the assessment and appraisal of national needs for pollution control equipment and training and the possibility of establishing a regional training center for personnel involved in controlling marine pollution.

THE MALAYSIAN government will set up three operational centers to control oil spills in the Straits of Malacca—at Penang, Port Klang and Johore.

The Straits of Malacca has become one of the dirtiest sealanes in the world. Science, Technology and Environment Minister Tan Sriu Ong Kee Hui said about 57 percent of the beaches on the east coast from Kota Baru to Mersing has been contaminated by oil residue.

FIREHOSES were turned on members of the environmental protest group Greenpeace when they attempted to prevent the dumping of low-level radioactive waste by the United Kingdom Atomic Energy Authority in the Atlantic 600 miles southwest of Land's End, Cornwall.

In the past, Greenpeace has sailed the "Rainbow Warrior" to prevent seal slaughter and protect sperm whales.

government has a federal command post set up specifically to monitor this spill and its potential threat, it has not been asked by the Mexican government for help. Many observers believe this is a result of the historic distrust, often deserved, that Mexico has for the U.S.

A number of U.S. experts and entrepreneurs have offered their services to Pemex and the Mexican government. Red Adair, the most successful international oil well firefighter, and his crew from Houston, Texas, failed to close the jammed underwater blowout valves. Mexican and American crews are still diving, trying to cap the fantastic pressure. Meanwhile, the first of two 3500-meter-deep relief wells has reached the half-way point. Once it is drilled, they have to bridge through to lxtoc-1 to relieve the pressure so it can be capped. It may not work, hence the second relief well just getting underway.

Many sources said the Mexican government has been hampered in picking the best people for the job by lack of experience and an unwieldy and conflicting bureaucracy. Many Americans are not used to working with a developing country; the Mexicans have an understandable national pride that is suffering some damage. One top oil spill consultant sympathized but said, "It's necessary to recognize the point at which you should bend national pride because of the magnitude of the problem. Trying to deal with it yourself is foolhardy." And, he warned, erroneous data will hamper other countries as they try to develop their own contingency plans for oil spills.

A number of organizations are trying to help clean up the spill. Oil Mop Inc. has five of its oil adsorbent mop machines working off a barge retrieving between 1,000 and 4,000 barrels of approximately 40 percent oil emulsion daily. Norwegians, Californians and others have tried skimmers with minor or no success. And, as of mid-July, more than 175,000 gallons of COREXIT, an oil dispersant made by Exxon, had been scattered aerially. Although COREXIT is considered probably the least toxic of all dispersants, some private observers claimed it could be dangerous to fish and shellfish breeding areas. Nobody knows its effects on sea life, said Pemex chief of environmental control, Miguel Angel Garcia Lara, because there is no antecedent for the effect of oil on a tropical sea.

More than six weeks after the spill, there was still uncertainty over which way it would move. The Americans had three conflicting computer models of currents in the Bay of Campeche-Gulf of Mexico. In mid-July they got permission from Mexico to track the spill with a plane that has infrared, ultraviolet, microwave and side-looking radar. At the same time, a team of U.S. scientists spent several days in a Coast Guard cutter plotting currents to find out which way the slick will go.

It could get a lot bigger, since Ixtoc-1 may not be stopped for several weeks. As for now, no one can predict the magnitude of its destruction. But if there is an average rate of spill of 20,000 barrels a day, then sometime next week Ixtoc-1 becomes the worst oilspill in history, leaving the "Amoco Cadiz" (1.3 million barrels) way behind

Written from information supplied by: Katherine Hatch, Mexico; The Center for Short-Lived Phenomena, Cambridge, Mass.; U.S. Environmental Protection Agency, Washington, D.C.; Federal On-Scene Coordinator Command Post, Corpus Christi, Texas; and Private Consultants.

Mediterranean nations agree to control land-based pollutants

GENEVA—Agreement has been reached to control the most serious kinds of pollution—land-based pollutants—that threaten the health of the Mediterranean, its people and its 100 million tourists every year.

Recently, experts from most of the 18 Mediterranean governments and the European Community came to a broad agreement on the text of a future treaty controlling pollution from factory waste, municipal sewage, and agricultural pesticides and fertilizers.

"The agreement on this key treaty came as an agreeable surprise," said Tunisia's Ambassador Ridha Bach Baouab. He was optimistic the treaty would be signed at a conference in Athens next spring.

Over the past two-and-a-half years the United Nations Environment Program has organized three major meetings to prepare for this treaty. UNEP's Deputy Executive Director Peter S. Thacher explained, "The complexity of the problems of urban, industrial and agricultural pollution, the high cost of diminishing and controlling it, have understandably resulted in long and often difficult negotiations. But this meeting has been a real breakthrough."

UNEP estimates that about 80 percent of all municipal sewage now enters the Mediterranean untreated or inadequately treated. Once the treaty is signed, the 18 nations would agree to create common standards, but the time table for their application would

vary from one pollutant to the other.

There is a black list of pollutants which, because of their toxicity, persistence and bio-accumulation, ought not to enter the Mediterranean at all. They include mercury, cadmium, used lubricating oils, phosphorus, persistent synthetics which may float, sink or remain in suspension, carcinogenic or mutagenic substances, and radioactive substances.

A gray list of less noxious substances may be authorized since they are more readily rendered harmless by natural processes. They might include zinc, copper, lead, titanium, arsenic, silver, cobalt, tin, crude oils and hydrocarbons, pathogenic microorganisms, non-biodegradable detergents, and substances that affect the taste or smell of fish and shellfish.

Signers bind themselves to exchange information on the authorizations they grant, on pollution monitoring data and on the quantities of pollutants they discharge. SPECIAL TO WER



Water wise ...

NEARLY \$5 MILLION in subsidies has just been distributed by Sweden's National Environment Protection Agency (NEPA) to cover half the cost of the nation's communal sewage treatment plants. Over the last decade NEPA has shared out over \$395 million (1.7 billion Crowns) among communities for purification plants in an expansion which now handles practically all sewage.

ONLY ONE IN 20 INDIANS has sewerage facilities and only half the human waste generated by this tiny fraction of the population is treated before it is discharged into rivers and the ocean.

B.V. Rotkar, secretary of the Central Board for the Prevention of Water Pollution, has called for massive help from state governments as well as from the central government in Delhi to provide for better sewerage treatment facilities, especially in urban India—200 million people who live in towns or cities with populations exceeding 100,000.

THERMAL EFFLUENT from two power plants in South Korea is damaging fish and plankton, according to a report released by the Korean Ocean Research and Development Institute.

About 40-60 percent of plankton and 60 percent of the small fish and larvae living in seas near the Kori Nuclear Power Plant and the Yosu Thermal Power Plant have been killed.

Although the study shows that the impact of heated effluents from both power plants are not significantly affecting the distributional patterns of aquatic organisms in studied areas, the expected two dozen power plants in 1990 will certainly affect coastal ecosystems and mariculture as 2,000 tons of water will be used by the plants every day.

IN MALAYSIA, large amounts of agricultural waste products flow untreated into the river systems despite the existence of the Environment Quality Act (1974). According to an official of the Department of Environment (DOE), farmers are hesitant to adopt waste-recycling methods because of the expense involved in installing recycling equipment.

In addition, palm oil is destroying many rivers. The Environmental Protection Society of Malaysia (EPSM) estimates that three to four million tons of effluents are discharged annually by 86 palm oil factories. The effluents carry both solids and oil which absorb oxygen from the rivers.

The DOE said that of nearly 3.7 million tons of municipal waste collected every year, 55 percent was treated by open burning—total emissions: about 30,000 tons of particulate matter and 25,800 tons of acid gases.

Environmental Management...



THE INTERNATIONAL WHALING COMMISSION, which met in London this month, took a significant step toward conservation when it agreed to an indefinite moratorium on whaling from factory ships. A parallel proposal, a moratorium on whaling from land stations, just missed getting a three-quarters majority and was not adopted.

In addition, at the Seychelles' suggestion, the IWC decided to establish a whale sanctuary in the Indian Ocean.

Implementation of the factory ship moratorium, which covers all whaling except for the small Minke whale, must be taken within 90 days after the meeting to become binding. However, a state can object and say it will not be bound by the vote; then there is an extensive period in which other states can reconsider. A U.S. State Department participant said objections are not made lightly and, although the Soviet Union and Japan did not support the moratorium, no one can predict whether they will formally object.

SPAIN'S NEWLY ELECTED city councilors are about to get a Municipal Environment Guide designed to let them know exactly what legal powers they have to clean up their own patches of land, sea and air—one of the duties of city hall that received little, if any, attention in the Franco days.

"There are many things people don't know, many laws that are not applied," says environmental boss Daniel de Linos, the first man to occupy the new government job. "We can go a long way by solving little problems."

THE AFRICAN REMOTE SENSING Council is now legally established, designed to expedite the exploration of Africa's natural resources and to monitor environmental changes that would result from the exploitation of those natural resources.

Ten African states have now signed the Council's constitution, bringing it into existence after four years of planning and preparation under the U.N. Economic Commission for Africa (ECA).

ECA is now to convene the first meeting of Council members to discuss an African remote sensing program. Africa does not plan to have its own satellites but aims to cooperate in using existing equipment.

The U.S. and Soviets propose banning radiological weapons

GENEVA—The United States and the Soviet Union—after two years of bilateral negotiations—joined July 10th in proposing an international treaty to ban a new weapon that would use radioactive material to kill and destroy.

The proposal to outlaw radiological weapons was made to the 33-nation Geneva Disarmament Conference for debate and possible changes.

As far as is known, no nation has yet developed radiological weapons. These are commonly defined as ones that would scatter radioactive material over an area without producing a nuclear explosion. The radiation produced by the decaying matter would destroy people and property over a wide area for a long time.

The environmental implications are immense—for preparation and testing as well as for use.

The joint draft treaty proposes that the regulation be of unlimited duration and that any nation suspecting another of cheating could complain to the United Nations Security Council.

WILLIAM G. MAHONEY

Industry opposes Sweden's central chemical register

STOCKHOLM—Sweden's pioneering project for an allembracing central register of chemical products, domestic and imported, has run into a snag. Industry has objected to disclosing certain detailed information for competitive reasons.

As a consequence of the strong industrial pressure, the Products Control Division of Sweden's National Environment Protection Agency (NEPA) has watered down its original demands.

Thure Svensson, who heads the project, expressed his disappointment in NEPA's monthly journal, but said nevertheless the compromise was "a step forward". He predicted that for an "acceptable" register it still would be necessary to demand further information in detail from industry.

In addition to products, chemicals and compounds would also be listed, their amounts and the uses to which they could be put, all to be incorporated into a central data bank where information could be quickly retrieved whenever suspicions or questions arose about dangers to health and the environment. The register, in short, was to lay the groundwork for effective control of all chemical products.

The first stage of the project has been completed—the listing of approximately 100,000 products from 2,400 companies, more than twice the number expected (WER Jan. 2, 1978, p.4).

But the so-called declaration stage, the very heart of the ambitious project, began building opposition because the

composition of chemical products was to be supplied.

"The reason, above all, is the question of secrecy," said Erik Brandt, director of the chemical bureau. "Industry considers Sweden's law on secrecy too weak to protect manufacturers against confidential information about the exact composition of chemical products reaching competitors. Foreign firms have declared that they would rather give up the Swedish market than risk their manufacturing secrets through a far too detailed register."

But Svensson wrote in NEPA's journal, "Industry is exaggerating. The secrecy question is just a pretext. Above all, the aversion of foreign multi-national companies toward a good Swedish register undoubtedly is due to fear of its snowballing effects."

He predicted that the Swedish example will be followed in other countries. Switzerland already has a short register of some 45,000 products, he said, which is to be put in a data bank this year. In Norway, preparations are well advanced and Denmark is investigating the possibility.

SPECIAL TO WER

Spain will enact new Law of Environmental Protection

MADRID—The Spanish government will present to parliament in December a Law of Environmental Protection that represents the most comprehensive attempt ever undertaken in Spain to lay down guidelines and laws for the neglected environment.

The law is not without its critics. Says one environmentalist in the Spanish administration: "A lot of us think the priorities are wrong. There are a lot of things that need doing—and could have been done—immediately to improve the situation without dedicating so much time and attention to a general law. One obvious thing would have been to impose stiffer fines on polluters."

The two most complete sections of the proposed environmental law, which is still in the early stages of drafting, are a Law for the Protection of Nature and a Water Law to replace 100-year-old legislation currently governing rivers and waterways. The fines applicable under these ancient laws seldom pass the \$300 mark and too often are viewed by industry as a cheap alternative to clean-up programs.

"The situation is serious in some stretches of water, at some coastal points and in urban tourist centers which dump directly in the sea," says Spain's director general of the environment, Daniel de Linos.

Another government official, Alfonso Ensenat, subdirector general of the industrial environment, puts it more dramatically: "Spain will be a country dying of thirst in the year 2070 if we continue the present rhythm of fluvial contamination, or even a more moderate rhythm. Fines resolve nothing as they become a tax on pollution which seems to consecrate the right to pollute."

Environmental Legislation...

SWEDEN'S PARLIAMENT, reacting to the Harrisburg nuclear accident in the United States, has put the issue of nuclear power development into a temporary freeze.

Leaders of the five parliamentary parties decided to put the whole business, which cost the Social Democrats an election victory and bought down the successor government, to the nation in a referendum next March.

Instead of acting on a bill laying down Sweden's energy policy for the next decade, Parliament passed a so-called "breathing space" law banning activation of any further reactors until after July, 1980. By then, the results of the referendum will be known and a study completed by a special government commission on steps needed to secure the safety of Swedish reactors.

THE PERUVIAN GOVERNMENT has taken an initial legal step towards combating mismanagement of toxic chemicals by fumigators and exterminators. The department of environmental health says that the law is the first of its kind and that a series of complementary laws are expected to be passed in the future.

Under the new legislation, companies which use insecticides and disinfectants like DDT and cyanogen have to fulfil legal requirements concerning personnel, equipment and techniques.

All companies will have to register with the environmental health department of the ministry of health. Storage facilities and techniques and equipment will have to be approved by the department. All work except regular tank cleaning has to be approved by the authorities.

PRESIDENT JOAO BAPTISTA FIGUEIREDO of Brazil signed decrees recently creating Pico da Neblina National Park in the Amazon, Serra do Capivara National Park in Piaui and a marine biological reserve Atol das Rocas, off Rio Grande do Norte at a ceremony at the Brazilian Institute of Forest Development headquarters (IBDF) in Brasilia.

"The forest destroyed by our predecessors," said IBDF president Carlos Neves Galluf at the ceremony, "especially in the Amazon, is now being reenforced as a biomass reserve (the parks), which can be transformed into an alternate form of energy that the country needs."

In Africa ...

IN SPITE OF A DECLINE in national fertility, 2,000 babies are born daily in South Africa. The Family Planning Association says water demand will exceed supply just after the turn of the century.

Water is the country's one really scarce resource. There is only one major river, the 2000-kilometer Orange, which within living memory has dried up (1933).

Water recycling is now a priority but with friendlier relationships with her northern neighbors, South Africa hopes one day to pipe from the Zambesi which flows 1600 kilometers to the north between Zimbabwe Rhodesia and Zambia.

FAMILY PLANNING teams in Zimbabwe Rhodesia are at last scoring successes.

Even though the guerrilla war has cut bush medical services to a minimum, contraception at last is being accepted, and male contraception is up by 300 percent over last year, with clinic visits significantly increased.

The director of the Family Planning Association, Peter Dodds, said this success depended on teams of family planning staff circulating among the kraals (settlements), providing a continuing effort at education.

The estimated population of the country when the white man first settled in 1890 was less than 600,000. Now it has reached 7 million and will double by the end of this century. Half of the black population is under 16 years old.

ZIMBABWE RHODESIA, which gets all its oil through South Africa (itself threatened with international sanctions), is learning to produce increasing quantities of oil from agriculture—particularly maize, sunflower and sugar—to supplement imports. And the country's considerable coal reserves are also being put to use producing oil.

PRECIPITATING COAL ASH to abate air pollution is fine—but then the ash dumps become a pollution problem. Now South Africa is using fly ash as an additive to cement and as a soil stabilizer in road construction.

AN AFRICAN SOLAR ENERGY conference was held in Cairo starting July 29th. Delegates from 14 African nations were expected to join with more than 100 Egyptian scientists at the conference, planned to promote economic development by using solar energy in water desalination for agriculture.

The conference is being held at Cairo's Academy of Scientific Research and Technology.



Shantytowns strain Morocco's water and sewer systems

RABAT—Like most developing countries Morocco's main environmental problem is poverty—here it is the unhealthy shanty towns around all the main cities. They represent a health threat not only to their inhabitants but to the cities themselves, said Abbes Al-Fassy, Minister of Housing and Territorial Development. His department was set up in 1972 as the Ministry of Environment but has since had a name change because it is more appropriate to local conditions.

Most shanty towns have inadequate water supplies, and sewerage systems are practically non-existent. The Douar Doum settlement outside Rabat is typical; it is located next to the city dump which is on the banks of the river, a combination that pollutes a wide area. Because the wind frequently wafts from Douar Doum to a quarter inhabited by Morocco's elite, the shantytown is to be razed and replaced by a modern housing project financed by a World Bank loan. But the shantytown problem elsewhere is likely to remain. Morocco is badly strapped for cash, and Mr. Al-Fassy admits that the country's environmental policies are still embryonic.

With a total population near 20 million and two cities of over a million (Casablanca and Rabat-Sale), Morocco still has no sewage treatment plants. A plant to process trash in Rabat and convert it into fertilizer began operations almost ten yers ago but it made such a stench it had to be closed down. (It was built opposite Embassy Row.) Farmers were reluctant to use the plant's product because of the suffocating odor of ammoniac.

This year Japan offered to train Moroccans in trash disposal techniques and several have already been to Tokyo. For the moment the question of treating sewage is shelved although the Sebou, Morocco's biggest river, receives untreated sewer water from three big cities (Fez, Meknes and Kenitra) and industrial effluent from several textile and paper mills when the river is supposed to be used for irrigation.

Mr. Al-Fassy has set up a National Environment Committee which will offer an annual prize to reward environment protection achievements. Its purpose is to alert the population to potential problems. "Friends of the Environment" groups are to be set up and studies made to draft legislation.

First among the new laws will be one on maritime pollution as the country's Atlantic and Mediterranean littorals are constantly threatened by oil tankers on very busy sealanes.

STEPHEN O. HUGHES

Taiwan testing the effects of pesticides on the environment

TAIPEI—Taiwan has been chosen as the location for a two-year project to test the effects of pesticides on the environment, a project expected to have worldwide applications.

The program was decided on this spring at a joint Taiwan-U.S. seminar on pesticide usage in intensive agricultural systems, and some tests will be conducted simultaneously with similar ones at U.S. university farms for the sake of comparison. The project has already begun.

Taiwan was chosen for several reasons. First, the island's farmers are among the biggest pesticide users in the world. Applications on paddy fields are 3.1 kilograms of active ingredients per hectare a year, twice to five times the level on corn and soybean crops in the U.S. A total of 371 types of pesticide are in use in Taiwan.

Second, an advanced testing system is already in place on the island, including 21 field stations and laboratories. And third, agricultural activities are highly intensive, with two or even three rice crops being harvested a year, often rotated with other vegetable crops. The wet, warm climate is a microcosm of conditions found in most tropical and sub-tropical countries all over the world.

A senior specialist in the plant industry division of the Council for Agricultural Planning and Development, T.Y. Ku, who will supervise the program, explained that the effects of pesticides on the environment are only fully known in the case of primary nontarget organisms such as birds and fish. The effects on other organisms, such as insects, arthropods, bacteria, amphibians and molluscs, many themselves pest predators, are only partially known. Information is also lacking on the effect on perhaps the most important organism of all—man.

Tests on humans will include blood samples taken from farmers working in flooded rice fields.

All these findings will be backed by extensive investigations into the exact amounts and types of pesticides used by farmers and the timing of applications, to find out which particular "cocktail" is best for maximum reduction of pests and minimum damage to the environment.

Dr. Ku pointed out that Taiwan abandoned the use of pesticides such as DDT, heavy metal compounds and organochlorates in 1974, and now only uses short-life pesticides. Farmers are also advised on timing of applications, and spot tests carried out on food and water supplies show that pesticide levels are not high.

Despite the high use of pesticides on agricultural land, the residue is one of the lowest in the world. This is believed caused by the island's heavy rainfall, high mountains, small area and abundant sunshine, which ensure a fast run-off and evaporation. Finding the exact reasons will also be one of the targets of the program.

MICHAEL W. BOYDELL

In Asia . . .

INVESTIGATIONS of pollution-causing enterprises conducted by the South Korean Ministry of Health and Social Affairs were scheduled to

begin again this July.

The Ministry found 1,309 enterprises neglecting anti-pollution responsibilities during the first quarter of this year. Of them, 152 lost their licenses and 155 were ordered to move to other areas. Eighty-four were ordered to suspend business temporarily, 844 enterprises were instructed to improve their facilities and 44 prosecuted.

THE SINGAPORE MANUFACTURERS' Association (SMA) is introducing a waste exchange scheme to help manufacturers recycle waste products and pass them onto others who could use them as raw materials.

The scheme has already been serving industries including metal, mechanical and engineering and will be extended to other industries if proved successful. The SMA waste exchange collects information only and is the first of its kind in Southeast Asia.

MALAYSIA'S RUBBER RESEARCH Institute (RRI) claims it has developed a very economical "oxidation pond system" for pollution control in rubber factories. The system will cost anywhere from \$23,000 to \$114,000 for each factory, depending on its size.

The system uses a natural biological process where oxygen for oxidation is supplied by algae through photosynthesis, and bacteria in the effluent bring about the oxidation process.

Meanwhile, checks on pollution caused by rubber processing factories in Malaysia will be carried out twice yearly by the Ministry of Science, Technology and Environment. A spokesman for the Ministry's Division of Water Pollution Control said that the factories were also required to submit quarterly reports giving analytical data on effluents.

BIOGAS AS FUEL is gaining acceptance among industrial and household users in the Philippines.

According to a Ministry of Energy report, biogas plants grew from less than 100 units to 344 units last year. Two-thirds were installed in private farms and households while the rest were set up by the government for demonstration to the public.

Four out of five units were constructed at a

cost of only \$812 (6,000 pesos).

Biogas is produced from waste materials, including animal manure, waste vegetables, fruit peelings and garbage. The garbage and farm wastes are transformed into methane gas which can be used to run heating, refrigeration and cooking equipment.

New Fuels . . .

AUSTRALIA'S LARGEST OIL SHALE deposit, the Rundle deposit in Queensland, will begin first-stage construction and mining next year in a project that could ultimately meet 25 percent of the country's day-to-day oil needs by 1990.

The shale-to-oil conversion process will initially cost \$280 million for the two companies developing the 11-kilometer-long deposit. Central Pacific Minerals and Southern Pacific Petroleum will begin production in 1982 of 20,000 barrels of shale oil, naptha and gas daily; eventually it will be 250,000 barrels a day.

A BULGARIAN MECHANIC has invented a car that runs on four types of fuel—gasoline, propane-butane gas, gasoline and water mixture and a propane-butane-and water mixture.

The Bulgarian news agency BTA reported that 33-year-old mechanic Nikola Stefanov, who lives in the Danube River town of Silistra, designed his new fuel system with the help of his father and utilized a gasoline-water fuel mixture developed by his former technical school teacher.

It said that he designed the system two years ago and installed it in a Soviet-made Moskvich 412 car. The dashboard has four extra push buttons so the driver can select the fuel he wishes.

A CAR THAT RUNS ON ALGAE FUEL would make isolated Australia's all-encompassing coastline an ideal energy farm. The Commonwealth of Scientific and Industrial Research Organization's Division of Chemical Technology believes that in a mere five years this could be the most attractive of the continent's fuel alternatives. Plant materials could provide up to 60 percent of the (currently) 15 million tons of motor fuels used each year in Australia.

CSIRO scientist Dr. Cyril Curtain said the fuels could be made by refining naturally-occurring oils in marine plants, or by fermenting the plants to make methane gas or ketones.

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New Zealanders must go carless one day a week to save gas

WELLINGTON—New Zealanders have lost the use of their cars one day a week. Prime Minister Robert Muldoon announced the new fuel-saving scheme three weeks after New Zealand banned weekend gasoline sales and increased the price of fuel 20 percent to 36 cents a liter.

The scheme, which was to begin July 30, works like this: Motorists must attach a colored sticker to their windshields. The color denotes the day on which the motorist has chosen to leave his car at home. The maximum fine for failing to comply is \$360.

There are some exemptions: shift workers without access to public transportation; people en route to or from work.

Mr. Muldoon, whose own family vehicles were recently converted to liquid petroleum gas, said the scheme would cost \$13.5 million a year to administer. JANE NACZYNSKI-PHILLIPS

Cars are more costly to the environment than suspected

PARIS—The hidden costs of car ownership for society are about 5 percent of GNP in western industrial countries, according to a study submitted to an urban transport seminar here at the OECD.

The Organization for Economic Cooperation and Development study concludes that congestion, accidents, noise, pollution and other costs (like disfiguring and occupying open space) represent a charge of between 4 and 6.8 percent of the U.S. GNP. The figure was slightly lower in Western Europe and Japan.

If the full social costs of car use and road haulage are calculated, the study says, they turn out to amount to two or three times more than road users actually pay.

AIDA ATTALLAH

Brazil drafting its first integrated energy plan

RIO DE JANEIRO—A National Energy Commission headed by Brazil's Vice-President Aureliano Chaves was created to draft and carry out a practical energy model for the country.

Because crude oil is still lower priced than alternative sources of energy, the Commission is to work out ways to cut down the consumption of gasoline and other petroleum derivatives. At the same time it is to boost Brazil's gasohol and coal plans and develop hydropower to its full potential. The controversial nuclear program was set back until "hydro power is exhausted."

All aspects of the country's economy are to be taken into consideration in drafting this energy policy, which is the first nation-wide integrated plan.

GEORGE HAWRYLYSHYN

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Norway's new car junking program is a success

OSLO—A nation-wide car junking program introduced here last year has been a success in its first year, Norwegian government spokesmen say.

The program, based on the "polluter pays" principle, combines a refundable \$100 deposit when a car is registered with a \$100 premium, or refund, paid to car owners when they deliver their old cars for scrapping.

"The reform has been extremely well received by the public," said Environment Ministry spokesmen Jan Thompson and Vidar Ekeberg, key men in implementation and follow-up of the system.

"From May 1978 to April 1979 some 41,000 private cars and vans have been delivered to 95 collection points, resulting in about 20.5 million Norwegian kroners (\$3.95 million) in refunds to car owners," Ekeberg said.

He said the system cost the government \$5.96 million this past year while \$5.57 million were collected in deposits. The 1979 budget is \$12.1 million, including administration and more than \$1 million in state loans for more collection points. The immediate target is 140 collection points.

The system so far covers all private cars and vans weighing up to 3,500 kilos. Heavy trucks and buses may be added later and the deposit and premium may also be increased according to inflation, Ekeberg said.

Surveys discovered that 50,000 private cars had been discarded in Norway in 1976. Projections suggested an increase to 100,000 by 1990, Thompson said.

The Norwegian Ministry of Environmental Affairs proposed the system after one year of planning and studying the Swedish car junking system. "We decided to go for a more simplified system than in Sweden. Our system has already proved so efficient that it is now being studied by the Swedes," Ekeberg claimed.

The basic aims of the Norwegian system are:

- to reduce air, water and soil pollution by compacting and not burning car hulks. This entails collecting car liquids hazardous to the environment and the controlled disposal of shredded upholstery, tires, etc.
- to reduce traffic hazards and litter
- to increase recycling of steel and other metals to reduce imports.

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Thompson said the expected effect of the junking system will be to reduce steel imports by some 20 to 25 percent. Norway imported 40,000 tons of prime steel in 1976 and almost 60,000 tons in 1977. The hulks of 50,000 private cars yield up to 25,000 tons of steel scrap plus various other metals.

SPECIAL TO WER

Environmental Quality . . .

AT LAST—an almost-silent drill. Engineers at Queensland University in Australia have perfected a pneumatic rock drill with a reduced noise-level that is equivalent to traffic.

The university's mechanical engineering department has been working on the quieter drill since 1971 and spent about \$35,000 developing it. Contact: Dr. R. J. Hooker, Department of Mechanical Engineering, Queensland University, St. Lucia 4067, Queensland, Australia.

DRIVERS IN THE PHILIPPINES and operators of buses and public vehicles will be arrested if found playing their cassette recorders full blast or using excessively noisy horns. Offenders will be fined \$27 for the first offense, and up to \$677.50 for subsequent offenses, according to a new National Pollution Control Commission regulation.

IN INDIA, a study conducted at five urban centers and one tribal area found the hearing of one out of every five workers has been damaged.

According to the study by Professor Kameswaram, recipient of the 1979 Basanti Devi Amir Chand Award of the Indian Council for Medical Research, 21 percent of workers in industry suffer from noise-induced hearing disability. Prof. Kameswaram is an E.N.T. specialist and Director of the Institute of Oto-Rhino-Lanyngology at Madras.

RECENT RESEARCH IN THAILAND has shown that many textile workers are suffering from a whole range of ailments, many attributable to negative environmental factors.

Some 200 workers, aged 19-35, were picked at random from 6,000 textile industry employees in Samut Prakan, an industrial suburb of Bangkok. Examinations showed that most were suffering from inflammation of the ears, hearing difficulties and lung problems. Many workers also had skin diseases, eye diseases, and insomnia.

The leader of the research team said that management had not yet followed any of the suggestions offered to improve the work environment.

The study was conducted by the Faculty of Public Health of Mahidol University with the cooperation of Samut Prakan Hospital and health scientists from two Japanese universities under the leadership of Dr. Malini Wongphasit.

Noise problems get a hearing in many European capitals

BRUSSELS—A glance at the polls and into legislative chambers across Europe shows that the issue of noise has...well, been making some noise these days.

A recent West German poll reveals that 45 percent of those questioned believe that protecting human beings from noise is more important than building new roads. And on new roads, drivers will see huge walls of sound-proofing built where the roads pass near towns and villages. The same poll shows that three-quarters of West Germans are even willing to make economic sacrifices so that the attack on noise can be stepped up.

In Paris, the 24-nation Organization for Economic Cooperation and Development (OECD) warned in a recent report, "Reducing Noise," that too much noise can lead not only to hearing problems but to deterioration of the nervous system, to illnesses of the heart, the circulatory system and to insomnia. According to the OECD, the percentage of Londoners "troubled" by noise has more than doubled in recent years, from 23 to more than 50 percent.

The British parliament, meanwhile, passed a bill that takes into account the dangers of noise to property as well: It allows building owners to file for compensation if they think they can prove that the value of their property has been lowered as a direct result of new public works that produce excessive noise, vibration and/or dust.

The French government—in the OECD's own backyard—introduced a noise tax at Paris' Charles de Gaulle airport. The revenues will finance insulating nearby buildings against noise. And in Switzerland, a law passed recently made driving heavy trucks at night and on Sundays illegal.

But the coastal city of Goteburg, Sweden, probably has gone to the greatest lengths. Among other things, Goteburg is divided into "cells" that either permit the through-passage of motorized vehicles or ban it. The result has been a reduction of noise, carbon dioxide and traffic accidents.

GARY YERKEY

Britain may fund environmental protestors

LONDON—Britain is considering a fund to help protesters fight planning decisions which affect the environment. Plans for an "Objectors' Commission" of 15 independent appointed members, handling funds of £1.5 million (\$3 million) have been submitted to the Ministers for the Environment and for Energy by the Town and Country Planning Association, a leading conservationist organization.

The need for help was highlighted by the 1977 public inquiry into the expansion of the Windscale nuclear reprocessing plant, when much of the objectors' time and energy had to be spent on raising more than £100,000 (\$200,000) to cover the costs of presenting their case.

Friends of the Earth say they welcome the proposal in principle. They think serious objectors could be sifted out if the Commission adopted a system of funds to match those already raised by the

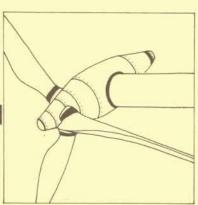
protesting group.

If the plan is accepted, the promised public inquiry into Britain's first commercial fast breeder reactor seems a certain candidate for objector funding. There are also regular, and pending, public inquiries into most proposed new motorways in Britain. New mining areas, urban extensions and chemical refineries also provide controversial planning decisions.

The TCPA has suggested a three-year testing period for the proposal, with funds for up to eight inquiries. The Ministers will be studying the proposal in detail before commenting.

BARBARA MASSAM

Spain will build a prototype energy windmill near Gibraltar



MADRID—Spain, second only to oil-rich Libya in its increased use of petroleum last year, has begun investigating the potential of wind power—a virtually untapped energy source already under serious investigation in Denmark and Holland, Britain, France and Sweden.

Prompted by the International Energy Agency's call for a worldwide energy-saving month in October, the Center for Energy Studies, a department of the Ministry of Industry and Energy, is sponsoring a 110-kilowatt wind station on Spain's most southerly tip, Tarifa—a small town in the province of the Cadiz overlooking the Straits of Gibraltar.

Designs for the windmill, which will feature a 65-foot tower with a capacity of more than 700,000 kilowatt hours, have been completed and the Center is now inviting contractors to bid for the job. The wind station is expected to be completed and ready for operation in 1981 and will feed the power it generates directly into the state-run electricity grid.

"The station will be a prototype enabling us to find and examine problems we will face in building far larger windmills, in the region of 1,500 kilowatts," says the official in charge of the project at the Energy Center. "From the results we get at Tarifa, we will be able to draw valid conclusions about more ambitious commercial projects in other parts of Spain."

In Europe...

THE NUMBER OF AEROSOL SPRAYS containing fluorocarbons should be cut by 30 percent to reduce the danger of ultraviolet rays penetrating the atmosphere. This European Community proposal, if approved as expected by the Council of Ministers, would mean that the nine EC member nations would have to cut aerosol production by the full 30 percent by the end of 1981.

ALMOST 100 DELEGATES from 25 countries assembled in Bergen, Norway, recently for a seminar on integrated socio-economic and environmental planning.

The seminar was staged by the U.N. Economic Commission for Europe (ECE) with the Norwegian Environment Ministry as technical organizer.

A \$92 MILLION RESEARCH PROGRAM designed to "gain understanding and control of radiation risks" has been approved by the European Community Commission and sent to the Council of Ministers for approval, an EC spokesman said.

The program, covering 1980-84, will result in the updating of basic standards throughout the nine-nation EC to protect the public and workers against the hazards of ionizing radiation. An EC spokesman noted that 90 percent of all man-made irradiation affecting the public comes from medical-diagnosis and therapy treatments, notably X-rays. The program will also evaluate the biological and ecological consequences of nuclear-power activities.

EUROPE-ECOLOGIE, France's environment party, narrowly missed representation in the European Parliament. In an unexpectedly strong showing during the June election, it captured 4.5 percent of the popular vote—125,000 votes short of the five percent minimum required to get a share of France's 81 seats in the Strasbourg assembly.

The ecologists did markedly well in French constituencies with recent or expanding nuclear facilities.

Because they fell short of 5 percent, they are not recognized as a major party, and this means that Europe-Ecologie will not get the usual government reimbursement for campaign expenses nor will it enjoy the "right of reply" on state-run French media on environmental issues, as a recognized party would enjoy.

Their unexpectedly strong showing (they were the only party outside the traditional big four to have any impact) may foreshadow a growing political role for the movement.

Water Quality ...

EGYPTIAN SCIENTISTS have discovered a plant that may lead to the control of bilharzia, the dread endemic parasite that affects 200 million people worldwide. The plant, Alcana Indica, contains a substance that kills the snails which carry the bilharzia worm at one stage of its life cycle. The plant grows wild in Egypt along irrigation canals and streams. Unlike other plants that also kill the snails, Alcana Indica has so far been found safe for humans and fish.

The plant was discovered when researchers noticed dead snails around the stalk of the plant. Then the pharmacology faculty of Cairo University and the bilharzia section of the National Research Center collaborated to determine just what happens. The researchers isolated the active component and found that it killed 98 percent of snails in an experiment, even with a mild concentration of only two parts per million. Scientists think once its chemical composition has been determined, it can then be manufactured and added to water or it may just be enough to cultivate the plant along the banks of rivers and streams where snails now thrive.

THE TOWN COUNCIL of Germiston in South Africa's Transvaal had the problem of disposing of 300 tons of waste caustic soda.

Germiston's Health Department decided to release the caustic soda into a large but sterile lake in town. The lake was highly acid because rain water was leaching minerals from surrounding gold mine sand dumps and slimes dams. The pH in some local streams had been down to a factor of one.

The caustic soda has neutralized the lake and now fish, introduced artificially, are thriving and fishing is allowed. Reeds are flourishing and so are water birds.

NEW LEGISLATION on water pollution control in Hong Kong will be introduced later this year, said David MacKaye, Environmental Protection Officer for Water Pollution Control.

Under the new ordinance, conditions will be imposed to restrict the quantities of polluting and toxic materials entering the aquatic environment from both the public and private sectors. At present, of the 250 miles of streams and rivers in Hong Kong, 40 miles are classified as heavily polluted.

THE CITY OF PUSAN in South Korea ordered 10 industrial plants to improve their waste discharge facilities. Authorities said the plants were discharging wastes into the sea in amounts three to four times greater than the permissible levels. The authorities gave the plants up to the end of October to comply.



Waterborne parasites threaten millions of South Americans

RIO DE JANEIRO—Schistosomiasis, the water-borne parasitic disease that now affects 200 million people worldwide, may spread to southern Brazil, Uruguay, Paraguay and Argentina via the River Plate hydroelectric projects.

International health officials are concerned that the disease, which is estimated to have infected 15 million Brazilians, will be carried to hydroelectric projects in the River Plate and Uruguay and Parana River areas.

Slow moving and still water, an ideal medium for the snail host of the disease, will be created by three dams that Argentina and Paraguay want to build downstream on the Parana River below the Brazilian-Paraguay Itaipu project.

Argentina and Uruguay are also in the final stages of building the Salto Grande project on the Uruguay River, which could create the same host cycle conditions.

"The dams will create a system of lakes and slow moving water, a very favorable environment for the spread of the disease," explained Carlos Adlerstein, Director of the Health and Ecology section for the Argentine-Uruguayan project.

Argentina is now virtually unaffected by schistosomiasis, or bilharzia as it is also known, but it could move quickly into the country as a result of the changed environmental conditions created by the hydroelectric projects.

"The great spread of the dreadful disease in the south of Brazil...is demonstrating the enormous risks which are entailed in uncontrolled tampering with the environment," Adlerstein said.

Besides the slow moving water, which is ideal for the life cycle of the snail host, workers carrying the disease are expected to follow construction work into the unaffected countries.

Attempts to control the snail are to have priorities over attempts to control men, explained an Uruguayan agriculture ministry official: "There is complete agreement that the best method of controlling schistosomiasis is the extermination of snails." It is more difficult to control men.

Brazilian health officials say that at present the disease is not found at the Itaipu project.

At the Salto Grande dam, \$8 million was spent to clear the area of the future reservoir. Fish and birds that feed on the snail will be introduced, as will sewage systems for the urban centers adjacent to the project. Streams are also being redirected to speed up the water flow.

If the environmental precautions do not succeed in limiting the snail, molluskicides will be used despite their adverse environmental effects.

"We believe that it will not be necessary to use them, but if we have to, it would only be on a limited basis," Adlerstein said.

GEORGE HAWRYLYSHYN

National and local authorities differ over Argentine land use

BUENOS AIRES—The Argentine national government has pitted itself against the government of Chaco province over moves by the province to sell off wild areas for development by private business.

Argentina's National Wildlife Board, a dependency of the national Agriculture and Livestock Ministry, is currently engaged in a battle to have at least part of the land to be sold off by Chaco turned into a wild-life preserve to save the region's rich fauna from extinction.

Chaco province is part of a scrub forest and savanna region known as the Great Chaco, more and more of which is being turned into farm land, raising the productivity of Argentine agriculture, but lowering greatly the chances of survival of the region's animal inhabitants.

Animals which have already become extinct in other Argentine provinces—jaguars, giant anteaters, giant armadillos, tapirs and other species—still live in the wooded Chaco area.

The plan of the provincial government is to drain huge areas of the humid Chaco in the south and clear the dry wooded Chaco in the north for agricultural exploitation by private groups of individuals who will buy the land in packets.

A group of prestigious foreign naturalists were invited to Argentina by concerned environmentalists for the purpose of preparing a report to convince the Chaco government to set aside part of the land for animal protection. Their report, though not out yet, is expected to declare mammals the most endangered group in the area and to call for them to be saved from extinction.

Claudio Blanco, head of the National Wildlife Board indicates that the ideal size for a preserve would be about 400,000 hectares.

DAN NEWLAND

Brazil's solar energy potential greater than other countries

RIO DE JANEIRO—A U.S. scientist told a Brazilian audience that this country has more potential solar energy than any other and estimated that if harnessed, \$600 billion dollars worth of solar energy could be generated each year.

Speaking at a nuclear seminar at Belo Horizonte, George C. Szebo, a former director of NASA and a solar energy expert, said, "Each year, the solar energy that could be generated in Brazil amounts to six times the energy that could be produced from all the known petroleum reserves."

GEORGE HAWRYLYSHYN

In Latin America ...

BRAZILIAN PRESIDENT Joao Baptista Figueiredo has ordered all federal vehicles converted to alcohol fuel as part of his campaign to introduce gasohol to the country.

The President set an example by having his personal limousine, a Brazilian-made Ford

Galaxy, converted to alcohol.

All state and municipal governments are expected to follow the federal example, and if all the state-owned fleet were converted to alcohol it would mean that 200,000 vehicles would stop consuming mostly imported petroleum.

After the conversion of the government fleet, the Brazilian gasohol plan calls for the conversion of the urban bus fleet and then the

VENEZUELA, which exports some 700 million barrels of oil a year, is now importing gasoline, according to El Diario de Caracas. To meet the demands of Venezuelan drivers, whose cars consume an average of 1,477 liters *more* a year than the Americans' average 2,966 liters, the government last year imported nearly 1.5 million barrels of high octane gas at a cost of \$34 million

Reasons for the rise in consumption are chaotic public transportation and the consequent increased reliance on private cars—and

government-subsidized gas prices.

Caracas buses run on diesel which contains up to 5 percent sulphur, according to a Central University study by Anaida Segovia de Diaz. Venezuela exports its higher priced desulphurized oil, leaving the untreated oil for local consumption, with resultant polluting effects. Dust analyses in the valley showed 300 times the advisable lead limits.

VENEZUELAN YOUTH MINISTER Charles Brewer has provided the capital, Caracas, with a brief holiday from the smog by closing off four city avenues on Sunday mornings and turning them over to runners and cyclists. The measure is so popular, authorities are studying the possibility of building a lane expressly for cyclists above the Guaire river, paralleling one of the most congested highways.

PERU AND BOLIVIA have signed an agreement to carry out research on resources in Lake Titicaca, with a view to forming a binational company to start trout farming.

Lake Titicaca—on the Peru-Bolivia border—is the highest navigable lake in the world. It is also "fished-out." The plan is to transplant 600,000 young trout to various parts of the lake.

An official says that the project should begin around the end of the year. It is being financed (\$300,000) by the Andean Development Corporation.

In Africa ...

SOUTH AFRICA, now restricted to buying all its crude oil on the spot market, has reduced the speed limit in all metropolitan areas, including freeways, to 70 kilometers an hour. Fuel pumps close over the weekend. The result: fewer people are using their cars, relieving congestion in inner cities.

GAME RANGERS are now using motorcycles in the bush because of the possible ecological effects of bush vehicle tracks through the 20,000-sq.-km. Kruger National Park. The experimental one-year period for using motor bikes (which ended in mid-1978) has been pronounced "very successful" (National Parks annual report released June 1979).

Apart from allowing the deep ruts made over the years by four-wheel-drive vehicles to grow over, the use of motorcycles allows patrol in remote areas inaccessible to four-wheel vehicles and has cut the park's fuel bill.

IF ECONOMIC SANCTIONS are not lifted against Zimbabwe Rhodesia, the country could hang on for 300 years using its coal reserves, one official says.

Recent reports show that the only coal mine in the country has 2.5 billion tons waiting to be dug out. Finance Minister David Smith says this could last three centuries at present consumption rates.

Ecologists say the Wankie colliery has little effect on wildlife in the immediate area.



CONTRARY TO EARLIER REPORTS, a decision to realign the Jonglei Canal in the Southern Sudan has not yet been made (WER, March 12, p. 7).

In an interview, Yahya Abdul Meguid, the Sudan's Minister of Irrigation, told WER that the canal's route is still under study. The minister's contradiction of earlier reports stems from a split among government officials involved in the monumental undertaking. The commissioner of the Jonglei Canal project, Dr. Gama Hassan, favors realignment. Dr. Hassan, a southerner, says the people of the region through which the canal will cut want the waterway moved to the east. Not only will it be less disruptive to annual migration routes for the people and their cattle, but it will avoid the destruction of ancestral burial grounds. Meguid says he will not be swayed by social and environmental arguments. "I will agree to a change in the route only if it is justified by technical reasons."

Euroconsult, a Dutch consulting firm, has been studying the effects of the canal on the region and will soon put forth its recommendation on the best path for the canal. It's expected that the Sudanese will then take a vote on the matter.

Uganda will need years to rebuild its herds of wildlife

NAIROBI—Among the many problems facing Uganda's new civilian government is the rebuilding of what were, only a few years ago, some of Africa's finest reserves of wild game.

Only one of Uganda's three national parks—the Kidepo Valley National Park, situated near the Sudan border—has escaped a massive slaughter of its wild game population. Ruwenzori National Park, in western Uganda, and Kabalega Falls National Park, in northern Uganda, have only a fraction of their former populations of elephant, buffalo, hippo, rhino and giraffe.

Residents in nearby areas say thousands of these animals were slaughtered by troops of Idi Amin, either to provide food or for their valuable ivory and rhino horn.

Less than 10 years ago, Kabalega Falls National Park (then known as the Murchison Falls National Park) contained 30,000 buffaloes, 14,000 elephants, 13,000 hippopotamus, 600 crocodiles and smaller numbers of rhinoceros. It also contained substantial numbers of lions, leopards and other valuable animals, and was Uganda's top tourist attraction.

No precise count has been taken of the remaining herds, but Uganda park officials say there may be only a few hundred elephants left and possibly 10,000 buffaloes. Herds of antelopes, which formerly totalled 100,000 animals, are now down to less than 20,000.

Idi Amin's fleeing soldiers slaughtered animals indiscriminately, often using machine guns, as they retreated from Tanzanian forces in April and May. National park officials say it will take years for the herds to recover, and in the meantime strenuous antipoaching operations will be needed as people living in adjoining areas are used to raiding the wild game reserves for food.

CHARLES HARRISON

South Africa's "oilfield": ethanol from cassava plants

JOHANNESBURG—Ten years ago the Makatini Flats in northern Zululand was a dry plain that supported thorn trees and goats. Zulus peddled wooden curios to boost their meager income. For wages the Zulus had to trek far to the south for work in the cane fields or to the gold mines of the Rand.

Now the oil crisis may well change this arid plain into an "oil field."

The cassava plant, staple diet in many parts of Africa, grows well there, and it will be the raw material for a huge ethanol project into which the South African government has just put \$21 million.

The Corporation for Economic Development (CED) has been researching the project since the 1973 oil crisis but until now ethanol appeared to be far too expensive when compared with producing petrol from South Africa's coal fields. Now it is looking

more attractive. And the "oil fields" will not compete with the

area's croplands.

Huge plant nurseries have sprung up. Using the rapid cloning system, a single plant can reproduce itself 18,000 times—enough for 1.5 hectares. One experiment produced 30 tons of biomass a hectare. Thirteen ethanol factories can be accommodated in the Flats: they could employ 26,000 and produce 520 megaliters of fuel a year. The project is expected to bring new wealth to the area and so check the flow of rural people to the cities.

Another side effect is expected to be an opening up of the area for more tourism. At present it has no tarred roads, so few traverse its sandy tracks to the big game areas north of it and the game fishing grounds along its almost inaccessible coast. JAMES CLARKE

Australian land reclamation is expensive failure



PERTH-A dream to irrigate and cultivate land in the arid Kimberley region of Western Australia has failed after an expenditure of 20 years and \$100 million.

Nevertheless, an investigative committee recommended that Australia continue to fund the scheme for a further five years.

The Ord River scheme began as an election campaign promise in the 1950s, and the first \$5 million was forwarded from the federal government to the West Australian government in 1958.

The plan was to irrigate a vast area of the remote northern part of the state, 3,500 kilometers from Perth. Forty pioneering farm families decided to risk moving to the isolated spot, which they hoped would become a flourishing agricultural area and gateway to Asia.

Problems dogged the farmers from the outset. No one knew just which crops could survive, although the 12-month growing season meant no limit was imposed in planting. Crop after crop failed; especially disastrous was the 1974 cotton crop. In 1975, droves of farmers moved out, plagued by insects, winter monsoons and the area's isolation. Today, only eight farmers and 2.300 non-farming Ord River inhabitants remain.

The joint state-federal committee investigating the Ord River scheme since November 1977 reported that "in terms of contribution to net increase in national output, the project has been of no benefit." But it recommended continued funding for a further five years to research which crops do have potential, and to guarantee prices for those crops. The committee found expansion beyond the 12,000 hectares now under cultivation unwarranted.

JANE NACZYNSKI-PHILLIPS

Forestry ...

THE DIEBACK FUNGUS killing Western Australia's woodlands is worse than reported (WER, Feb. 26, p. 7). The state's Minister for Forests, D.J. Wordsworth, informs WER that the fungus, Phytophthora cinnamomi, has already infected 195,000 hectares of state forest and is spreading.

To find out just how far this fungus has gone, the state this year began a six-year program of aerial photography, costing \$200,000 a year. Only 15 days each year, in April and May, have the high cloud cover necessary for shadowless

photography, Wordsworth said.

PICTURES taken by an orbiting Earth Resources Technology Satellite (ERTS) show rapid deforestation of the northern region of Bangladesh and denudation of vegetation in the Kaptai lake area to the south-east.

Bangladesh uses remote sensing technology for the development of its resources under the LANDSAT program financed by FAO and

Dr. Norman H. Macleod, a NASA space scientist who led the LANDSAT task force in Bangladesh over the last eighteen months, suggested large scale afforestation. He also proposed measures for storing excess water from the rainy season for use in the dry winter months to prevent desertification.

THE DEVELOPMENT ACADEMY of the Philippines (DAP) has projected that forest lands in the Philippines will be cut from today's 29,000 hectares to 3,000 hectares by the year 2,000.

Of the country's 59 proclaimed national parks with a total land area of 293,000 hectares, only seven have come up to the standards set by the International Union for the Conservation of Nature (IUCN). Conservationists are concerned about the country's wilderness, which is the natural sanctuary of 850 species of birds and more than 225 species of mammals.

To integrate efforts at saving the national environment, the Ministry of Natural Resources and the DAP have joined hands to launch the Parks and Wildlife Development Program.

Being sought is a long-overdue national policy on parks and wildlife and an action program for illegal settlers and nomadic tribes inside the parks. They have already evaluated 31 existing parks and 23 proposed ones. Some were found worthy of development, others proposed for removal from the list of Philippine national parks.

In Asia . . .

CONSTRUCTION of the Philippines' 620-megawatt nuclear power plant was suspended by President Ferdinand Marcos. The Philippine government said it will cancel its contract with the American Westinghouse Corporation unless Westinghouse gives firm assurances of the plant's safety. Marcos said the decision was made in view of the Three Mile Island accident in the United States last March.

The Filipino plant was due to be completed by

THE SOUTH KOREAN government plans to build its 9th and 10th nuclear power plants at Pugu, 220 kilometers southeast of Seoul.

CHINA IS SLOWING WORK on nuclear power development because of safety concerns, said Wang Yao-ting, President of the China Council for the Promotion of International Trade (CCPIT). However, China is still negotiating with France on the purchase of two nuclear power plants. French sources said each of the plants will have a capacity of 900 megawatts with an estimated total cost of \$2.3 billion. At present, China does not have any nuclear power stations.

INDIAN PRIME MINISTER Morarji Desai said that the danger posed to the Taj Mahal by the 6-million-ton oil refinery at Mathura, 40 kilometers away, will have to be examined more thoroughly if the government is to decide to shift the refinery, which is now scheduled to start towards the end of 1980, six months behind schedule.

One reason for the delay—during which its original cost has doubled to around \$200 million—is the extra expense for equipment to fight air and water pollution, estimated to cost about \$1 million. Whether this will protect the priceless monument from sulphur dioxide emissions from the refinery is doubtful, considering that the marble structure of the Taj Mahal is already being eroded by contaminants from other industrial units nearby (see WER, Nov. 20, 1978, p.1).

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Pakistan prepares flood control plan to cost \$630 million

ISLAMABAD—A national flood protection plan costing \$630 million has been prepared in Pakistan for implementation over the next 10 to 12 years.

It was prepared by the National Engineering Service of Pakistan, a state-owned company, and the Federal Flood Commission.

The phased plan envisages an expenditure of \$176 million during the current five year plan period ending in 1983 and \$455 million for the 1983-90 period. The chairman of the Federal Flood Commission, Khalilur Rehman, says that the federal government spent \$13.1 million this year on flood control measures. He said this was in addition to the funds allocated by the provincial governments. He said bunds (embankments) in various parts of the country had been raised, widened and strengthened.

A satellite readout station has been set up at Lahore to collect information about cloud formation; a radar station is at Sialkot to collect rainfall data in adjoining areas and Kashmir. In addition, two computer models have been set up at Lahore. Khalilur Rehman said that 24 telemetric stations collect data about water discharge at different points and another 17 such stations would be ready before monsoon season next year. MOHAMMED AFTAB

Thailand publishes eco-impact guidelines for projects

BANGKOK—The National Environment Board (NEB) of Thailand has released its official Guidelines for the Preparation of Environmental Impact Evaluations. This development follows recent legislation (the National Environmental Quality Act, Number 2, 1978) which among its provisions requires industries and government agencies to submit at least preliminary environmental impact studies.

More specifically, all agencies or individuals in both the private and public sectors who propose the construction of a new project or major changes in existing projects that will significantly alter the existing natural and man-made environment are required first to undertake an Initial Environmental Examination (IEE) for review by the NEB.

If the IEE indicates a follow-up study is needed, then an appropriate Environmental Impact Statement (EIS) must be prepared by the individual or agency proposing the project. The NEB will evaluate the project's economic benefits versus possible impairment to precious environmental resources or values. It will either define environmental constraints on approved projects or indicate additional environmental protection measures required for the project to be reconsidered.

According to NEB Secretary-General Kasame Snidvongs, considerable latitude will be allowed in preparing the EIS: "The main requirement is to present sufficient information on all sensitive environmental questions to permit NEB to arrive at a fair and objective judgment. The aim is realistic protection...within realistic economic and other constraints." KENNETH SNIFFEN

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Filipino nuclear reactor beset with problems of buck-passing

MANILA—The 620-megawatt Westinghouse nuclear power plant being constructed 50 miles northwest of here on the Bataan peninsula is running into more problems and increasing opposition.

The latest snafu involves the U.S. Nuclear Regulatory Commission's (NRC) reluctance to grant export licenses for the reactors and the initial load of enriched fuel plus three reloads. NRC staffers have recommended that a license be granted for the export of components to build the reactors, but licenses for the reactors and fuel are awaiting U.S. executive branch comments.

Philippine opponents have now petitioned for a NRC hearing. The petition, filed April 19 in Washington, D.C., claims that new information about volcanic risk, based on an on-site study by the International Atomic Energy Agency last year, indicates that the nuclear plant site is completely unacceptable for safety reasons.

The petitioners are the Center for Development Policy, Nicanor Perlas and the Philippine Movement for Environmental Protection. They complain in their petition that the IAEA report has not been made public and that it should be. They contend that from what they have been able to learn of the IAEA findings, the dormant volcano near the Bataan site is considered a threat to the reactor, and the IAEA recommended that a special team be set up to constantly monitor volcanic activity in the area. This recommendation has reportedly been accepted by the Philippine Atomic Energy Commission (PAEC) which has ordered such a team into being. Petitioners feel that the risk of a volcanic eruption or an earthquake is great enough to make operation of the plant a real danger to public safety and therefore the export licenses should not be granted.

A spokesman for the NRC in Washington said there has been no decision about having a hearing. It would take at least six months to get comments and technical studies from all concerned before a hearing could be held, which would delay reactor completion even further, he said. The plant is already six months behind schedule (new start-up date mid-1983) and likely to fall further behind as debate at the NRC continues.

The current problems are only the latest in a series that have hampered the project since late 1977 when foreign press reports began to question the method in which Westinghouse was given the contract (no bidding, a "few million dollars" in "agent fees") as well as the dangers of placing the site in an area known for seismic activity. President Marcos promised a complete review of the project but has declined to reveal if it has been carried out and what it uncovered.

Nuclear Power ...

AN EMPLOYEE of Western Mining Corporation in Western Australia pleaded guilty in a court of petty sessions to a charge of having lost a radioactive measuring device in the firm's nickel mill. He was fined the maximum of \$100.

The device was lost November 14 last year and later turned up in a scrap metal heap in Singapore (See WER Feb. 12, p. 4). Radiation was detected in the blast furnace of a smelting company and thus the device was found.

The device contained Celsium 137 and had a radioactive life of 30 years.

THE FRENCH DEVELOPERS of the world's only method of liquid nuclear waste disposal are exporting their technology. They concluded an agreement in mid-May—the first of what they claim will be many—with a West German firm to build a vitrification plant beside the Karlsruhe nuclear power facility.

The French company, Societe generale pour les techniques nouvelles (a subsidiary of the French Atomic Energy Commisariat), which in January announced the successful development of the vitrification process (WER, Feb. 12, p. 4), signed a construction agreement with the West German Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen.

The U.S. and England have worked for years on the development of the process but have not succeeded in going beyond the experimental stage. France is thought to be the only country in the world to have successfully tested the technology for solidifying liquid nuclear wastes —a vitrification plant has been operating successfully in Marcoule, France, since June 1978.

A PROGRESS REPORT on the work done by some 500 European research scientists during 1978 in the field of radiation protection has been published by the European Community (EC) here.

The 854-page report summarizes about 250 research projects that studied radioactive contamination of the environment, genetic effects of ionizing radiation, short and long-term effects of ionizing radiation and methods of radiation risk assessment.

It refers to more than 600 relevant scientific publications and lists monographs, proceedings and technical reports on radiation protection data. Particulars are provided on about 40 symposia, seminars and study-group meetings.

The 1978 Progress Report on the Radiation Protection Program of the European Community is obtainable from the Office des Publications Officielles des Communautes Europeennes, Boite postale 1003, Luxembourg.

What is clear, however, is that his martial law regime has soured on nuclear power. President Marcos, according to one report, said he was considering cancelling the plant because Westinghouse could not guarantee its safety. If Marcos can prove it is unsafe, he may not have to pay the \$1.2 billion it has already cost. But if he can't prove it is unsafe, Westinghouse and the Ex-Im Bank will be paid in full—even if licenses for the plant's operation are never granted by the NRC.

Meanwhile, plans drawn up in 1976 calling for construction of seven more nuclear plants by the year 2000 have quietly been scrapped.

BERNARD WIDEMAN

Europe increases use of nuclear-generated electricity

BRUSSELS—In 1978, for the first time, the use of nucleargenerated electricity in the nine-nation European Community (EC) surpassed 10 percent of the total electricity generated by the EC, according to a report released here recently. The report shows that the Community's 57 nuclear reactors produced 124,617 gigawatts an hour by nuclear means, up 11 percent compared with 1977.

West Germany, according to the report, produced more nuclear-generated electricity than any other EC country—33,857 Gwh, down .5 percent from 1977. Great Britain produced 32,463 Gwh, second highest, down 9.3 percent.

But France—the third nuclear energy producer in the EC during 1978 (28,997 Gwh)—showed a gain over 1977 of 69.7 percent. Belgium's production (11,872 Gwh) was up by 4.9 percent over 1977; Italy's (4,177 Gwh) rose by more than 30 percent; and the Netherlands' (3,810 Gwh) jumped by more than 10 percent.

GARY YERKEY

Nuclear foes form dangerous link with Basque separatists

MADRID—The dangerous link being forged in Spain between nuclear protest and the Basque problem was strengthened on the anti-nuclear lobby's first day of international protest when a young demonstrator was shot to death—the anti-nuclear movement's third victim here in 18 months.

All three died in the northern Basque provinces, where a growing wave of opposition to nuclear development has become strongly identified with nationalist and separatist politics. The latest killing, by a paramilitary civil guard, threw the Basque provinces into the worst turmoil of the past 12 months.

The killing, on June 3, came as 50,000 Spaniards rallied across the nation to demand a halt to Spain's ambitious nuclear program, designed to supply 15 percent of the nation's total energy needs by 1987.

Nuclear protest in Spain is beginning to gain ground in new sectors of the population. Dock workers announced they will boycott cargoes for nuclear plants, and Basques called for a campaign of civil disobedience, in the form of non-payment of energy bills, against the big energy companies committed to nuclear energy.

JULIE FLINT

English protest spent fuel shipments through London

LONDON—Until protests from Friends of the Earth and anti-nuclear groups were reported in the British press this June, the vast majority of Londoners were unaware that highly radioactive spent fuel was travelling by night freight train through their midst.

Packed in 50 ton flasks, the fuel is transported from nuclear power stations on the east coast to Windscale on the Cumbrian coast for reprocessing.

In 20 years of operation, there has been no accident, claim the Central Electricity Generating Board and British Rail.

But at the Essex rail terminal year in Southminster, Patrick Kinnersley, an occupational health lecturer, spent 45 minutes photographing a container with children at play around it. The flasks were on a low-loader truck awaiting transfer to a special rail wagon: its guard had not turned up. Kinnersley said he could easily have interfered with the cargo, even driven the truck away.

BARBARA MASSAM

After 10 years, Sweden allows its uranium ore to be processed

STOCKHOLM—Two hundred tons of uranium ore stored under lock and key since 1969 at Ranstad, in southern Sweden, will for the first time be converted into fuel for use in Swedish nuclear power plants.

The government will begin transporting 100 tons to France under strictest security against theft or sabotage. Conversion and enrichment will yield 20 tons of fuel, enough to run a nuclear power plant about one year, according to Svenska Dagbladet, a Stockholm morning newspaper.

The alum shale in the Ranstad area contains about 80 percent of Europe's uranium reserves (see WER, Dec. 4, 1978, p. 1). Since 1969, pressure from anti-nuclearists, environmentalists and vetoes by the three communal councils most directly involved have shelved mineral exploitation there. Although production has been banned, the government continues research into techniques for extracting not only uranium but all possible metals from the shale.

Swedish Alum Shale Extraction Company formed by Boliden and state-owned LKAB, two of the country's leading mining companies, is standing by for a go-ahead for further exploitation, but its requests so far have been turned down by the government.

Just recently Erik Huss, minister of industry in the Liberal government, told Parliament that the government would not give permission to work the shale unless those who want to quarry the ore have solved the environmental problems in that connection.

"If mining does become topical again, careful investigation and thorough tests of the consequences for the environment will be carried out first," Huss said.

SPECIAL TO WER

Toxics...

SEOUL CITY OFFICIALS said they will ban cultivation of food crops in some areas around the South Korean capital because of heavy metal pollution.

Academic studies conducted in the past few years have reported high levels of heavy metals in soil and water samples taken around Seoul and other industrial centers.

In another move, the Minister of Health and Social Affairs, Hong Sung-Chul, said the government has allocated \$232 million for loans to industries for installing anti-pollution equipment between 1979 and 1982.

RESIDENTS OF PITSEA, England, have lost their fight to restrict the amount of toxic waste being dumped at the country's largest tip on the nearby Thames marshes.

There has been a ten-fold increase in waste dumped there since controls and penalties on illegal dumping were tightened up by the 1972 Deposit of Poisonous Wastes Act. Residents say the 1,500-acre site was never intended to take this amount, particularly the liquid chemical waste coming in at the rate of 50 tanker loads a day. Pitsea takes 210,000 tons of waste a year, about 7 percent of the national amount.

On May 30th, Michael Heseltine, Secretary of State for the Environment under the new Conservative Government, said he was satisfied that risks of pollution to groundwater and of floodwater entering the site were negligible. The advantages of satisfactory waste disposal, he said, outweighed the objections of the townspeople and those of nature conservationists against loss and deterioration of habitat through construction of a new access road.

The Pitsea Tip Resistance Group may still ask the local council to close the existing access road until the new one is built. They feel it would be worthwhile even for such a short time for alternative sites, now under-used, to be brought in to share the load.

EATING THE LIVER OF FISH caught in the seas around French Polynesia can be dangerous, a consultant with the World Health Organization has warned. Dr. Takeshi Yasumoto said the liver can be poisonous even when the fish is nontoxic.

The source of this poison is a one-celled organism called dinoflagellate which thrives on the algae growing in coral reefs. These microorganisms multiply when their environment is disturbed.

Blasting reefs to build a runway, wharf or pier have triggered explosive outbreaks of ciguatera, the fish poisoning phenomenon, Dr. Yasumoto said.

Energy Management . . .

A PARLIAMENTARY COMMITTEE on air pollution has urged the government of India to study the feasibility of shifting the Mathura refinery to save the Taj Mahal and other monuments in Agra (WER, Nov. 20, 1978, p. 1)

In its report presented to Parliament, the committee says that the Taj Mahal can recoup the entire cost of the refinery in a few years from tourism.

According to the committee, Mathura is one of the worst possible sites for setting up a refinery from the archaeological, ecological and environmental points of view.

The committee visited the site and was informed that already \$125 million had been spent to purchase the land and import machinery.

The report reminded the government that the Parthenon in Athens had been seriously affected over the last 30 years by sulphur dioxide and other pollutants. Similarly Cleopatra's Needle in New York had deteriorated more in the past 70 years than it did in the previous 3000.

THE SOUTH KOREAN government is currently working out an energy-saving package under which tolls for non-business vehicles will be hiked drastically during holidays. Shops and amusement enterprises will limit the hours they are open.

However, there will be no rationing of oil products for the time being.

RISING OIL PRICES have killed a promising pilot project for low-cost housing materials in the Sudan.

The pilot project at Khartoum (WER, Sept. 25, 1978, p. 4) was designed to show the practicability of sun-dried asphadobe blocks made from local soil stabilized with asphalt. The asphadobe blocks were durable and resistant to termites; they were also economical, so long as asphalt was available at reasonably low prices.

Several hundred low-cost houses were built in the Khartoum area from asphadobe blocks and have proved a success. But when attempts were made to extend the project by transporting the blocks to more distant areas of the Sudan, increased transport costs coincided with a series of oil price hikes—and the asphadobe blocks became more expensive than conventional bricks.

The Sudan's Minister for Cooperation, Commerce and Supply, Mohamed Hashim Awad, explained that the Sudan had to use its own asphalt production for road construction projects and had no surplus. Asphalt used to be imported from Iraq, but then Iraq found other (and more lucrative) markets for the asphalt and cut the supply.



Norway plans to look for oil in its northern fishing banks

OSLO—Public polls have revealed considerable concern and skepticism in northern Norway about government plans to start oil exploration in some of the country's best fishing banks.

The government stated in a white paper that environmental protection up north will be based on the same principles as those applied south of the 62nd parallel, which are considered among the strictest in the world. Preparedness for possible waste and pollution clearance operations will be stepped up, and new regulations are expected from the Ministry of Environmental Affairs. Emphasis will be placed on the further development of protection equipment; the risk of blow-outs has received a lot of attention. And the Norwegian Fishermen's Organization is satisfied that the white paper acknowledges the right to compensation for loss of fishing grounds; it should be about \$7 million annually.

Norway's production of oil and gas this year will gross \$4 billion. This will give the government tax revenues of \$1.5 billion or twice as much as from all other sectors of Norwegian industry.

SPECIAL TO WER

Romania wants to meet 50% of its energy needs with solar

BUCHAREST—Romania, Europe's second biggest oil producer after the Soviet Union, is now a net importer of oil, officials said earlier this year, and they warned the country was heading for a period of energy cutbacks and belt-tightening conservation. They disclosed Romania's "sure" reserves would last about 10 years at the current level of exploitation if no other oil reserves were found.

And so they have devised the "Sun Program" for the long-term gradual replacement of up to 50 percent of Romania's fuel needs in agriculture, forestry, textile, food processing and building materials industries. Solar energy will also be used for irrigation through thermo-solar and wind-driven turbines and water pumping stations and for the supply of biogas.

Romanian energy experts are now working on a "solar map" of the country. "With 150 sunny days on an average, Romania can make the sun work," said C. Teodorescu, manager of the Institute of Scientific and Technical Inventions. Specialists claim the usable reserve of solar energy in Romania is the equivalent of some eight million tons of fuel a year.

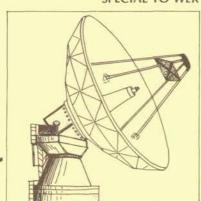
By 1980, basic studies should be concluded for the construction of solar houses and their large-scale use. And in what experts describe as "probably the biggest such project in Eastern Europe," 1200 guests at three hotels in the Romanian Black Sea resort of Saturn take solar-heated baths. The complex operates five months a year and is saving about 70 percent on fuel costs, they claim. According to the program, 11 hotels at the seaside resort of Neptune will start using sun power for water heating in the next few years.

The Energy Research Institute in Bucharest is working on the design of a solar electric power plant.

In industry, solar energy is being used for drying timber and ceramic articles and for preparing concrete and concrete prefabs.

SPECIAL TO WER

Spanish solar conference says sunpower will be cheaper



MADRID—By 1990, every watt of electricity produced from oil will cost 20 cents. A watt produced from solar energy will be two and half times cheaper, or only eight cents.

These eye-catching statistics came from a recent conference on the future of solar energy, organized here by the Centro de Estudios de la Energia, a department of the Ministry of Industry. The source, Dr. Michel Rodot of the French National Scientific Research Council, told delegates his country is currently saving three million tons of oil a year through the use of bio-converted solar energy. Dr. Rodot said the industry should aim at reducing the cost of one solar kilowatt to \$500 by the mid 1980s—or to \$300 with the use of cheap semi-conductors like cadmium sulphide. Once the initial investment is paid off, he stressed, the energy would be free—barring maintenance and salary costs.

The conference was the most important on solar energy ever sponsored in Spain, and its debating points ranged from methods of capture and economic viability to potential markets and ways of promoting the industry. Spain is the site of a 1,000-kilowatt solar complex near the south-eastern city of Almeria. Eight International Energy Agency members besides Spain are currently investing in the project—West Germany, the United States, Switzerland, Sweden, Belgium, Austria, Italy and Greece. Britain withdrew after its first investigative stage. The Spanish government is also financing a second 1,000-kilowatt solar plant in the Almeria complex. Spanish officials say the infrastructure of the solar complex is nearing completion and work is about to begin on a sophisticated weather station.

Renewable Energy...

SOLAR-2000 is an easy-to-read booklet just published by the United Nations Environment Program. It quickly outlines what solar energy is and how it and other renewable energy sources can be used. The 27-page booklet also has a quick roundup of what UNEP's member countries are doing in solar research. Copies can be obtained from UNEP headquarters, P.O. Box 30552, Nairobi, Kenya.

FRANCE WILL HELP MALTA carry out experiments on partially powering water distillation plants with solar energy. Malta's Minister of Development Wistin Abela said also that West Germany would spend \$2.5 million in Malta to experiment on windmill energy, to produce 500 kilowatts per unit (April 23, p. 7).

SWEDEN'S FIRST EXPERIMENT with a wind-powered generator has proved promising.

As a result, the Bureau for Research into Energy Production (NE) is now studying bids to build two full-scale windmills with a capacity of 2-4 megawatts each by 1981. (A modern nuclear power plant generates 1,000 megawatts.) They will provide data for the government's decision on the future of wind power in Sweden.

A study prepared for NE by the Swedish Industrial Construction and Calculation Office (AB) suggests that thousands of windmills would have to be built if wind power is to make an effective contribution to the nation's energy supply. The study therefore recommends placing between 1,600 and 2,400 wind-power aggregates in the Baltic Sea and the southern Bothnian Gulf. They could meet about 40 percent of Sweden's present-day electrical energy consumption.

THE SOUTH KOREAN GOVERNMENT plans to supply 44 percent of the country's total energy demand with solar energy by the year 2000. Development of an alternative energy system for coal is imperative since the total coal reserve is estimated at 2 billion tons, which will last for only 40 more years.

Director of the Solar Energy Research Institute of Korea (SERI-Korea) Yim Tae-soon said Korean resources and technology can lower the cost of generating solar electricity. Great quantities of silicon are necessary for the manufacture of solar cells, and South Korea has an ample supply. In order to generate 1,000 megawatts of electricity, two million tons of silicon are needed; South Korea has an estimated reserve of 230 million tons.

Water Quality ...

THE KERALA STATE GOVERNMENT in India took a firm step recently to prevent water pollution in one of its rivers.

A textile factory has been closed down because it failed to lay a pipeline for about 6 kilometers downstream and discharge effluents into a river there.

People living in the area complained, officials met, summoned the factory management and held a hearing.

At the meeting, people showed dead fish floating on contaminated water to prove their point that the river water was undrinkable and therefore a health hazard.

State officials immediately ordered the closure of the factory until the pipeline is finished.

A MOSQUITO-EATING FISH has been introduced into Filipino streams and rivers (in Mindoro, Mindanao and parts of Luzon) by the Malaria Eradication Service. The Gambusia affinis, a fast-multiplying fish, was found to be effective at field laboratories in Tanay and Rizal. At the same time, a mosquito predator called Poecilia reticulata is also being used.

TO HELP SAVE SWEDEN'S DYING LAKES, environment authorities are experimenting with a weed-eating carp, originally from China.

This fish, a voracious vegetarian, eats through weed-choked lakes and is an excellent way of keeping a lake from becoming a bog, according to a report from the Research Institute for Protection of Water and Air (IVL).

IVL said carp cleaning is both cheaper and gives longer lasting effects than, for example, mechanical clearing. The report condemned the use of chemicals for cleaning lakes as an "unmotivated and illegitimate spreading of poisons."

A RESEARCH INSTITUTE to study the potential of water hyacinths for scientific, economic and ecological use will be put up in the Philippines with the aid of the government of India.

Various products including animal feeds, antibiotics, alcohol, cigarette filters and yarns have been derived from water hyacinths in research and experiments carried out so far.

The proposed research institute intends to develop an ecological waste treatment project because the water lily is an effective and natural way to combat water pollution.

At present, the most widely used antipollutant is sodium nitrate, which the government has banned because it harms marine life.

France blocking Europe's plan to reduce Rhine's salinity

PARIS—France is still blocking a European plan to reduce the salt content in the Rhine river—Europe's first multi-nation pollution control program. In 1976, France, West Germany, the Netherlands and Switzerland agreed on a \$40 million plan to curb any additional input of brine into the river and instead to inject salt liquor from France's Alsatian potassium mines into deep shafts. The French mines dump six million tons of salt liquor annually into the Rhine.

In a stormy public session at the Council of Europe in Strasburg, the three other riverine nations (which have already put \$30 million in escrow for the project) criticized the French government delay.

France's National Assembly has refused to ratify the plan because of strong local opposition in Alsace, where people fear that the injected salt could infiltrate from the shafts and leak into the over-laying ground water.

The public hearing failed to budge French authorities. The Dutch, the main victims of the French pollution, have built an ingenious system of dunes to filter the water as it reaches the mouth of the Rhine, but the problem cannot be solved without cooperation at the source upstream in Alsace. AIDA ATTALLAH

Carp replace chemicals in Egypt's weed-choked canals

CAIRO—After years of being the world's most troublesome water weed, the water hyacinth is winning recognition as a rich resource—as mulch, as methane gas, even as cattle feed. In Egypt, however, where it proliferates, farmers still consider it a pest and are only too glad to get it under control.

Water hyacinths are a problem not only because they congest waterways and harbor disease-carrying insects, but because they waste water. Some 95 percent of the plant is water which is lost to the atmosphere through transpiration. In the Sudan it is estimated that water hyacinths are responsible for the loss of seven billion cubic meters of water a year—one-tenth the normal yield of the Nile.

Not nearly as ancient as the Nile, the plant was introduced into Cairo's Ezbekiya Gardens as an ornament at the turn of the century. At that time a French naturalist warned it would become a pest if the Egyptians weren't careful to keep it out of their waterways. They weren't and it did.

Agronomists, worried about the contaminating effects of chemical control, are now working with non-chemical ways of controlling the weed. Tools for better manual removal are being improved, and the designs of weeding machines streamlined for more efficient mechanical disposal. And the Ministry of Irrigation's Institute for Weed Control and Channel Maintenance has been experimenting with means of biological control. One such

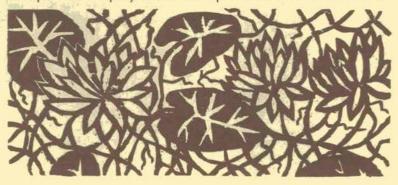
program (already underway in more than a score of countries as diverse as China, the U.S., Indonesia and Panama) recently went from the experimental to the implementative stage in Egypt.

The Egyptians are using a fish, the Grass Carp, to keep irrigation ditches and drainage canals clear. The carp are being introduced gradually throughout the country, and the preliminary results are encouraging. At the end of February two hundred carp were placed in one large canal, 4,000 meters long by 40 meters wide. In just two weeks time, the water level of the canal had increased by 40 centimeters, according to Ahmed Tolba, an engineer working with the carp project for the Ministry of Irrigation.

The fish offer several advantages. Not only do they eat water hyacinths, which are free-floating, but they also eat the more troublesome and harder to control underwater weeds. In addition, they are food.

The Grass Carp does not spawn naturally outside its native habitat, the Amur River in China, so there is no danger of fish overpopulation. This means, though, that they have to be bred in fisheries. One fishery in Ismailia is already operational. Work on a second begins in July.

The whole aquatic weed control program is being financed through a loan from the Netherlands, and a Dutch firm is helping to supervise the project and train personnel. MILAGROS ARDIN



Third World housing gets top priority at Nairobi meeting

NAIROBI—The first full-scale meeting of the United Nations Commission on Human Settlements brought together representatives of 65 countries. They decided their biggest effort should be in the Third World.

Dr. Arcot Ramachandran, of India, is executive director of the U.N. Center for Human Settlements (Habitat), the youngest of the U.N. agencies, with headquarters in Nairobi. Speaking after the Commission's two-week meeting, Ramachandran told *WER* that the Habitat work program, approved by the Commission, gives top priority to improving the poor housing conditions in which hundreds of millions of people now live.

The aim is to help individual governments transform low-grade housing areas by providing technical cooperation and research services, as well as to generate more money for this work.

Planning, management and land use programs are among

Recycling ...

THE HUMBLE EARTHWORM has been recruited in Taiwan's drive to combat pollution. The National Health administration announced that worms are being raised to devour the waste products of the paper industry and other industries using organic materials, which create a serious pollution problem. After the worms have grown fat on the effluent, they will then be eaten—by the fish and crustaceans that make up another viable industry in Taiwan. Foreign technology and investment are being sought by the paper-making industry to carry out the plan.

BRAZIL IS LOOKING BACK 40 YEARS to see if the "great ship of the sky," the blimp, can again become more than a curiosity.

A 15-month, \$260,000 "Dirigible Project" has been launched to study the blimp for passenger and cargo transportation, especially for cumbersome construction equipment to inaccessible destinations.

The difficult jungle regions of Brazil, like the Amazon, would be ideally served by blimp transportation where roads are non-existent or where their construction would be costly and detrimental to the environment.

AUSTRALIANS, usually unconcerned about energy conservation, are saving their old tin cans for recycling.

Alcoa of Australia received 616 tons of aluminum cans in the first quarter of 1979—more than double the amount returned in the same period last year.

The company pays 35¢ a kilogram for the cans, which are melted down and reprocessed into new can sheeting, thus saving 95 percent of the energy needed to produce new aluminum from ore.

IN CORK, IRELAND, the managing director of Atlas Oil Recyclers, F.M. Duffy, said that although his company provided a nationwide free collection service for waste oil, they were "blue in the face" from trying to persuade local authorities to establish collection facilities and thus avoid pollution. He thought the public should put more pressure on local authorities to provide collection points.

A government-appointed Inter-Departmental Environment Committee has underlined the importance of a national waste management policy, but this is still under consideration in the Department of Industry, Commerce and Energy. Some environmentalists feel that the government is not acting quickly enough.

Environmental Legislation...

THE SPANISH GOVERNMENT will present a General Law of the Environment to parliament before the end of the year. Public Works Minister Jesus Sanchez Rof said the law would cover five fundamental bases: awakening of public opinion, formation of experts, decentralization and coordination of existing environmental departments, and development of the new constitution's affirmation that all citizens have "the duty to preserve the environment," with the government establishing sanctions and clean-up laws for offenders.

THE SOUTH KOREAN government may submit a bill for establishing an office of environment to a special National Assembly session opening in July. It is currently being drafted.

Legislation is necessary to change the current government organization structure and to provide for the creation of the proposed office.

BOLIVIA has fully ratified the international agreement to preserve wildlife. The government signed a decree stressing Bolivia's determination to protect "by all means" both the human habitat and natural resources as "fundamental factors for human civilization." The so-called Convention (Agreement) of Washington was initially signed by Bolivia in late 1974; its primary aim is to control trade in endangered species.

A SURVEY carried out by the Environment Protection Commission of the Venezuelan Industrial Council concluded that 97 percent of Venezuela's industrialists favor "dynamic and flexible" enforcement of the Environment and Natural Resources Law.

Engineer Jose Gonzalez Agreda said the purpose of the survey was to obtain a definite commitment from industrialists to application of environment ordinances and laws. He said the wording of the laws can cause misunderstanding.

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The Center is a non-profit, non-advocacy, educational organization which seeks to foster public understanding of global environmental issues. Established in 1974 by the UN Association of the USA with the support of the UN Environment Program (UNEP), the Center alone is responsible for WFR's contents.

Habitat's activities. For instance, Habitat will help develop indigenous technologies and will ensure that techniques developed in one area are made available elsewhere.

He said support for the UN Housing and Human Settlements Foundation (UNHHSF) has been slow in materializing with few states contributing. But now that the Habitat work program has been approved, he expects much more support. Only about \$2.5 million has so far been contributed to UNHHSF, although the Habitat work program for the next two years totals \$13 million.

Habitat works with many international and national organizations—such as the UN Development program, the UN Fund for Population Activities, and the World Food Program—in developing housing and human settlements activities.

CHARLES HARRISON

Taiwan centralizes its environmental organization

TAIPEI—Taiwan's efforts to control pollution have received another boost with the formation of a new centralized organization, the Health and Environment Protection Administration. It replaces the National Health Administration which had a small and often neglected environmental protection unit.

According to Chuang Chin-yuan, its former head and now codirector of the new administration, reorganization will enable a unified approach to environmental problems. Previously environmental affairs were administered by the National Health Administration, the Ministry of Economic Affairs and the Interior Ministry, which resulted in conflicts of interest, overlapping and lack of coordination. The new administration will have full powers to enforce regulations on pollution controls for industry, already introduced, and for vehicles, due to come into effect in July.

Its first task will be to set up an island-wide monitoring system to discover how high air, water and noise pollution levels are. "Our present system only covers urban and industrial areas. Even in these areas, our knowledge is limited mainly to particle pollution. Noxious gas emissions have hardly been investigated," Mr. Chuang explained. Only after this survey, which will involve the immediate setting up of 20 monitoring stations, will the administration promote a comprehensive program of environmental protection.

Mr. Chuang admitted that a lack of skilled manpower is holding up the start of the program. But, he said, specialists will be recruited from Columbia University in New York to train qualified inspectors and other personnel and on-the-job training will be given. The new authority will also coordinate activities of local pollution control authorities, such as those run by city and county governments.

He will be helped in these efforts by the Industrial Development Bureau of the Ministry of Economic Affairs, which is also planning to provide loans to industry for the purpose. The bureau has asked several banks to provide cash for the fund, and urged the Ministry of Finance to reduce or abolish duty on imported pollution control facilities.

MICHAEL BOYDELL

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In This Issue...

The use and abuse of toxic substances has been increasing at a staggering rate over the last two or three decades. As explorer-scientist Thor Heyerdahl said in a recent WER interview: "In 1947, when we were on board Kon Tiki, it was fantastic how pure and clean and perfect the ocean was." But last year on his Tigris expedition he found pollution so thick the ocean was opaque. "We forget," he said, "that all the sewers from all the cities go either directly into the ocean or into the river and from there to the ocean." And so does runoff from fertilizers and pesticides, the untreated discharge from hundreds of thousands of factories, the tiny toxic particles that come down as acid rain or more directly as chemical sprays.

The richer nations are beginning to realize that it is more truly economic to handle pollution problems before they start, particularly when it comes to toxic substances. Cleaning up can be extremely costly. Less fortunate nations, although they may have laws on the books, tend to turn a blind eye to them when it comes to development. But, as the environment officials of nearly 60 nations agreed recently in Nairobi, development that doesn't take the environment into account may end up doing more harm than good.

They also agreed that no one knows enough about the handling and disposal of toxic wastes. In fact, to the best of our knowledge, no one had done a wideranging survey of how governments—north-south, east-west—are coping with the hazards of industrial and agricultural chemicals. WER's correspondents have. Their extensive reports covering more than 50 countries were pruned and polished by Michael Silvia, who also wrote the nuclear roundup that appeared January 1, 1979. This WER report on toxic substances is, we believe, the first world-wide survey of its kind ever made.

We are very grateful to W.R. Grace & Co. for making this expanded issue of World Environment Report possible. L.B.

Toxic chemicals

How more than 50 nations on five continents handle their most deadly pollutants

Thousands of new chemicals are developed every year. Many are potentially dangerous to life of all sorts. Other toxic substances are the unwanted by-products of industrial production. These poisons are buried in disintegrating drums or, more frequently, dumped directly into rivers and the sea. In addition, the use and all too often the misuse of highly toxic pesticides has spread rapidly all over the world.

Some steps are being taken to deal with these problems. European governments, which have more freedom to intervene for the public good, may be ahead of America in solving the toxic waste dilemma. Public facilities for the collection and safe disposal or treatment of toxic wastes have been established in many West European nations.

In other regions of the world, people are only now becoming aware of the hazards of industrial and agricultural chemicals. Some action is being taken to curb at least the most dangerous effects of chemical pollution. However, in many cases efforts only ameliorate the problem instead of eliminating it. For example, in India, when local residents complained about discharges of ammonia and arsenic from a fertilizer plant, the polluter was merely forced to build a pipeline to dump the wastes at sea—a "solution" used also in many developed countries.

In Latin America ...

Industry is expanding rapidly in Latin America and with it toxic chemical pollution. The growing petrochemical, steel, and mining industries discharge heavy metals and other toxic substances in increasingly larger quantities. Efforts to control industrial pollution are minimal since unfettered economic development has primary priority in most countries.

Pesticides such as DDT have long been used in Latin America since they were perceived as relatively cheap and effective, but their mismanagement has not only resulted in environmental damage but also in the ultimate damage—loss of life.

In Latin America ...

PERU, along with 13 other countries, has signed an agreement with a UN organization under which the Department of Environmental Health Standards in Lima will study the biological effects of mine tailings in water. The United Nations Environment Program is financing the study.

The head of the local health department, Luis Malnatti, says that Peru will do an analysis of river water polluted by cadmium, quartz and copper and study the effect on river water users.

Study of the Mantaro river is particularly significant for Lima since plans to divert the river to supply Lima with water are well advanced.

At the moment, there are 98 mines dumping tailings in rivers in Peru. On average, this amounts to some 154 million cubic meters of waste per month.

The other countries which have agreed to carry out similar studies are: Belgium, Greece, India, Iran, Israel, Japan, New Zealand, Poland, the Philippines, Sweden, Thailand, United States and Yugoslavia.

IN BRAZIL, WASHERWOMEN have traditionally rinsed their clothes in the waters of the Abaete Lagoon near the city of Salvador. Now they are being blamed for killing the fish in this historic voodoo site.

City health authorities reported that fish mortality at Abaete was a result of the cheap non-degradable soaps used by the washerwomen. The women blame the fish kill on the dumping of raw industrial sewage.

City authorities are considering setting up regular environmental supervision at Abaete and will start by distributing biodegradable laundry soap to the washerwomen.

VENEZUELA's Foundation for Environmental Education was two years' old this June.

Supported by the Ministries of Environment and Education, the Foundation spent \$670,000 last year for its activities, which included the publication of conservation posters, pamphlets on firefighting, tree planting, ecology and environmental law, and two children's books as well as a children's TV series on ecology, an adult TV series on "Environment and Development", and four 16-mm color documentaries directed to city councils and the general public on garbage problems and water pollution. Most recently, it distributed half a million litter bags to car owners and set up rubbish bins on beaches.

IN THE FULL STRIDE OF INDUSTRIAL DEVELOPMENT, MEXICO is stumbling over the problems of all poor countries. Industrialization has been achieved at any price to the environment. Awareness of the costs is just beginning.

The School of Chemical Sciences at the National Autonomous University of Mexico in Mexico City catalogued 6,800 industries in the Valley of Mexico. Of these, 3,100 are using materials that are flammable or explosive without established safe-handling standards, and 1,300 are sited dangerously near human dwellings. All in all, 80 percent of industry in the Valley of Mexico lacks minimum industrial safety or emergency plans.

This study was widely published in Mexico's major newspapers. Ten years ago the study would have not been made public, not for any political reason but simply because of a lack of interest in the government and among the people.

Outside of the capital, toxic chemicals are dumped in the water or on the ground despite regulations forbidding such practices. Not until a town or village is contaminated is there official recognition of the problem. Residents may complain for years but action is seldom taken until a major accident occurs.

This happened recently when chlorine gas was accidentally emitted from a Mexico City factory. Only after 1,500 people sickened did government officials examine the factory and discover that untrained workers were in charge of activating a system of vents.

IN CENTRAL AMERICA, which has little industrial development, the primary toxic hazard is the misuse of pesticides. From 1971 to 1976, 19,300 medically certified pesticide poisonings were reported in Central America, some 17,000 of those in El Salvador and Guatemala, or about 360 cases a year for each 100,000 people. By comparison, in the U.S. there are only about 100 poisonings a year per 60 million people. These figures are probably the tip of the iceberg since only acute exposures are reported.

Pesticide contamination of food has had an adverse economic impact. Central American beef consigned to the United States has been rejected due to excessive pesticide residues. In 1976, about 500,000 pounds of beef from El Salvador were rejected for levels of up to 95 parts per million (ppm) of DDT; the U.S. threshold level is 5ppm.

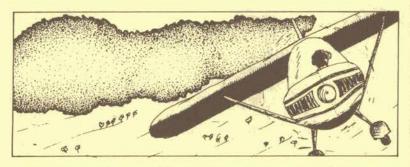
THE PRINCIPAL TOXIC CHEMICAL PROBLEM IN COLOMBIA is also pesticides. In 1978, Colombia consumed 17 million kilograms of pesticides, including DDT, aldrin and parathion. Among 683 pesticides on the market, 55 contain 2-4-D and 2-4-5-T, popularly known as agent orange, the defoliant used during the Vietnam War.

When the Colombian government banned the sale of the highly toxic Phosvel, or Leptophos, the American company Velsicol shipped its Colombian stocks to El Salvador, where such prohibitions do not exist.

The once pristine Bay of Cartagena on Columbia's Caribbean coast used to support a thriving fishing industry; now it is severely polluted by petrochemical firms. Of the 50 chemical and petrochemical companies located in the area, only one has installed an adequate system of filter controls. A soda plant,

opened in 1972, leaked large quantities of mercury into the bay and by the time the damage was discovered in 1977, the bay's sediment was encrusted with mercury. In one test 20 pounds of mercury were obtained from bay waters within a one-hour period.

No environmentally sound methods of waste disposal have been found or proposed in Colombia. Presently most toxic chemicals are dumped into the ocean, rivers and sewer systems.



IN VENEZUELA the petroleum industry, at least, is subject to very strict regulation and is closely controlled in all its activities from pumping to refining. Efforts are also being made to control emissions at the large government steel mill in Ciudad Guayana.

Disposal of toxic chemicals has traditionally been by direct discharge into rivers and the sea causing serious problems all over the country. For example, discharges of mercury from a seaside plant in Moron have led to serious health hazards for a local population dependent on a fish diet.

Protests about toxic industrial pollution are frequent, especially in new industrial centers such as Maracay, Valencia and in the oil fields. Environmental groups have been active but hampered by underfunding.

PERU has been lucky rather than far-sighted. Although it is a major mining nation, the volume of toxic substances that must be transported any distance is small. Almost all waste is 'conveniently' dumped in remote valleys in the high Andes.

The Cajamarquilla zinc refinery, currently under construction just outside Lima, is the most controversial environmental issue in Peru today. The project is going ahead despite loud public opposition.

SINCE 1975, BRAZIL'S FEDERAL ENVIRONMENTAL AGENCY (SEMA) has required all new industrial plants to comply with what it calls rigid regulations on pollution control. While SEMA does not have the power to reject a project, it can request state authorities to deny credit and other incentives to industries that do not comply. According to SEMA, most states are cooperating in this effort.

Factories that existed before the 1975 law must gradually install filters and other anti-pollution equipment, but SEMA admits it has been difficult to enforce compliance.

The most publicized pollution problems are in the big cities like Rio de Janeiro and Sao Paulo. SEMA spokesmen feel these problems can be eradicated. They are more concerned about the interior and the poverty-stricken northeast where mercury, toxic

More on Latin America . . .

TWO NATIONALIZED OIL COMPANIES, Petro-Canada and Petroleos Mexicanos, are exchanging environmental information, observing each other's techniques and strategies. It is, said S. Douglas Bowie, director of Petro-Canada's division of environmental and social affairs, "a two-way transfer of technology."

Petro-Canada emphasizes integrating the human and bio-physical environment in all its projects. Pemex lost about \$10 million in production because it ran into community resistance in Tabasco, so the Mexicans are going to study the Canadians' community liaison strategy. Bowie said oil companies are learning, "It makes good business sense to be sensitive to the people and their environment; otherwise you'll pay for it."

THE VENEZUELAN MINISTRY OF ENVI-RONMENT has completed a study on "rat pollution" in the rice center of Guarico State. Rats have caused a noticeable decrease in production over the last few seasons.

Of three rodent species identified, one is thoroughly adapted to aquatic life and is said to be the "principal enemy" of Venezuela's rice fields. The two others are less destructive and are labeled "potential plagues." The ministry said the study will be a starting point for developing rodent control without poisoning crops or polluting water.

Wild ducks, which eat the rice, are also a problem—easily solved when authorities lifted the ban on duck hunting.

A SMALL TOWN in the southernmost tip of Brazil has filed a suit against a company that is removing sand from Lagoa dos Patos, or Duck Lake

This ecological dispute between the Sul Minas company and the town of Tapes, located on the sand dunes surrounding Duck Lake, does not concern ducks at all, just sand. The company obtained a license to use the sand around the lake at a rate of 120,000 cubic meters a month to supply a glass plant it is building nearby.

"This will have grave ecological consequences," said Tapes mayor Armando Gross. "It will disrupt tourism and interrupt the livelihood of hundreds of people." He also said the company has obtained the right to order property owners around the sand dunes to "open up their land so that sand trucks can pass, thus damaging rice fields and cattle pastures."

Mayor Gross claims that Sul Minas is a subsidiary of a multinational company and says it is "a fraud to let foreigners exploit our natural resources."

Air Quality ...

COMMON PLANTS can be used to monitor air pollution in cities, according to studies conducted by India's National Botanical Research Institute in Lucknow.

The institute found that some plants react in characteristic and predictable ways when exposed to industrial and domestic pollutants even in low concentrations. Its research team studied plants growing near brick kilns and cement factories and discovered from their leaves that the frequency of epidermal cells and stomata was almost double those in other areas. It observed a direct relationship between levels of pollution and morphological changes in some fruit trees.

Admittedly, plant life can only serve as primary monitors of pollution. But in a poor country like India, this can save costs on expensive capital equipment which can be deployed in more critical locations.

THE KERALA GOVERNMENT in South India is going to study the incidence of chest diseases caused by air pollution from the state's major industries.

State Health Minister K. P. Prabhakaran said the state cannot take legal action against these industries since there is no air pollution law to punish them. The present law is limited only to water pollution.

He promised, however, to act against water polluters. The government has already ordered two textile plants closed.

TURKISH Deputy Prime Minister Faruk Sukan predicted "cleaner air for Ankara" in the years ahead. He said that an agreement was reached with the World Bank concerning a project to produce fuel without smoke. An initial \$4 million credit was obtained from the World Bank to draw up the project.

"But," Sukan added, "a drastic solution to the problem is considered for the long-term. The idea is to obtain gas from the coal (lignite) mines in Beypazari and Nallihan, in central Turkey, and adapt the central heating system in Ankara."

A MOBILE AIR MONITORING STATION has been ordered by the Research Center for Environmental Protection and Water Resources in Sofia, Bulgaria. It will be used to monitor sulphur dioxide, nitrogen oxide, carbon monoxide, dust and wind speed and direction, temperature, relative humidity and solar rediction.

The station will first be put into operation in the Black Sea area, but will be used throughout Bulgaria. fumes and industrial refuse are severely damaging the environment but where local authorities fear pollution control would discourage industrial development.

Between 1967 and 1975, at least 155 deaths and 1,682 illnesses were attributed to accidents in applying insecticides to cotton and soybean fields in southern Brazil.

Many buyers pay little attention to recommendations for proper use. A 1976 study in Rio Grande do Sul found that for each kilo of soybeans harvested, a half kilo of pesticides had been applied during cultivation.

THE GREATEST THREAT TO ARGENTINA'S ENVIRONMENT around Buenos Aires comes from the tanning industry.

Argentina is one of the world's largest leather producers with literally thousands of tanneries, and many are located along the rivers Plate and Parana and their branches in the area of Buenos Aires. Few tanneries bother to install water treatment facilities and thus raw chemical waste is dumped directly into the same water people drink, and in which they fish, swim and sail.

Though legislation against polluting Argentina's waterways does exist, some environmentalists consider it insufficient and enforcement is at best patchy.

In Europe ...

Efforts are being made in Europe to deal with the hazards of toxic chemicals. Legislation regulating their production and use, the establishment of safer disposal procedures and the creation of national waste recycling centers are all part of the movement to cope with these dangerous substances. In addition, studies and negotiations are taking place to standardize chemical regulation on a transnational and international basis.

THE BRITISH PUBLIC became aware of the problems of toxic waste disposal in the early 1970s after the national press reported a series of irresponsible dumping incidents. The only large-scale accident, in 1974, was at the Flixborough chemical plant where a hypro-gas explosion killed 28 people and caused environmental contamination.

Britain works on the principle of "polluter pays" and encourages industry and local authorities to cooperate in enforcing safety regulations.

Under the 1974 Control of Pollution Act, monitoring and control of toxics are mostly at the local level. When further sections of the Act take effect, each local authority will survey all waste produced in its area and arrange for its safe disposal.

Land fill is still the most used disposal method, but commercial chemical disposal plants are on the increase. Some take waste from abroad, though not without arousing public concern. For example, protests prevented importing the chemical Kepone from the United States last year for incineration at a plant in South Wales.

Generally, current pollution legislation is considered satisfactory—provided its conditions are observed.

IN SWEDEN a law requires every factory producing toxic wastes to report the amount, their composition and how they are being handled.

In addition, companies transporting chemical wastes must have a license to do so. This is an effort to stop irresponsible truckers from simply dumping dangerous wastes in forests or other isolated spots instead of driving to designated disposal plants.

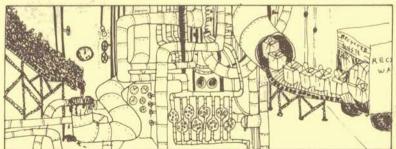
Disposal is handled primarily by SAKAB (Swedish Waste Conversion Company) which is 90 percent state owned. Some 20 private companies also have special permits to dispose of toxic chemicals.

Sweden handles disposal in three main approved ways: incineration (and efforts are being made to improve this method); chemical treatment coupled with a controlled land seal to prevent seepage into the soil and ground water; and recycling, which is the subject of continuing research for new techniques. Sweden does not dump toxics at sea.

IN NORWAY producers are responsible for the proper disposal of toxic wastes. They work with environmental authorities who collect the wastes and distribute them to commercial treatment plants. Within a year or two Norway feels it will be able to treat almost all its hazardous wastes. Norway currently uses the following disposal methods: chemical treatment, incineration, secure landfills, resource recovery and biological decomposition.

IN DENMARK, the pesticide and medical industries are the major sources of toxic chemical problems. But Denmark has been a pioneer in efforts to minimize toxic chemical pollution. As early as 1953 rules regulating pesticides were in force. Above-ground storage of all wastes is only permitted under stringent control. There is some ocean dumping, but direct discharge into streams and rivers or sewage systems is forbidden.

Chemical waste is collected by municipalities throughout Denmark for shipment to Kommunekemi at Nyborg where it is processed or recycled. Kommunekemi presently handles 50,000 tons of chemical waste a year and is expected to treat larger amounts of waste in the future.



THE NETHERLANDS recently introduced a new law setting rules for the disposal of chemical waste and waste oil. The new law requires all producers to deliver these wastes to a licensed disposer. The government is also giving high priority to a Dutch TOSCA (Toxic Substances Control Act), and a bill should be submitted to Parliament this year. Government approval will be

In Europe...

SWEDEN'S NATIONAL ENVIRONMENT PROTECTION AGENCY and the state's food department issued a new directive counselling against planting salad, spinach, cabbage and other leaf vegetables closer than 25 meters to roads carrying more than 3,000 cars a day. Root crops are excepted from the instruction. The objective is to reduce the amount of dangerous, even poisonous substances, such as lead from automobile exhausts, in the vegetables.

In 1978, the Food Department ordered that the highest permissible lead content in fresh fruit and vegetables sold in stores must not exceed 0.3 milligrams per kilo. Just recently the department reduced the level to 0.2 milligrams per kilo for children's food. Violations can mean a ban of the products from sale.

AN AMERICAN ELECTRONICS FIRM, Verbatim Corporation of Sunnyvale, California, is watching out for Irish fairies while building a new factory at Limerick.

Company founder and chairman, J. Reid Anderson, said the factory would be built so as not to interfere with a centuries-old traditional fairy fort on the site.

Fairy forts are raised mounds in fields and are usually found in the shape of a ring, or a fort. Irish tradition has it that to knock a "fairy fort" brings bad luck.

VILLAGERS AT HOGGESTON in Buckinghamshire, England, have inserted an extra prayer this year into their centuries-old Rogation Ceremony to bless and protect their land and crops during the growing season. The prayer is to preserve them against the building of a massive 5,000-acre third London airport, which would handle an estimated 50 million passengers a year.

Hoggeston is one of six possible sites proposed by a government study group in a preliminary report published May 18th. Five are near villages and farmland in the counties of Essex and Bucks. The sixth, Maplin, is an important bird sanctuary on the Essex coastal marshes.

Opposition to protect the environment is already being organized at every site. Moves to find a third airport site to relieve congestion at Heathrow and Gatwick began about 18 years ago.

The number of official enquiries already held have cost taxpayers several millions of dollars. Protesters, too, must start the protracted effort to raise funds to fight their case.

Energy Sources...

DOMICIO VELOSO, president of Brazil's National Industrial Confederation, suggested to the Minister of Mines and Energy, Cesar Cals, that their bilateral nuclear agreement with Germany be revised in favor of the development of a national alcohol industry.

Brazil is a country rich with natural resources, explained Veloso, and energy programs should be adapted to these resources.

In the previous 20 years, Brazil used 42 percent vegetal material and 37 percent petroleum for energy production. Today the figure has risen to 48 percent petroleum and fallen to 16 percent vegetal material, according to Veloso. He urged that the trend be reversed.

A strong defender of the national PROAL-COHOL (gasohol) program, he said that in July the Confederation will sponsor a seminar on the Brazilian Alcohol Program.

with Controversy RAGING about the ethics of drilling for oil on the Great Barrier Reef and with Queensland's 30 dry onshore wells, the state is launching an urgent study into the production of fuel-stretching ethanol from sugar cane and cassava crops.

Queensland Minister for Mines R. E. Camm announced the study only one day after the federal government opened tenders for five studies evaluating methanol as a gasoline extender.

Almost 95 percent of Australia's ethanol is manufactured by CSR Limited, the country's largest sugar producer.

at Sasol (the Transvaal's huge oil-from-coal complex), South Africa could become one of the first countries in the world to use hydrogen extensively in cars. This was said by Dr. Jeffrey Bindon of the University of Natal at an energy symposium at the Council for Scientific and Industrial Research in Pretoria.

Professor Richard Dutkiewicz, energy expert of the University of Cape Town, said it was a long-term solution because storage and preignition problems on cars adapted for hydrogen still had to be sorted out. He pleaded for more research funds and said oil-from-coal was the short-term solution for South Africa and ethanol was the most likely medium-term answer.

required for producing and marketing new chemicals.

In principle, the disposal of toxic waste on land or in the water is forbidden, but it is being done clandestinely. Meanwhile, after accidents that have mobilized public action groups, industries are working on recycling some wastes and on safer disposal and storage methods.

IN 1975, FRANCE passed a law that places responsibility for the safe disposal of dangerous waste on those who generate it. In addition, certain industries are required to install anti-pollution equipment. The ordinance calls also for the eventual establishment of a national agency responsible for the disposal and recycling of waste.

In the same year, 1975, France's largest chemical waste treatment center opened at Lemay. At full capacity, it is able to neutralize 150,000 tons of chemical waste a year into an inert brown sludge. This center is backed up by a number of facilities around the country that incinerate toxic wastes and treat waste oil. The French government incinerates chlorine residue on special ships in the North Sea.

By 1980 the government expects to have a national system of toxic waste collection to recover valuable material or to generate energy from waste incineration.

THE WEST GERMAN government is still discussing legislation for the control and disposal of hazardous substances.

There is an active interest in the environmental effects of the unchecked disposal of toxic substances, and clean-up steps are being taken. Perhaps the most heartening effort was taken this Spring when the Germans hosted a meeting of Rhine River nations to discuss what could be done to detoxify their mutual waterway.

Last year German papers were full of the election-time story that the firm Kali und Salz had agreed to dispose of the chemical Kepone for the Allied Chemical Corp. by storing it in salt mines in Hesse. Environmentalists were adamantly against storing American chemicals in Germany and so were some politicians, but it was a private transaction and now the Kepone that Allied had stored in Maryland and Virginia is in Hesse.

AUSTRIA has a geological structure that precludes land burial or deep-well injection. However, a special unit that deals with toxic waste and other difficult-to-dispose-of chemicals has solved most of Austria's disposal problems for the present. Located in Vienna, this plant is currently being expanded. A second plant is under construction in the heavy-industry area of Linz. Some toxic chemicals are transported by rail to the Netherlands where they are incinerated at sea. A third disposal method is to deposit chemical wastes in deep underground shafts in West Germany since Austria is geologically unsuitable.

Although there have been no major accidents, trucks carrying chemicals have crashed and there was a rail accident which threatened part of Vienna with evacuation because fumes from the train's cargo had seeped into the sewage system.

ITALY'S CHEMICAL WASTES are stored above ground or discharged into rivers and the sea after treatment. If highly dangerous, they are incinerated. Resource recovery is restricted to particularly valuable compounds.

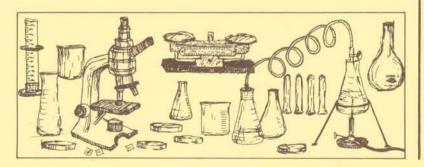
Future toxic waste control legislation probably will grant the 20 regional authorities power to organize waste processing and disposal as a taxed service for industry and local communities.

Italy's large industrial concerns decry the lack of government incentives for spending on toxic waste control. They say the prices of their products are becoming non-competitive because Italy is more restrictive than other EC countries about the discharge of toxic wastes into the rivers and sea.

SPAIN's relatively low level of industrialization means there is not much of a problem with toxic waste disposal. But when industry does dispose of wastes it generally pumps them into the air or pours them into rivers. Old, incomplete legislation is no deterrent. Spain's worst dumping problem is in its rivers since present fines are inadequate: 1,000 to 5,000 pesetas (\$14 to 70) for river dumping and 25,000 pesetas (\$357) for disposal at sea. A new and much stricter law replacing the current 100-year-old waterways law is expected to be approved this year.

BEFORE THE END OF THE YEAR, THE EUROPEAN COMMUNITY (EC) will write into law its equivalent of the U.S. Toxic Substances Control Act (TOSCA), ending a decade of work to harmonize legislation regulating chemical substances throughout the nine EC countries.

The legislation was proposed by the EC Commission in September of 1976 and sent to the Council for approval, now expected within six months. Approval has been slowed by difficulties in resolving technical differences among the EC nations. Approval could be delayed further if tough negotiations taking place between the U.S. and the EC on the implementation of TOSCA and corresponding Community legislation runs into snags. Specifically, the American Environmental Protection Agency now prefers a procedure for pre-market chemical testing that is different from the one agreed upon previously with the EC. The EC, nevertheless, is prepared to go ahead with writing the originally agreed-upon procedure, hoping that the U.S. and the EC will eventually recognize each other's legislation. If not, manufacturers on both sides of the Atlantic that wish to export their new products will have to submit to two testing procedures. rather than a unified one.



Nuclear Power...

SECURITY at South Africa's first nuclear power station—due to go into operation in 1982—will be the strictest in the world, says the Atomic Energy Board. The cylindrical chambers housing the two 900 megawatt reactors and their turbines rest on 490 concrete pillars. Shock absorbers on the pillars allow movement of up to 40 centimeters which will protect the reactor "against the heaviest earthquakes." Earthquakes have been recorded in the area of the power station, some 40 kilometers north of Cape Town.

AN ATOMIC POWER PLANT is to be built in the Ukraine at Khmelnitskiy. Signatories to the agreement are Czechoslovakia, Poland, Hungary and the Soviet Union.

The state-run Radio Prague has rejected Western arguments against power plants, saying that they are the only alternative for Czechoslovakia in the future.

SOUTH KOREA has decided to launch a joint uranium exploration and processing project with Gabon and Paraguay to fuel its nuclear power plants, Ministry of Energy and Resources officials said.

The officials said the government needs 8,774 tons of processed uranium by 1986 to meet the country's demand for nuclear fuel. The uranium projects in Gabon and Paraguay will cost about \$15 million. At present, South Korea has one nuclear power plant in operation and three more under construction. The government plans to build 46 nuclear power plants by the 1990s.

THE TAIWAN POWER CO. is taking steps to prevent environmental pollution from its thermal and nuclear power plants. Proposed measures include installation of testing equipment near all power plants to monitor air and hot water pollution and possible radiation leaks.

The state-owned electricity supply utility recently announced a plan to install three more nuclear power plants in addition to the one already completed and two under construction.

It also opened its first geothermal power plant in northeastern Taiwan recently. With an annual capacity of 400 kilowatts, the geothermal plant is the first of many planned for construction in volcanic regions on the island.

Renewable Energy...

THE CHINESE BEIJING REVIEW says a solarheated "bath train" is moving up and down a rail line in Xinjiang Uygur Autonomous Region "providing the line's workers with refreshing baths."

THE FIRST SOLAR-POWERED TELEPHONE was installed in Brunei recently. Eventually, about 50 of these solar power telephones should be in use in the country, Telecommunications Director Douglas Scholey said.

The solar cells give about two hours of continuous use of the phone daily.

TAIWAN, which depends on imported fuel for over 70 percent of its energy needs, is developing geothermal energy as a new source of energy

Taiwan's first plant, inaugurated last April in the Yilan region, is the Chinshui Geothermal Power Plant. It is generating about 210 kilowatts of power during this first stage although total installed capacity is 400 kilowatts. The government has decided to build a second geothermal power plant with a capacity of 300 kilowatts about 1 kilometer from the first. It should be completed by the end of this year.

A SUMMER RESORT ISLAND 18 kilometers off the coast of Western Australia near Perth is the novel setting for a wind turbine power-producing program.

Two turbines—one built in Canada, the other in West Germany—will be installed on adjacent hills on Rottnest Island and will supply about 10 percent of the island's annual electricity needs, at a cost of \$160,000.

A TINY AUSTRALIAN outback town will be one of the first communities in the world to be solar-powered.

The state of New South Wales will choose one of three possible towns to test an \$880,000 station that will provide solar power for at least 10 homes. Manned by a 15-person engineering physics squad from the Australian National University, this is the first practical test of the state's policy to provide 15-20 percent of its energy needs with solar energy by the year 2000.

The unit will take two years to build and install and should cut electricity costs up to 75 percent. It is estimated the system will provide electricity for about 7¢ per kilowatt-hour compared to the present diesel power plants now used in country towns which cost 10¢-30¢.

It will provide hot water, air conditioning, heating, and desalted ground water.

THE ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT (OECD) has launched a three-year Special Program on the Control of Chemicals. Its goal is to eventually coordinate regulations at the international level, for the OECD believes the disparity in national laws could lead to major economic distortions and the creation of non-tariff barriers to trade. This program will research, among other things, the development of consistent standards for laboratory testing and solutions to the confidentiality of data.

In Africa and the Middle East . . .

COUNTRIES IN TROPICAL AFRICA have few problems involving toxic chemicals because they have few industries producing these products, and those that do exist operate on a small scale.

The misuse of pesticides is not extensive since most farming is done by hand without the benefit of fertilizers or pesticides. The desire to use chemicals is increasing as local soils lose fertility and periodic pest outbreaks continue to destroy large portions of African crops. Data on the effects of pesticide use on humans and the environment in Africa are practically non-existent.

THE SOUTH AFRICAN Medical Research Council reported "evidence of the relatively high rate of occupational disease." Prof. Ian Webster gave what he called a "horrifying example": workers fired because of "drunkenness" were later found to be comatose from a degreasing agent used in a poorly ventilated room. Little is done to prevent occupational health hazards. Control is left in the hands of management, and what government regulation there is is divided among 12 government departments.

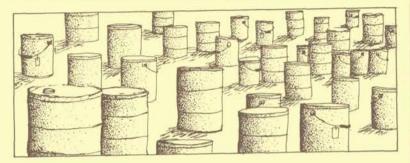
Per capita, South Africa is one of the world's largest users of pesticides. Although DDT, aldrin and dieldrin can no longer be sold in shops, they are still available in bulk for farmers. In 1977, 44 deaths occurred and 32 people were treated after handling agricultural chemicals. Most deaths were due to rural people eating freshly sprayed crops or using unwashed pesticide containers for drinking water or cooking.

The disposal of toxic wastes is handled by special firms which place the material in secure dumps, but in recent years there have been indications that some dumps are inadequate. Ocean dumping of toxic matter is illegal.

IN EGYPT, heavy industries both north and south of Cairo threaten the quality of air and agricultural land. To the south in Helwan, the air is often thick with emissions given off by cement and asbestos factories and the steel mills. North of Cairo, in Shubra el Kheima, 40 to 50 industries of all types use underground water for processing. This water is subsequently discharged into two major agricultural canals, introducing non-degradable substances into the soil Cairenes rely on for food.

During the early 1970s the massive use of the pesticide Leptophos on cotton caused widespread livestock loss and some human deaths. Egypt now has developed an integrated pest control program aimed at reducing the need for pesticides.

In the province of Fayum, south of Cairo, people routinely become temporarily ill after eating fish contaminated by a phosphorous compound introduced into its Nile-fed canals to kill mollusks that carry bilharzia. Residents are warned by loud-speaker not to eat fish for 24 hours after the poison is used; many don't listen and are ill for several hours.



THE EXTENT OF TOXIC CHEMICAL POLLUTION IN THE MIDDLE

EAST has not been adequately assessed. However, as the oil producing countries build up their refining capacity and other industries go on line, chemical pollution can be expected to increase. The extraction of minerals other than oil will also increase the potential risk of mine wastes contaminating already scarce water resources.

TURKEY'S GOLDEN HORN has been tarnished by toxic chemical wastes. The Horn is an extension of the Marmara Sea in Istanbul, and studies have shown that its fish have become contaminated. There also have been a few cases of human poisoning. The polluters are textile, chemical and plastics manufacturers. Toxic chemical problems in other areas such as Izmit Bay have been caused by pesticide manufacturing and the mining industry. Wastes are usually just dumped into nearby rivers or ocean waters.

Turkish environmentalists and some officials are beginning to perceive the seriousness of the problem, but the government has been ineffective in dealing with the matter.

In Asia ...

Concentrations of toxic substances are most prevalent in the more industrialized nations of Japan, South Korea and Taiwan. However, even partially industrialized countries such as India are plagued with toxic chemical problems.

In the rush to achieve self-sufficiency in food, pesticides and fertilizers have been used extensively. Unfortunately, little has been done to measure their accumulation in various bodies of water, in soil and on crops.

BY FAR THE WORST CASE OF CHEMICAL POLLUTION IN INDIA

in recent years was the release of effluent containing ammonia and arsenic from a big fertilizer plant in Goa on the west coast. Three months after the plant opened, thousands of fish were killed. A year later the contaminated water reached paddy fields,

Forestry ...

THE REAFFORESTATION PROGRAMS carried out over the last two years in Thailand have been a failure, said the Director General of the Forestry Department, Thanom Premrasmi.

Saplings planted over a 30,000-acre area in 1977 all died due to serious drought and those planted over 60,000 acres in 1978 have been 50 percent successful.

The government has 20 million saplings ready for planting in the country this year.

PHILIPPINE PRESIDENT Ferdinand Marcos has moved to accelerate the recovery of lost forests in the country by requiring loggers to increase their replanting areas.

Marcos has told all loggers to replant with the same species being cut. The logging sector should reforest 50,000 hectares this year. Failure to comply with the requirements will result in the suspension of the timber license.

NEARLY TWO ACRES OF MALAYSIAN tropical rain forest are being destroyed every minute, World Wildlife International Chairman Peter Scott warned.

"The Malaysian lowland rain forest has been described as the oldest in the world, evolving over a span of at least 130 million years, and it is terrifying to think that it will all be gone in a matter of a few years," Scott said. He said the World Wildlife Fund will help Malaysia formulate a national program to be part of the International Union for the Conservation of Nature and Natural Resources' plan of conservation.

Scott was in Malaysia to talk with the Malaysian Science, Technology and Environment Minister Tan Sri Ong Kee.

UNCONTROLLED LEVELING AND BURNING of the Amazon forest by multi-national and national agro-industrial projects appears to be continuing at a dangerously alarming pace.

Information gathered by NASA's LANDSAT satellite is now being studied by the Brazilian Institute of Forest Development with assistance from the National Institute of Special Research to determine the actual extent of the destruction.

Concurrently, strong political pressure recently led the Brazilian Senate to form a Parliamentary Commission of Inquiry to study the Amazon and its development policies.

The research team's technical spokesman, Rene Novaes, explained that the study will not be complete until the end of the year, but that destruction is extensive. One area of 10 million acres shows 28 percent destruction.

An area of 134 million acres will be studied, requiring 234 images. Thus far the study has analyzed only 31.

In Asia . . .

FOR THE FIRST TIME (to the best of WER's knowledge), a Third-World government has asked the major development agencies to coordinate efforts so as to control the negative environmental consequences of their projects.

Indonesia's Environment Minister, Dr. Emil Salim, asked the World Bank to help organize an environmental coordination workshop in Jakarta from June 6-8. Early reports following the meeting were that it was successful in harmonizing procedures. "It is a significant step forward and a real credit to all involved," said one participant.

Attending the workshop were: the Japanese International Cooperation Agency, Asian Development Bank, Export-Import Bank of Japan, Overseas Economic Cooperation Fund of Japan, US Agency for International Development, UN Development Program, Ford Foundation and the IBRD (World Bank).

SOUTH KOREA may soon establish a national office of environmental affairs in an effort to control environmental problems in the country. The move follows the enactment of an environmental preservation law and a "protect nature" campaign last year. At present, environmental matters are handled by a division of the Ministry of Health and Social Affairs.

CONSERVATIONISTS IN BOMBAY are protesting against a Tourism Development Corporation decision to build a crocodile and snake park in a forest reserve—the only green area near this over-congested city.

The corporation, which is owned by the Maharasthra state government, wants to copy the park started in Madras which has been drawing immense crowds. Authorities argue that the park will not only prove an attraction for visitors but also help preserve species (particularly the river crocodile) which are getting scarce. Besides, like the Madras park, they believe that this one can pay its way by selling snake venom and snake and crocodile skin.

Environmentalists point out that by removing another eight hectares from the national park, the corporation is depriving the citizens of a valuable asset. (Recently, a 150-hectare "film city" complete with massive studios for Bombay's burgeoning film industry, the world's largest, was built in the "reserve.")

The Bombay Natural History Society suggests the place for such creatures is in the wild where they can help preserve nature's balance.

coconut and mango groves and afflicted young children with severe rashes. The pollution caused a panic, the plant was temporarily closed by local authorities then allowed to reopen after a pipeline was built to carry the wastes to sea. The new pipe leaks and the area is still contaminated though much less than before.

Factory owners dump wastes with impunity. The primary offenders are fertilizer plants and petrochemical units. Disposal by burial is almost unheard of because anti-dumping laws are nearly non-existent and no owner is prepared to incur the extra expense.

The hazards of such dumping are only just beginning to scare inhabitants of cities like Bombay. Two recent surveys of the fish in Thane Creek near Bombay and plant and animal life in the surrounding area revealed alarming levels of mercury contamination.

IN LARGELY AGRICULTURAL BANGLADESH, the major sources of toxic chemical problems are those which help farm production—fertilizer and pesticides.

Increasing applications of fertilizer are affecting the spawning of fish in rice fields, and pesticides are killing the plankton on which fresh water fish feed, Fisheries Directorate researchers have found.

A bitter controversy raged recently over the aerial spraying of Malathion to kill mosquitoes in Dacca and its suburbs. Environmentalists and the newspapers contended it would be difficult to cover all food in wayside shops during spraying. It seemed the environmentalists had succeeded when authorities postponed the date of the spraying, but eventually the government sprayed Malathion over the city for seven days.

Toxic wastes from Bangladesh's small industrial sector are either buried or, more often, dumped into rivers. The Environment Pollution Control Board has monitoring stations in major industrial belts to determine the extent of toxic effluent in water systems.

Programs are being developed to use secure landfill and resource recovery systems as methods of waste disposal.

THE SRI LANKA GOVERNMENT has decided to strictly regulate the importation of Malathion. This is because the malaria mosquito is developing an increasing resistance to Malathion following its extensive use as a pesticide in agriculture.

The recent death from pesticide poisoning of a 21-year-old rice farmer in eastern Sri Lanka has focused national attention on the dangers of using pesticides without proper precautions. According to the local coroner, farmers often eat or drink while spraying pesticides and run the risk of poisoning themselves.

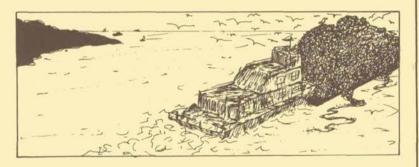
Consumers also are potential victims of pesticide poisoning. A Sri Lanka agricultural journal claims some vegetable traders encourage growers to spray pesticides on ripe produce to make it look fresher and keep better.

THE CHINESE GOVERNMENT began to carry out a nationwide campaign in the early 1970s to utilize the "three wastes"—gas, liquid and solid residue—by encouraging recycling of industrial wastes into beneficial substances. The petrochemical industry, for example, produced nitrogen and ammonia for fertilizer from waste water. Other enterprises recovered hundreds of products from their "three wastes."

However, the modernization drive of recent years has caused serious industrial pollution once again.

Recently, the Chinese government told 170 factories to install pollution control equipment or shut down. The government says it will provide funds and equipment for them to control industrial waste.

TOXIC EFFLUENTS IN THE STREAMS OF HONG KONG come mainly from the tanning and metal finishing industries. The effluents contain chromium, cyanide, lead and other toxic substances. There are no regulations controlling effluent pollution although the government is in the final stages of drafting a bill to regulate the disposal of toxic wastes.



IN 1975, THE SOUTH KOREAN government ordered about 1,000 polluting firms to improve their anti-pollution equipment, or move away from residential areas, or shut down because they were discharging heavy metals.

In 1978 the government enacted the Environment Preservation Law to control air and water pollution caused by rapid industrialization. Under the regulations, all factories that discharge harmful wastes are required to install facilities to prevent air and water pollution.

DUE TO ITS RAPID INDUSTRIALIZATION, JAPAN has the most serious toxic chemical pollution in Asia. A well-known incident was the Minamata mercury poisoning case. In 1976, the court ordered the Chisso Corp., which had dumped the mercury, to pay \$60,000 to each of 138 "Minamata disease" victims. In October 1978, the Japanese government established a national research center on "Minamata disease."

In 1975, eight employees of the Nippon Chemical Industrial Co. in Tokyo died of lung cancer after handling hexavalent chromium, a waste product produced in refining chromic salts. Also, more than 14 persons working in a chromium handling plant in Hokkaido died of lung cancer after prolonged inhalation of chromium dust. Although the government enacted a law in 1971 to control the disposal of industrial wastes, the chemical

More on Asia . . .

CLAM DIGGING is being banned in some areas of South Korea's Masan Bay beginning in June. The Masan area is the site of two large industrial complexes, and many factories are still under construction there. The ban on fisheries activities is due to the serious pollution in the area.

THE SOUTH KOREAN GOVERNMENT has decided to install 50 sets of automatic and semi-automatic air pollution measuring devices and six water pollution monitoring machines this year to reinforce the water and air pollution monitoring systems in the country. Total investment in the project will be 180 million won (\$370,000).

With the installation of the new equipment the number of air pollution monitoring devices in South Korea will be increased to 104 and 182 for automatic and semi-automatic machines respectively by the end of this year.

The Ministry will also install new laboratory equipment in the National Institute of Environment Research this year. At the same time, the government has decided to establish industrial waste water treatment terminals in 23 industrial sites by the end of the 1980's and sewage terminals in 36 cities by 1996.

INDIA AND THE USA have signed an agreement for collecting data during this year's monsoon experiment (MONEX-79) that should lead to improved understanding of the southwest monsoon.

The south-west monsoon rains are the most important natural resource on the Indian subcontinent. They come year after year and are, in a sense, inexhaustible—unlike other natural resources.

The agreement provides that three aircraft belonging respectively to the National Aeronautics and Space Administration (NASA), National Center for Atmospheric Research (NCAR) and National Oceanic and Atmospheric Administration (NOAA) of the USA will gather meteorological data during May and June principally over the oceanic areas around India. Indian scientists will accompany all research flight missions and become familiar with advanced technology.

Satellite pictures will also be received four times daily at Bombay from the geostationary satellite launched by USA over the equator at 60° F

Data gathered over tropical oceanic areas of the world during the two special observation periods of the Global Weather Experiment combined with the data obtained during MONEX-79 will enable meteorologists to study global aspects of the monsoon circulation.

Briefly...

JAPAN'S FIRST FULL-SCALE WILD BIRD sanctuary will open in October, 1980.

The 510-hectare sanctuary around Lake Utonai in southern Hokkaido, a project of the Wild Bird Society of Japan, will cost about \$1 million to construct.

CHINA has set up 43 natural conservation areas to protect wildlife in the country. Of the 15 rare species of wild cranes in the world, eight are found in China. China also has more than 1,200 kinds of birds, more than 400 kinds of mammals and various kinds of amphibians and reptiles, according to incomplete statistics. And about 100 species are on the verge of extinction.

THE PORTUGUESE GOVERNMENT has taken steps to preserve a natural bird sanctuary in the Tagus estuary, near Lisbon. The government has created a 20,000-hectare reserve area for this extraordinarily rich zone of silt, marsh and shallow waters, considered one of the four most important humid zones in Europe for migrating birds. Up to 100,000 species rest in this area in season.

The reserve will also have a center for studying biology and a lab for water and air sampling. The reserve lies near a large urban and industrial center and urgent measures will be needed to safeguard the area. A campaign for local and public support is underway.

AN INTERNATIONALLY RANKED ornithologist and leading New Zealand conservationist, Sir Robert Falla, died in Wellington, aged 77. Described as a conservationist before conservation and ecology became household words, Falla was as active in the field—leading expeditions—as he was chairing meetings such as the Royal Society of New Zealand of which he was a former president.

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companies still continue to dump chromium slag into the nearby waters.

In 1972, the Chemical Substances Examination Regulation Law was enacted, covering all chemical substances. At present, the Environment Agency is responsible for conducting surveys and research on chemical pollution at its environmental monitoring stations.

IN TAIWAN industrial wastes from petrochemical plants, steel mills and fertilizer factories are major sources of toxic chemical pollution.

In November 1978, air polluted by a chemical factory in Kaohsiung killed a woman worker, seriously poisoned her husband and two children and made more than 200 residents living in the area ill. The factory was releasing waste water containing hydrogen cyanide; the water evaporated and the cyanide spread throughout the surrounding area. According to authorities, the wastes released from the factory contained 500 parts per million—enough to kill. New air pollution standards have been established.

MOST INDUSTRIAL FIRMS IN THE PHILIPPINES dump their industrial wastes into nearby waters. For example, domestic, agricultural and industrial dumping has made Laguna de Bay, the biggest lake in Southeast Asia, a death trap for aquatic species.

The National Pollution Control Commission (NPCC) is making serious efforts to control pollution from industrial wastes and to prevent toxic chemical hazards. The NPCC regularly checks industrial plants and will consider ordering the closing of plants which pollute the environment.

The Philippine Fertilizer and Pesticide Authority has restricted the use of certain pesticides such as DDT, chlordane and dieldrin.

AT THE BEGINNING OF 1979 MALAYSIA set up new regulations to control effluents discharged by 5,000 factories in the country. The new standards post penalties for the discharge (over a specified concentration) of such toxic wastes as chromium and chlorine.

In Australia ...

There is no unified national approach to the monitoring or disposal of chemical waste in Australia. A recent report by scientists takes Australia to task for its lack of legislation to protect the land from pollution, although air and water pollution are well regulated. The report notes that unknown quantities of toxic wastes are being stockpiled. A national register of chemicals only now is being compiled.

The monitoring of agricultural chemicals is well-programmed. The manufacture of pesticides must first be approved by the federal government and then by each state. Some states have vetoed federally-approved pesticides.

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Brazil running thousands of vehicles on pure alcohol

RIO DE JANEIRO—Brazil has gone beyond gasohol. It is now selling pure alcohol in some gasoline stations, a decisive departure in this pioneering nation's search for alternative sources of energy.

Minister of Energy Cesar Cals announced that the alcohol will be sold from special pumps at 80 gas stations in four major Brazilian cities. With a fleet of almost 10,000 vehicles already fueled by pure alcohol, Brazil's plan to substitute mostly imported gasoline with homegrown alcohol is well advanced.

The nation has an integrated alcohol plan that covers everything from planting sugar cane—from which 99 percent of Brazil's alcohol now comes—to experimenting with other crops such as manioc and sorghum and new techniques in distilling right through building alcohol-fueled internal combustion engines.

The first step of this gasohol plan (the mixture of up to 20 percent alcohol in gasoline is gasohol) has been underway for the last three years. Although Brazil's alcohol production has been spiralling every year, there still is not enough to reach the 20 percent mixture. Last year the countrywide average was seven percent.

With a gasohol mixture of up to 20 percent alcohol, no changes are required in regular automobile engines. Beyond that, adaptation is necessary. For vehicles run entirely on alcohol, which is Brazil's ultimate goal, a different engine is required and Brazil is testing several types right now. The almost 10,000 vehicles now running on alcohol belong to various government departments, state and private institutions or companies like VW, GM, Ford, Fiat, or the CTA research institute.

The president of the Brazilian Institute of Sugar and Alcohol, Hugo Almeida, said 1979-80 cane alcohol yield should be 3.8 billion liters. One drawback of full-scale alcohol production is the fear that sugar prices will rise again on the world market and it will be more profitable to produce sugar. However, price rises are not likely in the near future. In the 1980s alcohol production from cane is expected to be greater than sugar production.

Some enthusiastic spokesmen for Brazil's alcohol program are looking to a 30 billion liter annual production of alcohol by the

Energy Sources...

SCIENTISTS FROM WARSAW TECHNICAL UNI-VERSITY have successfully tested a methanolgasoline mixture as car fuel, the Polish news agency PAP reported.

It said that tests were carried out on Polishmade cars without any alterations in engine

construction.

They tested a 20 percent mixture of methanol and a specially-purified gasoline. The scientists found it had the same energy value as traditional gas and caused no greater wear on the engine. Therefore, the report continued, this type of fuel could be introduced with no reservations.

The scientists reported on their tests at an international symposium on coal gasification and liquefaction held in Katowice.

AN ELECTRIC CAR designed in New Zealand could be in production by the end of next year. The first commercial users of it are expected to be electricity meter readers. It is planned for use in driving around hospital grounds, railway stations and warehouses.

Its inventors are a solar heating system manufacturer and two specialists, Kay Edge-cumbe and Colin Horsfall, who have four years experience in building electric vehicles.

Claimed to cost less than a conventional car, their vehicle will be a two-seater powered by two electric motors and six conventional lead acid batteries. The body is of aluminum, and each engine will drive one rear wheel.

RESEARCHERS at the Musashi Engineering University of Tokyo say they have developed a pollution-free car that uses liquid hydrogen.

Prof. Shoichi Furuhama of the International Combustion Engine Department of the university said the new car could become commercially feasible if the tank containers to hold liquid hydrogen could be mass produced. The tank container in the test vehicle held 60 liters of liquid hydrogen and cost \$7,500. This amount of liquid hydrogen covered only 300 kilometers which means the vehicle's mileage is about 11.8 miles per gallon. In contrast, an economy passenger car in Japan gets about 23 miles to the gallon of gasoline in heavy traffic.

THE KOREA NATIONAL HOUSING Corporation (KNHC) will install solar energy collectors in its new apartments.

Ministry of Construction officials said the KNHC will install the devices in flats in 37 cities in the country. The move is in line with the government's policy of developing solar energy and reducing dependency on fossil fuels.

mid 1980s, a ten-fold increase in less than a decade.

Brazil's rapidly expanding alcohol industry is now facing a series of perplexing production, marketing, ecological and political problems as it attempts to cope with massive production increases for an industry that only several years ago produced no more than a few million liters annually.

Brazil now spends more than \$4.5 billion a year for crude, which accounts for about 80 percent of its oil needs, and this uses up one-third of the country's export earnings. Substituting alcohol for gasoline relieves the epidemic dollar drain; however, a liter of alcohol brings a better price on the world market.

The former Minister of Mines and Energy, Shigeake Ueki, who is now president of Petrobras, told the unimpressed National Association of Automobile Manufacturers that alcohol should be given preference as an export because of its high international price. He estimated the market as 400 billion liters annually.

Jose Melo Telos, president of the National Council of Scientific and Technological Development, said he thought "alcohol is more important as a raw material for industry than it is as a fuel."

But for now the alcohol is needed at home for cars, trucks and

To give more support to the creation of cane plantations and distilleries, the government has changed its financial ground rules so as to make loans available for used equipment as well as new and "turnkey" operations.

GEORGE HAWRYLYSHYN

Venezuela's eco-chief says he will develop the Amazon area

CARACAS—Venezuela's new Environment Minister, Dr. Carlos Febres Pobeda, brings to his job an acute awareness of the ecological dangers threatening his country, of the agents responsible and of the critical ecological state of his home territory in the Andes.

The Environment Ministry—now two years old—is charged with managing 15 basic programs: forest reserves, parks, water basins and water supplies, aqueducts, sewage treatment, fire and flood control, environmental education and, he says, "the boldest task of all, a master land-use plan for the nation."

Dr. Febres, a lawyer and university professor says he will revitalize, with certain modifications, programs begun in the early 1970s to develop the Territorio Amazonas, more than 175,000 square kilometers of largely virgin forest in the south.

"It's quite clear: Conservation does not imply not felling trees, but rather knowing when and how to cut them," Dr. Febres says. "Conservation is the better administration of resources for the benefit of man. We do not attack the use, but rather the abuse, of natural resources."

The former governor of Merida State and an ex-deputy and senator, Dr. Febres earned a reputation for sound administration as president of the Corporation of the Andes, a regional

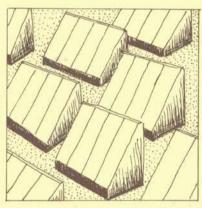
development body. In his 60 years, he says he has seen alarming ecological deterioration in the Andes: deforestation of the paramos for dairy farming, mountains eroded by bad farming methods, the poisoning of mountain rivers by runoff weed and pest killers, and by sewage and industrial pollution.

Dr. Febres plans to clean up Merida City's four rivers, beginning with sewers to collect wastes and culminating in riverside parks.

A government project to open a copper and zinc mine in Bailadores has been halted in view of environmental and social risks. The project called for removal of a village, part processing of ore and construction of a railroad to Maracaibo to ship out the minerals.

HILARY BRANCH
LILL STEINHEIL

Colombia installs world's biggest solar water heater



BOGOTA—Colombia's UN-supported appropriate technology foundation, Las Gaviotas, is installing the world's largest solar water heater at a 544-apartment complex in the city of Medellin. It costs \$300,000. Financed by the government housing bank, the complex will be inaugurated in September.

The heater is made of 3,000 square meters of burnt-out fluorescent tubing—a labor-intensive, low-capital product based on non-biodegradable material that would otherwise end up in city dumps. It heats water to 100 degrees Centigrade as it circulates through parallel lines of tubes connected by sealing rubber.

Las Gaviotas also mass produces a \$480 solar water heater system for six-person households.

Under study at Gaviotas' headquarters in the eastern plains, or "llanos," are solar water sterilizers, solar-powered iceboxes and solar-powered water pumps. Solar-powered equipment is viewed as a promising energy alternative in oil-hungry Colombia because of its location near the equator.

Founded in 1970, the non-profit foundation was singled out as the developing world's leading example of appropriate technology by the United Nations Development Program during last year's Buenos Aires conference on technical cooperation in the Third World. UNDP provided \$1 million for equipment, the Dutch government \$200,000 for building a factory on the llanos. Fifty Colombian scientists and technicians and some 100 farmers work at Gaviotas' 20,000-acre experimental settlement.

The llanos factory is mass producing cheap, durable agricultural and construction equipment that is easy to operate and maintain, with an emphasis on machinery driven by sun, wind and water.

PENNY LERNOUX

In Latin America ...

IN BRAZIL, the people of Guarulhos, led by their mayor, have revived protests against putting the new Sao Paulo airport in their municipality.

Mayor Nefi Tales said an airport in the Guarulhos suburb of Combica would turn the area into "a hell" for 70,000 residents, and he criticized the federal government for making a unilateral decision on the airport without consulting the people or local authorities.

Sao Paulo, the fastest growing city in South America with a regional population of 10 million, has two airports but both are working at capacity without expansion possibilities, so the city desperately needs a new airport. Now the Mayor of Guarulhos is saying that feasibility studies on the new airport were drawn too many years ago; since then many more people have settled in the area.

THE VENEZUELAN GUAYANA Corporation has announced the start-up of its Uverito pulp project, which will plant 180 million pines in the arid plains of Venezuela's South Eastern region.

IN CHILE, about 125 pilot whales ran aground on Navarion Island near Cape Horn. The whales, ranging from two to six meters in length, were found over a twenty-kilometer area.

A zoologist from Chile's Patagonia Institute said such an "ecological disaster has never before occurred in Chile in such magnitude." He said, however, that it is usual for members of this species to run aground.

Local experts suggested that the unusually large number of beached pilot whales this time might be due to middle ear problems caused by parasites or to a "collective suicide."

Discovery of the whales was made in March, but was not reported for a number of weeks.

BRAZIL HAS BEEN GRANTED two loans totalling \$157 million for water and sewage supply services.

A World Bank loan of \$100 million will be part of a \$303 million project to improve water services for a total of 5.3 million people. The balance will come from Brazil's National Housing Bank.

A \$57 million Inter-American Development Bank loan will help build an irrigation system in the agriculturally rich San Francisco Valley, site of an ambitious program to increase crop yields by 7 percent annually. The valley is estimated to have 6.7 million acres of irrigable land.

The Inter-American bank loan will supply 59 percent of the \$96.7 million project. The balance will be raised locally.

In Europe...

THE FIRST ALL-EUROPE parliamentary elections will be held June 7, and European Ecological Action (ECOROPA), an association of prominent environmentalists representing 14 European countries, has issued a 1500-word "Declaration for a Different Europe—Towards an Ecological Democracy." Signed by 800 Europeans prominent in science, politics, art and literature, the declaration asks their people to vote for ecologically engaged candidates. It was published as paid advertising in newspapers throughout the EC and translated into 7 languages.

ECOROPA has its headquarters in Geneva,

Switzerland.

SWEDISH ENVIRONMENTALISTS are putting politicians on the spot before the national elections this September.

The National Society for the Preservation of Nature has presented the five major political parties with questionnaires on environmental issues and requested replies on party positions.

"We don't want to point out any party as better or worse on environment questions," explained society chairman Bengt Hamdahl. "Voters themselves can compare after we receive the answers. We probably know some of the answers, but the parties now ought to be able to revise their ideas along a more friendly environment line."

Questions regarding local environment problems also are to be put to communal and provincial politicians by some of the 60,000 members of the society's 200 local units.

THE IRISH GOVERNMENT has allocated nearly £5 million (\$10 million) for environmental improvement schemes designed to employ young people under 25 at a time of high unemployment in the country.

LISBON HAS STARTED a major clean-up operation in a pilot zone covering about one-third of the city with new equipment—the first in years. Lisbon, "the jewel of the Atlantic," used to be known as one of the cleanest European cities, but in fact the city has never been organized for proper garbage collecting. Up till now, equipment purchases were zero as commercial and industrial waste increased to 800 tons daily. A project to enlarge the waste treatment center's present 500 ton-a-day capacity is now under study and the city council has launched educational programs on TV and in schools to encourage the Portuguese not to litter. The council plans to have two-thirds of the city covered by the new cleaning system by the end of 1979.

OECD calls for tough controls

PARIS—If overall environmental quality is to be improved, tough new control measures are needed. This conclusion was reached in an OECD report on the state of the environment. The report, the first of its kind, was presented to OECD environment ministers at their meeting here May 7-8.

On the encouraging side, the report found that public outcry for a better environment has significantly affected national policies. Environmentalism has been institutionalized in most countries. But as governments acted they found a much wider range of environmental threats. For example, the quality of fresh water has improved in many places with regard to suspended solids and biochemical oxygen demand. But pollution by "micro-pollutants" such as organic chemicals, heavy metals and organochlorine compounds is of increasing concern, particularly as they affect drinking water quality. And concentrations of nitrogen and phosphorus, which cause eutrophication, are increasing in many lakes and rivers.

Sulphur dioxide and particulate pollution of the air is

Economic and environmental goals compatible, OECD finds

PARIS—Good economic policy and environmental protection are not incompatible. This optimistic conclusion was expressed by the top environment officials of the most developed countries in the world. They met here for two days at an Organization for Economic Cooperation and Development meeting. Chairman Douglas M. Costle, chief of the U.S. Environmental Protection Agency, said the delegates felt strongly "that the time has come simply to refute the myth of a conflict between economics and the environment."

Several participants remarked privately about the optimistic tone of the meeting. France's environment minister, Michel d'Ornano, stated, "At this moment when our economies need all their resources if they are to remain competitive, action in favor of the environment may seem 'anti-economic.' In fact, environment policies make an effective contribution...in the industrial countries." Other nations' prepared statements echoed his remarks.

Environmental policies are changing from cleanup and repair to preventive "anticipatory" measures. Throughout their public statements, the ministers agreed to emphasize anticipatory policies—conservation of natural resources, land use planning and integrating environmental concerns into energy, transportation and economic policies.

Some nations argued for preventive measures as well, citing the costs of not regulating. "We can pollute ourselves into serious economic as well as environmental trouble if we fail to make wise

generally down. Success in controlling carbon monoxide, mainly from cars, has been mixed. The situation has improved in Japan, the U.S. and Canada where stringent auto emission standards have been mandated. In Europe, with the number of cars fast increasing, the report said it has been impossible to do anything but prevent conditions from worsening. Japan appears to be the only country which has decreased emissions of nitrogen oxides; elsewhere, emissions are up.

The loss of good farmland to urban sprawl, highways, airports and other infrastructural needs is worsening. In arid and semi-arid areas, erosion has accelerated. In response to these problems, governments have increased purchases of land for parks and wildlife refuges.

Noise is a major problem—it boosts blood pressure, heart rates and the amount of hormones in blood. In the last 15 years, noise in OECD countries has doubled.

Information about toxic chemicals was scant. An OECD project on their control is just beginning.

In general, the report highlighted the need for better and more systematic information.

J.H.D.

protective investments at the time they are called for," Costle told the ministers. He said the Love Canal hazardous waste dump cost \$25 million so far just to contain the damage and evacuate nearby families. The problem "could have been controlled years ago for \$2 million," he said.

The meeting also foreshadowed what may lie ahead on the international environment agenda. Two more nations—New Zealand and Yugoslavia, a special OECD member not counted in the 24—announced that they would join the OECD working group on control of toxic chemicals, bringing the number of countries involved to 18. Meanwhile, in its national statement, The Netherlands asked for international air quality standards and for an agreement on transport of hazardous materials, the cause of numerous accidents lately. Denmark requested international cooperation and an information exchange on materials recycling, and the U.S. suggested a new OECD project to develop an international hazardous substances exports policy.

JUDITH H. DOBRZYNSKI

UNEP meeting endorses integrated eco-planning

NAIROBI—Delegates from the UN Environment Program's 58 member nations recently finished a 17-day Governing Council meeting here that strongly endorsed the integration of environmental planning into the UN's new International Development Strategy. This strategy, which is already evolving, will be adopted at a special General Assembly meeting next year.

In Eastern Europe ...

STRINGENT ANTIPOLLUTION MEASURES have been highly successful in preventing degradation of the environment around the growing chemical industry center of Olaine in Soviet Latvia, Tass reports.

The Soviet news agency noted that the town's factories now turn out a variety of plastics, chemical reagents, medicines, agricultural chemicals and substances used in food processing.

However, due to extensive use of industrial air-purifying devices and other antipollution steps, the community's 15,000 residents can still "go to the forest to gather mushrooms and berries, have a swim and catch fish in the river," Tass said.

A ROMANIAN PULP AND PAPER FACTORY used to spend \$41,600 a year to truck its "waste" bark to a dump outside the city and burn it. But, as of this year, the bark is being used to power the pulp and paper plant. Nicolae Barbu, manager of the Letea factory in Bacau, told the Bucharest daily Scinteia, that they produce and use 40 tons of bark a day, which produces 10 tons of steam an hour at temperatures of over 200 Centigrade. He said the 15,000 tons of bark burned every year will be the equivalent of 4.3 nillion cubic meters of natural gas.

POLISH COMMUNIST PARTY head Edward Gierek flew to northeast Poland to look at the spring floods and called for river regulation to eliminate future floods.

Hundreds of thousands of acres of arable land and more than 200 villages in eastern and northeastern Poland have been flooded.

Poland has had poor grain harvests in the past several years and relied heavily on grain imports from the U.S. and the Soviet Union. The Government has been complaining that the increasing grain imports were very costly and represented a heavy burden for the country's foreign exchange earnings.

THE SOVIET MINISTRY OF AGRICULTURE is establishing a new Institute of Nature Protection and Preserves, Pravda reports. The Soviet Communist Party newspaper said the institute is being formed largely out of the ministry's preexisting Central Laboratory of Nature Protection.

One of the institute's main tasks, Pravda said, would be to develop environmental protection plans for the "territorial complexes" currently being built up to exploit natural resources in Siberia and the Soviet Far East.

Environmental Management . . .

THE NEW BRAZILIAN MINISTER OF HEALTH Castro Lima has announced a new plan to eradicate malaria and has offered his country's support for health schemes in developing nations.

"The Brazilian government is ready to actively cooperate with these governments in the improvement of the lives of their populations, because generally speaking the health and development programs in Brazil have similar climatic, geographic and social conditions," the minister said.

The minister claimed malaria had been eradicated in most parts of the country but remains in the sparsely populated jungles of the Amazon where the present program is to be concentrated. The minister also said that during his administration increased efforts will be made to eradicate or control the chagas disease and schistosomiasis.

A BIG MEAT EXPORTER like New Zealand must watch the effect of environmental chemicals on its meat. Pesticide and antibiotic levels have declined significantly, according to the country's Ministry of Agriculture. During last year, for instance, samples exceeding two parts per million of DDT fell from 25 to 13.

THE GOVERNMENT OF HONG KONG will build 17 sewage treatment and screening plants within the next three years to cope with the development and increase in population in the colony. Of the 17 plants planned, five are now under construction. These five plants will double the number of existing plants when completed at the end of 1981.

INDUSTRIES that pollute so much they are health hazards will be moved away from the Indian capital of Delhi. The city administration has asked officials to bring to the government's notice such industries they think are dangerous.

The Chief Executive Councillor, Madan Lal Khurana, told WER that there were 24,000 industries in residential and non-industrial areas, and they all would be moved out within five years.

The Delhi Administration is now taking preventive action to help citizens who cannot take legal action against the government. The Air Pollution Bill is still before Parliament, and unless it is passed no citizen can seek legal help.

Along with the Delhi Administration's efforts to check industrial air pollution, the Central Board for the Prevention and Control of Water Pollution has also warned "significant" polluting industries in Delhi they would need prior consent to discharge effluents into the Yamuna river that passes through Delhi.

To ensure ecological considerations in development strategy, UNEP is already preparing a world-wide cost-benefit analysis of environmental protection measures, from a number of case studies. UNEP also is gathering and analyzing data so that it can offer governments environmental guidelines for development projects. And it is trying to develop criteria for the rational use of natural resources.

In addition, UNEP member states strongly endorsed the formulation of a medium-term environmental plan for the entire UN system, meaning that all UN agencies, such as the FAO, UNESCO and WHO, would eventually be working within an integrated environmental plan.

Many UNEP environmental projects reported in the past by WER were discussed at the plenary meeting in Nairobi. UNEP Executive Director Mostafa K. Tolba announced a \$28 million shortfall in funding for the 1978-81 period—the target is \$150 million. But pledges of \$2 million came in during the Council meeting, and it was announced that 13 developing countries had pledged for the first time and that 21 countries had increased their pledges. At the time WER went to press, the U.S. cut of \$2 million looked like it might be restored.

Generally, a UNEP spokesman said, the participating governments endorsed the idea of progressive financial disengagement from projects funded by UNEP to get them going.

There was an attempt to shift the program from the global to the regional and national level as a way of getting more local benefits but, a participant said, since this is not UNEP's mandate, it did not go very far.

Finally, there was an endorsement in principle for the idea of a special UNEP meeting in 1982, a council of all nations 10 years after the founding Stockholm conference, at which UNEP's global state of the environment report will be ready.

SPECIAL TO WER

Philippine officialdom loses interest in eco-programs

MANILA—Ecologists in the Philippines were expecting great improvement in the country's rapidly deteriorating environment when, last year, the government's two environmental agencies were placed under the wing of First Lady Imelda Marcos. Mrs. Marcos, who is her 60-year-old husband's unofficial successor (wags call her the First Lady-in-Waiting), is one of the most powerful people in the country.

She has concerned herself with environmental issues ever since her husband appointed her governor of Metro Manila in 1976. One of her first successful acts in that capacity was the cleansing of the Pasig River, which is the major waterway draining this metropolis and flowing into Manila Bay.

In 1978, President Ferdinand Marcos appointed his wife Minister of Human Settlements—a ministry he created especially

for her. Its authority is so broad she is now able to organize her own political backing throughout the country.

Mrs. Marcos, with the help of an able staff of Western-trained technocrats, set up an eleven-fold program to oversee and organize all facets of life for the common Filipino. One of the eleven was environment. Accordingly, the National Pollution Control Commission (which had been under the Office of the President) and the National Environment Protection Council (which had been under the Ministry of Natural Resources) were both transferred to the Ministry of Human Settlements last year. The NPCC deals with pollution problems (mainly industrial), while the NEPC studies ways of solving problems. The NPCC is quasi-judicial and can fine polluters; in addition it sets the standards for clean air, water and noise pollution.

While its authority is clearcut enough, NPCC lacks the strength to do anything meaningful. Its budget is only around \$1 million a year, and its activities are generally limited to fining smoke-belching buses and factories. When it tries to get really tough on factories, it meets instant opposition from government agencies concerned with spurring the economy. And the important matter of mine tailings which silt up the irrigation canals of the farmlands in northern Luzon is not even under its jurisdiction. It was removed from NPCC by a Marcos decree which allows the mining companies to simply pay a tax on each ton of tailings poured into

the irrigation system.

The NEPC is also limited to a budget of less than \$1 million and a staff of 60. Probably its most important task is compiling an annual report to the President on the status of the environment. Sources on the Council say that previous reports have pinpointed the three most serious environmental problems in the country. These are: soil erosion caused by deforestation (an estimated 60 percent of all arable lands are damaged by erosion); water pollution (from industrial and mining wastes as well as agricultural chemicals); the loss of specialized habitats such as coral reefs (due to dynamite fishing, trawling, and coral export) and mangrove swamps (due to proliferation of fish pens in these areas). The Council has been unable to get government help on these problems because, as in most countries, the chief destroyers of the environment are big business which supports government. However, the Council has been able to get the government to set environmental standards for not-vet-operational projects such as the nuclear power plant, the copper smelter, and the reclamation of Manila Bay. The Council has also been able to get the government to impose requirements for environmental impact studies on new projects.

But the expected push on environmental issues by the First Lady has not materialized. Her staff says her main concern is housing, because housing projects are more visible than environmental changes. Her chief technocrat had earlier placed her name in contention for the UN's ecology award donated in the past by Iran. But it is not being given this year. And since the Philippines is dependent upon the goodwill of the new rulers of Iran for 20 percent of its oil needs, it is probable that Mrs. Marcos is no longer interested in any Pahlavi award. And this could be another reason why her enthusiasm for environmental matters has waned. As one

of her staffers says: "It's very sad."

BERNARD WIDEMAN

In Asia . . .

HONG KONG'S FIRST REFUSE COMPOSTING plant will be completed around June. The new plant represents a major step in the government's efforts to develop more environmentally acceptable means of disposing refuse. In the plant, solid waste gradually decomposes into hygienically safe, inert and inoffensive material. This method does not produce any atmospheric pollution and the composted wastes may be used as intermediate and final cover material.

HONG KONG is about to regulate the disposal of toxic wastes and to monitor air pollution.

The bills, according to Secretary for the Environment Derek Jones, will bring Hong Kong's safety measures in toxic waste disposal in line with those of industrialized countries.

AT A NATIONAL CONFERENCE on agricultural resources and regional planning, Chinese scientists urged the government to pass an environmental protection law to halt the destruction of the country's rare plants and animals.

CEMENT CAN BE MADE from the 15 million tons of rice husk available in India.

Industry Minister George Ferandes said that a private company in Karnataka State had already started producing this new variety of cement and the government would soon take this technology into rural areas.

LARGE-SCALE LAND RECLAMATION will begin in June on the west coast of South Korea.

Officials from the Ministry of Agriculture and Fisheries said that leading South Korean contractors will reclaim some 635,000 hectares of land in the Inchon and Kimpo areas of Kyonggido and in the Soesan areas of Chungchong Namdo.

THE SOUTH KOREAN capital city of Seoul is more polluted than Tokyo or any city in Western Europe, said a World Health Organization air pollution adviser, Dr. Wilfried Kreisel.

Dr. Kreisel said sulphur dioxide is the main air pollutant in Seoul because the government allows power plants, hotels and hospitals to burn oil with a high sulphur dioxide content—3.8 percent.

THE SOUTH KOREAN government has announced plans for developing its tidal power resources along the country's west coast.

The Ministry of Energy and Resources has decided to call for international bidding to select a technical contractor to undertake feasibility studies for setting up the country's first tidal power plant. The government wants to start construction of the plant next year and complete it by 1987.

Nuclear Power...

SINGAPORE Finance Minister Hon Sui Sen recently ruled out the possibility of developing nuclear power as an alternative source of energy for this island republic. Hon explained that the decision was due to the risks involved and the lack of a safe location.

Meanwhile, a three-man team from the United States visited Singapore to look into the potential uses of solar energy and possible joint ventures.

A PROMINENT BRAZILIAN PHYSICIST called the transfer of nuclear technology from Germany to Brazil a "joke" and warned that nuclear-derived electricity in Brazil is problematical.

Luis Pinguelli Rosa, secretary-general of the Brazilian Physicists Society, said that Brazil will have difficulties because of doubts as to the system's technical viability and because of opposition from the U.S. government and Brazilian scientists.

Rosa called the accord between NUCLEN and the German company, Kraft-Werk Union, which gives the Germans four votes on the board of directors and the Brazilians one, "a disgrace to the national dignity."

Nuclear electricity is now two to three times more expensive than hydroelectric power, he said, and is also an unnecessary security hazard for a country with extensive hydroelectric capacity and several viable energy alternatives.

THE AMERICAN NATIONAL ACADEMY OF SCIENCES is producing an important study, "Risks Associated with Nuclear Power: A Critical Review of the Literature."

A limited number of copies of the summary and synthesis chapter are available free from Robert E. Green, Executive Secretary, Committee on Science and Public Policy, National Academy of Sciences, 2101 Constitution Avenue, Washington, D.C. 20418.

Funding for the study came from the academy and the U.S. Department of Energy.

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U.S. nuclear probe results to be available through Infoterra

NEW YORK—Barbara Blum, deputy director of the U.S. Environmental Protection Agency, has announced that all information from U.S. investigations of the Three Mile Island nuclear accident will be made available to other countries through the UN Environment Program's Infoterra system.

Many nations are waiting to see what the citizens' commission investigating Three Mile Island comes up with. In Sweden, which has already had one government fall because of nuclear disagreements, at first it was suggested that a referendum on the nuclear question be held next Spring (after an autumn general election), but now it appears that all is in abeyance until the U.S. Commission completes its work.

In May, Swiss voters, obviously influenced by the Pennsylvania reactor leak, overwhelmingly (70 percent) approved measures aimed at tightening nuclear-energy controls. And just days before the Swiss vote, West Germany indefinitely postponed its plans to build a nuclear reprocessing plant in the Lower Saxony town of Gorleben.

The Organization for Economic Cooperation and Development, the rich-countries' club of 24, said it would study the Pennsylvania accident. European Community authorities dispatched observers to the site to report back, and Energy Commissioner Guido Brunner said, "It is bound to slow down our nuclear-energy programs...at least for a year." But, he added, given "Europe's resource situation, I can see little alternative to expanded nuclear energy if Europe wants to trigger a modest amount of economic growth in the future."



In France, Industry Minister Andre Giraud announced his government's decision to build nine new nuclear plants in the next five years: "It's either nuclear energy or economic recession."

But in Belgium, using extraordinary legal powers, the mayor of Huy ordered the closing of the nearby 870-megawatt Tihange nuclear power plant which had supplied up to 8 percent of the nation's energy needs (21 percent of Belgium's electricity was nuclear-generated).

A Philippine Atomic Energy Commission official seemed unperturbed about building that nation's first nuclear plant, saying that safety precautions were being observed. Plans for seven more nuclear plants have been scrapped, not because of Three Mile Island, but because nuclear power is too expensive for the Philippines (at \$1.2 billion, the Westinghouse plant is costing twice as much as originally estimated). Written by LIBBY BASSETT with reports from WER bureaus

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Britain's Ecology Party and Green Alliance gain strength

LONDON—Voters in Britain's May 3rd General Election heard more about environmental issues than ever before, for the Ecology Party (formed in 1973) fielded a record 52 candidates, a number which gave them the right to radio and television time for their campaign.

In addition, there is the Green Alliance (formed last October), which has been lobbying all major parties and being an information bridge on environmental issues to groups and institutions both inside Parliament and outside. Its members come from all the major environmental organizations: The Town and Country Planning Association, the Conservation Society, Friends of the Earth and the Council for the Protection of Rural England.

Both groups stress the need to challenge the philosophy of growth at any cost and the need to involve the individual more. Their only real difference is on political tactics. Their tactics seemed to work, for the major parties expressed concern for the environment in their manifestos. So even if the Ecology Party did not win a seat, and it was not expected to, its very existence achieved some of its objectives.

BARBARA MASSAM

In Spain, anti-nuclear parties are in power

MADRID—The strong gains made by leftwing parties in nationwide municipal elections—the first in 48 years—strengthened opposition to Spain's ambitious nuclear program. It is a program centered in the areas where socialists, communists and nationalists who oppose nuclear development now dominate city halls.

Eleven of 15 nuclear plants now being built or approved for construction lie in provinces where anti-nuclear parties lead municipalities. These provinces include, most importantly, the Ebro area of Eastern Catalonia which boasts Spain's greatest concentration of nuclear plants—four operating or under construction and three more scheduled for operation by 1985.

Also worrying for the government, which plans to supply 15 percent of its total energy needs with nuclear power, was the success in the April 3rd elections of Basque nationalists. Although the conservative Basque Nationalist Party is taking a cautious investigate-and-see attitude, far-left parties currently making big advances, emerged a strong second in most big Basque cities, and they support complete paralyzation of nuclear activity in the Basque provinces.

JULIE FLINT

Nuclear Power ...

ANTI-NUCLEAR CAMPAIGNERS in the Spanish Basque country will stage a week of protest and demonstration at Lemoniz, Spain's most controversial nuclear plant near the Basque city of Bilbao. At the same time authorities are stepping up anti-terrorist measures, trying to prevent a repetition of a bomb attack that took two lives at the Westinghouse-built plant a year and a half ago.

The left-wing organizers of the anti-nuclear week, called for May 21-27, are also planning a six-week "March on Lemoniz," to begin in July. It will pass through hundreds of Basque towns and villages in an effort to mobilize opposition to nuclear development in the Basque country.

The anti-nuclear campaigners are demanding immediate paralyzation of work at Lemoniz, a plant nearing completion, and abandonment of plans to construct three new plants at Tudela, Ea and Deva—all in the Basque provinces.

MEXICAN TECHNICIANS will carefully study data from the recent nuclear accident in the United States "to know whether it is applicable to Mexico," said Hugo Cervantes del Rio, director of the Federal Electricity Commission which is building Mexico's first nuclear plant at Laguna Verde, Veracruz.

At the same time, the director announced a loan in excess of \$600 million from the Bank of France to be used on the Laguna Verde project and two hydroelectric projects. The Laguna Verde nuclear electric facility is scheduled for completion in 1982.

"THE BIGGEST MULTILATERAL COOPERATIVE PROJECT in the world in this field," the European Community (EC) called it while approving a research and development program on radioactive waste management and storage. It will cost 53 million European Units of Account (about \$71.6 million) between 1980-84, nearly triple the amount allocated for the same program from 1975-79.

Compared with the 1975-79 program, greater emphasis will be placed on studying problems of low-activity waste, evaluation of the quality of conditioned waste and the construction of demonstration facilities, according to a spokesman at the EC.

In a related development, the EC approved a plutonium-safety research program worth 20 million European Units of Account (about \$27 million) for 1980-84, to assure "maximum safety in the use of plutonium as a nuclear fuel."

The quantity of plutonium recovered each year in the nine-nation EC is expected to rise from the present "several tons" to "some tens of tons" by 1980.

All-Europe environment meeting set for this autumn

GENEVA—A Soviet concession permitting the European Community to act as an entity has cleared the way for a high-level all-Europe meeting on protection of the environment this fall (see WER, May 7, p. 7).

The Communist group, supported by some non-aligned states, had asked that the East-West meeting approve, among other matters, a draft convention on combating trans-boundary air pollution.

The West demanded that the Community be granted a separate vote in any such convention in addition to the nine separate votes of the member states. But the Soviet Union and its allies do not recognize the EC as a political entity and have always rejected any moves to deal with the Community as a legally constituted bloc. Comecon does not act as a political unit with signatory powers.

Therefore, the compromise wording that permitted this agreement established significant political precedent, according to Western delegates. The wording refers to the "rights" of all signatories, including international organizations.

Their success in finding compromise wording means that the high-level meeting on the protection of the environment can now be held in November 1979.

WILLIAM G. MAHONEY



Dutch-German harbor expansion may harm nature reserves

THE HAGUE—Environmentalists in West Germany and The Netherlands have warned the governments of both countries that plans to expand harbor activities in the Ems estuary, in the north of Holland, could disrupt the environment along Europe's last disputed frontier.

For the past 300 years, the Dutch and the Germans have differed on where in the middle of the estuary the frontier lies. But now, since both nations want to deepen the estuary—the Germans to extend their existing harbor at Emden and the Dutch to construct facilities to handle increased imports of Algerian liquefied natural gas—border negotiations have reached a critical phase.

In either case, environmentalists contend that bird sanctuaries on both sides of the frontier will be threatened. An international law expert at a Dutch university has said that the West German plans are incompatible with the area's status as a nature preserve.

The Netherlands Second Chamber (lower parliament) is expected to vote soon here on a resolution condemning any

moves that would harm the environment along the frontier. The vote, which most political observers think will pass by a wide margin, will certainly have an impact on the delicate negotiations now underway between the two governments to define the frontier precisely. A spokesman for the Dutch Ministry of Foreign Affairs refused to comment on the negotiations except to say "the less said, the better."

Europe's Joint Research Center gets a \$726 million grant

BRUSSELS—A new four-year program worth about \$726 million has been approved for the European Community's Joint Research Center (JRC), a facility spread over four cities in the nine-nation EC. It carries out scientific research of a magnitude beyond that possible by individual Member States.

The 1980-83 program will attack such urgent problems as developing new forms of energy; at the same time it will intensify research on nuclear safety and environmental protection. The so-called SUPER-SARA project, underway since last fall, has involved an experiment on nuclear safety simulating the kind of accident that happened in Harrisburg, Pennsylvania, earlier this year.

The JRC also carries out extensive experiments on solar energy, thermonuclear fusion and hydrogen as a fuel (see WER, Sept. 11, 1978, p.1).

All JRC projects take into account the effects of toxic substances on the environment. The Center employs about 2260 people.

GARY YERKEY

Law of Sea Conference adjourns with some forward movement

GENEVA—The chairman of the six-year-long United Nations Law of the Sea Conference said that delegates meeting here had reached general agreement on combating ocean pollution.

Alexander Yankov of Bulgaria said that the wording of the new anti-pollution regulations is ready for a revised draft of a sea-law treaty which will be discussed in future sessions.

The present session adjourned here April 27th without reaching agreement on the major issues of deep sea mining and coastal water disputes (see WER, April 19, p. 7).

However, according to Yankov, the ocean pollution measures would make signatory states "responsible for the fulfillment of their international obligations concerning the protection and preservation of the marine environment." And he said, it would also make them liable for damage when their own organizations polluted the seas. This particular area of the accord would apply to oil tanker shipwrecks, and it would require governments to set up courts to render "fast and adequate" compensation for pollution of territorial waters.

WILLIAM G. MAHONEY

In Europe...

TWO TONS OF GARBAGE were exported to Sweden recently, scooped up from a garbage dump in New Jersey, containerized and aircargoed to Stockholm. The purpose was to see whether American and Swedish refuse were similar enough so that a Swedish resource recovery plant could recover the components of American refuse as well as it does Swedish. It turned out the two societies were similar, at least insofar as their leftovers are concerned. And the sales people at Flakt, Inc., expect to export their technology to the U.S.

FRANCE'S PRO-ENVIRONMENT PARTY, Europe-Ecologie, may boycott the elections June 10 for representatives to the European Community (EC) parliament—the world's first international popular elections.

The party, formed specifically to draw up a list of candidates nominated by environment organizations, says the boycott would be to protest a 1977 law that gives financial assistance to parties winning at least 5 percent of the vote. Europe-Ecologie says the law is designed to limit competition to France's four major parties.

But at a recent press conference in Paris, Europe-Ecologie spokesperson Laure Schneiter said the party hopes to raise covering funds or, preferably, to win at least 5 percent of the vote.

France will elect 81 representatives (out of 410 total for the nine EC nations) to the new European parliament, based in Strasbourg, France, and in Luxembourg.

RAZED BY NAZI BOMBERS, Rotterdam has been rebuilt to become Holland's second largest city (population 614,000) and Europe's busiest port. And it is gearing up to become something else—the finest city in the world for bicyclists. Plans recently drawn up by city planners call for the construction in the next five years of the most complete system of bicycle paths of any city anywhere, with costs for 1979 alone running to 12 million guilders (about \$6 million), three-quarters of it paid by the Dutch national government.

About 40,000 Rotterdammers already use bicycles each day. And for many decades, the Netherlands has had more bicycles per population than any other country on earth: two of every three Dutchman own bicycles, some 6.7 million bikes in all. The four billion miles that they pedal every year is a world record.

The new Rotterdam plan for bicyclists include other initiatives including improved public transportation (reducing the need for automobiles in the city center) and fewer parking lots. It also calls for the installation of more bicycle racks.

Water Quality ...

THE SWANS ON THE RIVER AVON in Shakespeare's birthplace, Stratford, are being killed by lead in their environment.

The largest source of lead came from angler's lead shot which the swans were swallowing, mistaking it for food or grit. It was causing chronic kidney disease, blindness, and affecting bone growth.

The Nature Conservancy Council is meeting the National Anglers' Council to discuss the problem, which extends to other rivers and other birds. As an immediate measure, anglers are being asked to take home their lead weights after fishing and not leave them at the water's edge. A long-term solution would be devising angler's weights of non-toxic materials.

JACQUES COUSTEAU, in Caracas recently to sign a contract with Venezuela, said in an interview that over the last 30 years commercial species of fish have been diminished by 40 percent due to submarine fishing techniques.

Cousteau and his team of researchers from the Oceanographic Institute of Monaco, which he directs, will spend 75 days in Venezuelan waters aboard his ship, the Calypso, beginning in June. Together with Venezuelan scientists, they will study the effects of commercial fishing in local waters in order to aid the government in the formation of medium-range policies for the rational exploitation of fishing from an ecological viewpoint.

"In facing this problem," he said, "we should not accept the principles of certain ecologists who wish to turn back; scientific and technical progress provides the only means for correcting

With Cousteau, Venezuela will co-produce a film showing the underwater action of different kinds of trawling nets.

A COLOMBIAN CHICKEN PRODUCER, Incubacion Ltda., was fined \$2,000 for dumping 80,000 live chicks in the Bogota River.

The act was illegal because it contributed to the contamination of the already severely polluted river.

Meanwhile, chicken producers in the western state of Antioquia were also reported considering drowning their chicks.

It was all due to a scarcity of chicken feed caused by a labor strike at the Purina plant, the country's principal producer. The government authorized the emergency importation of 50,000 tons of feed to solve the crisis.

SPECIAL REPORT:

Thor Heyerdahlon the state of our seas

NEW YORK—For 40 years Thor Heyerdahl has explored and studied the seas. Few men know our planet's oceans more intimately than this 64-year-old scientist and adventurer. And what he sees today makes him fear that as life began in the waters of this planet so may it end there—because we are killing the source of life, our oceans. WER talked with him about it.

"In 1947, when we were on board Kon Tiki, it was fantastic how pure and clean and perfect the ocean was. When I started the Ra expedition in 1969, I prepared my crew for the beauty of the ocean, the cleanliness of the ocean, and I got a shock myself."

"As soon as we woke up the first day at sea off Morocco, we found the water a great sheet of oil and full of oil clots. So we climbed the top of the mast because I was quite sure a ship had dumped it right there and then. But we didn't see any. So I sent my first message to the United Nations stating that the Atlantic Ocean was getting polluted. At that time that was incredible to almost everybody. Nobody thought an ocean could get polluted."

Since he is Norwegian, one might expect that Heyerdahl comes from a long line of sea captains, but no, he traced his family back 13 generations, and all were inland landowners. "I loved the forests and the mountains," he said. "I was really afraid of the sea. It was actually on board Kon Tiki that I got to love the sea and realize how fabulous the ocean can be."

And that was 10 years after his 1937 honeymoon expedition—a year on the lush south sea island of Fatu-Hiva studying ocean currents that might have brought South American flora and fauna across the Pacific. It was there he formed the then-iconoclastic theory that man too may have migrated with the currents. And so, the Kon Tiki, Ra and Tigris expeditions were born.

Ra 1 disintegrated just a week short of Barbados. Heyerdahl went back to Ethiopia, got more papyrus, built a better boat, Ra 2, and set sail again in 1970.

"Secretary-General U Thant of the United Nations asked me to do a day-by-day observation of what the water was like and to collect samples, and we did. And we found oil, solidified oil clots, 43 days out of the 57 it took to cross the Atlantic from Africa to Barbados. That was a shock to everybody.

"And when these oil clots were analyzed at the laboratory, it was found their composition was different from one to the other. These clots came from completely different parts of the world. Scientists concluded this represented the entire world fleet of tankers." And they had been borne across and around the Atlantic and to and from other oceans by the same currents that Heyerdahl drifted on to prove his theories of migration.

"On our last voyage across the Indian Ocean with the Tigris (made last year), the pollution was completely different. Because it is outside the Persian Gulf, I had expected it would be packed by oil clots, but it was not. There were areas which were absolutely horrible, black with big lumps or small ones, like rice."

But what Heyerdahl and his crew found was pollution they could not identify and at times so thick they couldn't see through it.

"Along the coast of Oman, for instance, we wanted to dive to film our anchor as we hoisted it, but we couldn't see it for the pollution. There were tiny white particles, like dissolved cardboard, enormous quantities of small fragments of plastics and other things drifting above on the surface and down below."

Because the big supertanker disasters focused attention on oil pollution, many believe it is the worst pollution problem. Heyerdahl thinks, "The real risk is not so much what the ships dump in; there are very few ships compared with cities in the world. We forget that all the sewers from all the cities go either directly into the ocean, or into the river and from there to the ocean. This is something we still ignore, and very little is done to stop that kind of pollution."

We act as though we are on a flat earth still, Heyerdahl believes. We dump our pollutants—our fertilizers, industrial wastes, pesticides and detergents—into the ocean and expect them to

disappear over the edge into nowhere.

"It is just a question of time before all this is going to be a very serious problem for the ocean. Having crossed the three main oceans in a primitive boat, I have one message that I really feel an urge to pass on to those who haven't seen the ocean as closely, and that is that the ocean is just a lake. You can sail in any direction and you'll hit land; the ocean is just a land-locked lake. And it is the heart that pumps life into this planet. Whether we believe in the story of creation as Christians, Muslims and Hebrews know it, or whether we subscribe to Darwin's theory of evolution, no matter, life started in this ocean. You cannot survive without it. It is a matter of breathing.



"I have a feeling that if we behave intelligently, maybe the common thread of global pollution will bring the nations together. It is one interest we all have in common. The oceans are rotating and what is African water one week is American water some weeks later and Asiatic water after that."

But so far, attempts at global regulation, such as a Law of the Sea, have been quite unsuccessful. Self-interest is still too strong.

Heyerdahl agrees: "There are already laws and regulations, some in existence for decades, but there is no policing of the whole thing. Each country ought to have stricter controls. It is not enough to forbid something and make the fine so small it pays to take the risk of, for instance, dumping oil. Many captains of oil tankers say it bluntly: It is so expensive to bring the sludge back ashore that they take the risk of paying the fine. The same is true of industry. I think that this is really the basic problem of the future, that is to see to it that we can produce and survive and still not destroy our environment."

Water wise ...

SEAWEED AND SHELLFISH FARMS in the coastal areas of Pusan, Masan and Ulsan in South Korea have been urged to close down their operations because the rivers are heavily polluted by heavy metals, including mercury and cadmium discharged from factories. The mercury content was up to 20 times higher than the permissible level, said researchers from the Pusan Fishery College, who had been testing the water since October.

RESEARCHERS at the Silliman University in the Philippines have conducted a study on the country's rivers and lakes and found that some 38 rivers in the Philippines are being polluted by industrial wastes. They comprise more than half of the 60 rivers that were studied.

According to survey results, the pollution ranged from suspended solids and degradable materials to toxic substances such as pesticides, heavy metals and radioactive substances. Major sources were mining operations, sugar mills, food processing plants, breweries and distilleries, and factories producing plastics, paper, detergents, and chemicals.

IN INDIA, the Jammu and Kashmir governments will spend about Rs 200 million (\$25 million) to save picturesque Dal Lake in the 1300-year-old city of Srinagar, which once boasted mansions that reached the clouds.

Experts from the United Kingdom and New Zealand recommended steps the states should take to revive the lake, which has been reduced to one-third of its size and is being polluted by tourism and lake shore residents.

The Ecology and Environment Board has decided to reforest the whole area and construct a settling basin to prevent the entry of sediments and silt into the lake. To insure the free flow of fresh water into the lake, it will divert water from nearby rivers.

THE DANUBE COMMITTEE ended its 37th session in Budapest with approval of its budget and an operational plan through March 1980.

Member delegations came from Austria, Bulgaria, Czechoslovakia, Hungary, Yugoslavia, Romania and the Soviet Union. Observers were representatives of the West German Ministry of Communications, the UN Economic Commission for Europe, the Comecon Secretariat, the World Meteorological Organization, the UN Environment Program and the International Labor Organization.

Topics discussed, according to the Hungarian news agency MTI, were: environmental protection of the Danube basin, navigational matters, radio communications, hydraulic technology and meteorology.

The next meeting will be held in March 1980

in Budapest.

Down under . . .

THE VICTORIAN GAS and Fuel Corporation in Melbourne, Australia, recently opened a liquid petroleum gas center and in its first week of operation, 520 orders for the conversion of cars to LPG were placed. Conversion costs approximately \$600 per car. Some 4,600 people have telephoned or visited the center since it opened, in part because the state of Victoria is considering imposing stricter car emission control standards. New South Wales and South Australia have already said they would proceed with tough new standards against federal government wishes.

TWO AUSTRALIAN STATES, New South Wales and South Australia, have decided to impose strict third-stage car emission standards despite an about-face by the federal government on the issue (see WER, April 23, p. 8). Legislation for the first two stages began in 1976, and is modeled after American controls.

At a meeting of the Transport Advisory Council in Sydney, federal officials urged state ministers to abandon the third stage after studying its implications: an increase of 5 percent or 900 million liters of gasoline used over the five years following implementation of this third and last stage in January 1981. But the two states decided to go ahead nevertheless.

Future car emission controls and standards will be discussed at a special meeting of the council in July this year.

FRIENDS OF THE EARTH and Greenpeace environmental groups in New Zealand celebrated May 3—international sun day—by distributing on main city streets 15,000 copies of a free newspaper, "Our Daily Sun," which featured their own concept of how the Prime Minister's house could be adapted to trap solar heat. May is the start of winter down under, and so the exercise was topical.

PENGUINS in the Antarctic have been found to be contaminated with small amounts of PCB (any group of chlorinated isomers of biphenyl), according to a Japanese expert who was a member of a 1976-77 Antarctic expedition.

Prof. Tatsuro Ashiyama of Hiroshima University Medical College said his findings were based on studies of the liver, fat, skin tissue and other parts of penguins he found dead in the Antarctic. He thought the PCB may have leaked from electronic equipment used in the polar region. He said .07 parts per million of PCB were found in the fat of penguins, and added that this amount is not dangerous.

Australians talk of drilling for oil on barrier reef

PERTH—The push is on again to drill for oil on Australia's Great Barrier Reef.

In 1970, public outrage stopped all exploration for oil in the reef area. And at that time the Royal Commission on the Great Barrier Reef was established.

But following the recent 14.5 percent OPEC oil price hike, Queensland Mines Minister R. E. Camm issued a statement suggesting it was justification for the resumption of drilling off the Queensland coast. He said Queensland's mineral fuel import bill had risen from \$30.6 million to \$125 million in four years. "Offshore oil drilling is going on throughout the world with no danger to marine life and I can see no possible reason for any objection to offshore exploration in this state," Camm stated.

Professor Frank Talbot, chairman of the Great Barrier Reef committee and director of the center for environmental studies at Macquarie University, said that Mr. Camm's statement of the effect of oil drilling on coral growth was disturbing. As reported in WER (Aug. 14, 1978, p. 1), \$11-12 million will be spent to study the effect of oil drilling on the reef.

The Federal Government, under the Seas and Submerged Lands Act, has the final say in the matter. Deputy Prime Minister Doug Anthony has firmly rejected any proposal for mining or oil drilling on the reef. The Royal Commission came to no conclusion about drilling off the reef.

JANE NACZYNSKI-PHILLIPS



Ghana's worst water shortage leads to fears of pollution

ACCRA—Ghana's capital is getting over the most prolonged and widespread water shortage anyone can remember. And there are fears that the nation's water supply may be polluted.

For many weeks, parts of Accra had received either murky drinking water or none at all. But when the crisis started February 26th, it hit almost the entire city, its suburbs and the neighboring industrial city of Tema. Work in hospitals, schools, the university and offices ground to a halt for more than a week, and people were obliged to collect water from any available source—stagnant pools, rivers and streams and sewage drains.

The cause was blocked pipelines between Tema and Kpong, site of a water pumping station and Ghana's second hydroelectric project. According to the Ghana Water & Sewerage Corporation,

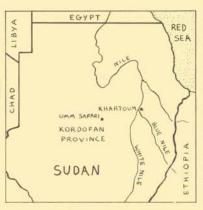
the pipes were lined with cement some 15 years ago to protect the iron casing from corrosion, but the lining had collapsed.

An Accra District Councillor complained that parts of the city had been without water for eight months without anything being done about it but, he said, when the affluent were affected their cry of injustice to "the masses" was heard at the Constituent Assembly.

The Water Corporation conceded it could not guarantee that all the cement mortar had been cleared from the entire 50-mile-long pipe. Meanwhile, the public has been assured that the "colored" water from the pipes is bacteriologically and chemically safe for human consumption.

Ghana's Environmental Protection Council is concerned: Water pollution is a very serious problem since only a small proportion of the population has access to safe and treated pipeborne water. Two of the most serious sources of water pollution in Ghana are the use of chemicals, such as DDT and dynamite, to catch fish and the discharge of factory wastes into rivers. Tata Brewery, which has, since its establishment in 1973, discharged its waste into the Odaw River in Accra thus "killing" it, last month discharged large quantities of beer declared unfit for human consumption into the same river.

Sudan studies solar- powered desalination plant



NAIROBI—Feasibility studies have started for the Sudan's first village-level solar power project—for the production of drinking water and alkaline salts at Umm Safari in North Kordofan Province.

At present, the nearest drinkable water is 48 kilometers away. The plan is to produce over 500 gallons of drinkable water daily from the highly saline—20 percent—waters of this area.

Local water is used to produce salt for the Sudanese nomads' animals. The salty water is evaporated over wood fires. This has depleted tree cover and encouraged desertification. Inhaling wood smoke may be causing lung diseases among the salt workers.

Studies by the Institute for Energy Research at Khartoum University have led to plans for a solar-powered water pumping and desalination plant, plus a new community center and housing project for the Umm Safari area.

When further feasibility studies are complete, finance will be sought. The European Community, West Germany and Canada have already shown interest in the project. CHARLES HARRISON

In Africa ...

EGYPT'S ACADEMY OF SCIENTIFIC RESEARCH and Technology and the U.S. Environmental Protection Agency have undertaken a number of joint projects to develop resources along the country's northwestern Mediterranean Coast. Edible plants and fruit trees adapted to desert conditions in the area will be planted, nurtured and studied. The project, with funding in the amount of \$900,000, will run four years.

IN SOUTH AFRICA the biggest problem the Kwa Zulu tribal area has is overgrazing. The Zulu regard cattle as wealth and although it is imperative to reduce stock because of massive soil erosion, no politician has the support needed to advocate such a move.

THE THREE MILE ISLAND incident triggered several newspaper editorials in South Africa calling for more caution over the nation's nuclear power program. They called for public assurances regarding safety measures, and some questioned the wisdom of siting the country's half-built three-reactor power station within 60 kilometers of Cape Town.

But The Star—a moderate English-language daily printed in Johannesburg—said since the Three Mile Island incident had been so traumatic and yet had caused no injuries, the public might have gained confidence in nuclear power rather than lost it. The tremendous publicity, accompanied by detailed layman's explanations of how reactors work, might also have dispelled some of the mystery surrounding nuclear stations, said the editorial.



SOUTH AFRICA has produced a special general-use postage stamp bearing the message "Save Fuel."

Meetings ...

JULY 8-13, 5th International Conference on Wind Engineering, sponsored by International Association for Wind Engineering, National Science Foundation and others, at Colorado State University. Contact: J.E. Cermak, Fluid Mechanics & Wind Engineering Program, CSU, Fort Collins, CO 80523, U.S.A.

SEPT. 10-11, Worldwide Environmental Problems of Toxic Substances, a conference sponsored by the Technical Information Project Inc., in Washington, D.C. Suggestions for papers are still being accepted. Contact: Thomas J. Conry, Project Manager, Technical Information Project Inc., 1346 Connecticut Ave., Suite 207, Washington, D.C. 20036, U.S.A.

SEPT. 23-39, Methods and Strategy for Integrated Development, an International Conference on the Environment, sponsored by the Foundation Universitaire Luxembourgeoise, the Belgian National Committee for the Man and Biosphere Program and UNESCO. Contact: Dr. Michel De Schrevel, Fondation Universitaire Luxembourgeoise, Rue des Deportes, 140, B 6700 Arlon, Belgium.

OCT. 15-17, Forestry Resources and Development in the Americas, sponsored by the Interciencia Association in San Jose, Costa Rica. Contact: Executive Secretary, Interciencia Association, American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington, D.C. 20005, U.S.A.

OCT. 22-26, International Conference on Energy Use Management, in Los Angeles, California, and sponsored by the U.S. Dept. of Energy, the University of Arizona and others. Contact: Craig B. Smith, ICEUM-II Cochairman, P.O. Box 64369, Los Angeles, CA 90064, U.S.A.

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Mexico is putting millions into reclaiming arid lands

MEXICO CITY—A dry tri-state area of northeast Mexico will be transformed into a two-crops-a-year region when the largest pumping plant in Latin America goes into operation soon. In a separate but related action, Mexico added \$155 million to its \$420 million, six-year project to aid the nation's arid zones.

When the first phase of the El Porvenir irrigation project is completed, farmers in the arid states of Tamaulipas, Veracruz and San Luis Potosi will benefit as 74.5 cubic meters of water a second soak into their fields. El Porvenir—in Spanish, The Future—is expected to irrigate 72,000 hectares of grain crops. It costs more than \$15 million.

By adding to the \$420 million already allocated by President Jose Lopez Portillo to his administration's program of reclamation and assistance to arid zones, additional projects can be undertaken for the six million Mexicans who live in marginal areas. Drinking water, sewage systems, road, electricity, agriculture programs and basic medical care and education will be available to more persons with the increase in funding. Other projects include desalination, drilling wells, livestock breeding, mining, forestry and introducing new crops and modern farming techniques.

KATHERINE.HATCH

U.S. and Chilean firms fund ecological study of Chile

SANTIAGO—Five Chilean and four foreign firms have contributed to a \$100,000 fund so that 15 scientists can produce an ecological history of Chile. The firms are hoping this will be seed money for a permanent, private scientific group which will act to balance economic development and environmental needs.

Environmental consciousness is low in Chile: There is only one moderately active private conservation group. The government attitude is reflected in this statement by a top national planner: "Rather than falling into an exaggerated environmental protection policy, logic dictates that the first step in protecting the environment is to eliminate extreme poverty."

The company-funded scientists, united in the Institute de Estudios y Publicaciones Juan Ignacio Molina, will spend 18 months developing studies on the country's biological, geographical, social and technological structures. This complete ecohistory is intended to provide the basis for future environmental studies and recommendations.

Funding the ecohistory are Goodyear, General Motors, Esso Chile and Disputada de Las Condes, a mining firm owned by EXXON. The Chilean participants are the Gabriela Mistral publishing house, the Pudahuel Mining Company, the Andina Bottling Company and two foundations: the Fundacion del Pacifico and the Fundacion BHC. The foundations belong to two of Chile's largest economic groups.

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Indian aborigines fight teak planters in Bihar

BOMBAY—"Teak has destroyed our life, so we must destroy the teak," says the adivasis, or aboriginal hill people, of south Bihar, one of India's most backward states. They have been cutting down trees in several teak plantations run by the state-owned Bihar Forest Corporation. According to Lalit Oraon, the Bihar forest minister, wood worth around \$6 million has been destroyed in the last couple of years.

The adivasis claim the teak plantations deprive them of their livelihood. Traditionally, they live off indigenous trees like sal and mohua, which provide fruit, seeds, leaves and herbal medicine. For two months a year, these tribals—who worship animist gods and are ostracised by Hindu society—live reasonably well during the harvest season. For the rest of the time, the forest must provide them with whatever they need.

Says a headman in one remote forest: "We are against any kind of plantation because it reduces us to laborers on the land over which we formerly had rights." Under laws laid down by the British, the adivasis (the word literally means aborigines) have hereditary rights to gather the produce of the forest. Now, they complain they cannot even gather twigs which they use to clean their teeth and grass for fodder for their animals. Teak has the "destructive" property of not letting anything grow in its shade, which is another reason why the adivasis are launching a campaign against it.

"The rain water turns yellow when it runs off the teak plantations," alleges the headman, implying that it is too polluted to use even for irrigation. Whether this is scientifically true or not, it shows how bitterly they resent the inroads made by the plantations. "Already, half the jungle has been cut down to make way for sagwan (teak) in some areas. What is more, wild elephants and boar have been driven out and they maraud our fields." They dare not shoot the animals: Under the state's wildlife protection rules, a man can get 12 years' imprisonment for killing an elephant and seven years for a boar.

The state government sees teak-growing as a "development project" for the tribals even though all the wood is cut and sold for use outside the forest area and even outside Bihar. It claims that teak has been planted for half a century and no one objected.

What government officials overlook is that it is only since 1973 that plantations have been cultivated in earnest. Besides, the tribals are only just getting organized. At least three violent clashes have taken place in the last six months, resulting in the deaths of some adivasis. The government has now posted special reserve police in forest areas which are "disturbed."

Forestry ...

A MASS SPRING AFFORESTATION DRIVE is now underway in China in response to a state call to extend forest cover across the country as quickly as possible, the New China News Agency said.

A drive is also underway to build a "great green wall" along the borders of China's largest desert, the Takla Makan in the Sinkiang Uighur Autonomous Region. By late March, the number of trees planted in five prefectures surrounding the desert rose by 30 percent to 100 percent over the same period last year.

In the sub-tropical Kwangsi Chuang Autonomous Region, 60,000 hectares of land have been reclaimed and 6,000 hectares of trees were planted. In Chekiang Province, 80,000 hectares of trees have been planted on mountain slopes, an increase of 40 percent over last year. All in all, 18 million trees have been planted along roadsides, river banks, around villages and houses and on plains in the country.

THE SOUTH KOREAN GOVERNMENT has announced its second 10-year afforestation plan to plant 3 billion saplings in an area of 3.71 million acres (1.5 million hectares). The plan will cost the government 1.48 trillion won (\$3.06 billion).

THE TINY HIMALAYAN STATE of Himachal Pradesh in north-west India has prohibited the cutting of trees or timber, as well as the removal of such wood outside the state, under its Land Preservation Act, which was introduced last year. One reason is the danger of huge landslides as well as its fear of flash floods, which ravage Himachal after every monsoon.

MANGROVES once covered more than 400,000 hectares of land in the Philippines; now they cover less than 200,000 hectares, and mangroves may vanish in the next five years if the present estimated deforestation rate of 24,000 hectares a year continues.

According to a recent Forest Research Institute (FORI) study on the country's mangrove resources, many of the mangrove areas have been turned into fishponds or other development projects.

A Mangrove Research Center has been established to look into both commercial exploitation and conservation. Mangrove swamps are natural sea walls and breeding places for fish and shrimps. Mangrove swamps also contain vital marine nutrients. They provide fuel wood, charcoal, tanbark and other forest products and contain chemicals useful in manufacturing rayons, dyes, pulp, alcohol and other synthetic products.

Recently it was reported that peasants in the southern state of Andhra Pradesh felled over a thousand rare *bursera* plants on a 200-hectare plot maintained by the local forest department. *Bursera* trees yield a valuable oil which is used as a perfume base.

Increasingly aboriginal tribals and peasants all over India are fighting forest projects started by state governments because they feel they do not benefit from them.

DARRYL D'MONTE



In Colombia, slash and burn cultivation called criminal

BOGOTA—A rash of forest fires, often started unintentionally by peasants and fanned by dry summer winds, has destroyed 20,000 hectares of woodlands in the Andean valleys south of Bogota and more than 500 hectares of La Macarena National Park.

Government investigations show that many fires were started by peasant families, either to clear land or to collect charcoal and wood for sale. Thousands of pine and eucalpytus plantations near the Colombian capital were destroyed as were corn, potato and other plantings and natural reserves protecting river basins.

The "slash-and-burn" method took its toll at La Macarena, which ecologists consider unique because it contains some of the oldest fossils in South America, a range of mountains pre-dating the Andes, and a remarkable variety of 12,000 species of plants and 2,500 species of animals, some of extreme rarity.

Agriculture Minister German Bula Hoyos described the forest destruction as "criminal." He warned that at the current rate of destruction around dams and lakes, Colombia will soon face a serious energy and water shortage.

The governor of the coffee-growing state of Caldas in western Colombia already has predicted a severe water shortage within two years. As a result of last year's international coffee boom, peasants have cleared some 50,500 hectares of mountain forests in the central range of the Andes in order to plant coffee. "Here in Caldas there is nothing left to protect," said an official of the Caldas Forestry corporation. He added that with the exception of the reserve guarding the waterworks of Caldas' capital at Manizales, there is not a single natural forest left in the state. A large number of rivers and streams have dried up, and those that have survived are contaminated by the highly toxic coffee pulp dumped in the rivers by the coffee plantations.

Some hope has been offered by the state government, which announced its intention to spend \$5 million on reforestation of river basins, and by the regional group, CRAMSA, which intends to invest \$20 million in reforestation.

Meanwhile, the Colombian Association of Lumber Industries is discussing a tax incentive program with the federal government for reforesting more than 35,000 hectares. PENNY LERNOUX

Huge areas of Venezuelan forests destroyed by fire

CARACAS—Fires continue to scourge large tracts of savanna and park land in the interior of Venezuela. Territory burnt so far in the Guavana shield region totals more than 150,000 hectares. The Environment Ministry has ordered the urgent delivery of two specially equipped fire-fighting airplanes from the U.S.

The rich tropical flora reserve of Henri Pittier National Park near the city of Maracay lost 50 hectares of vegetation despite the efforts of several fire-fighting groups from the Environment and Agriculture Ministries, civil defence and conservation societies. And thousands of hectares burned on the southern flatlands of the Gran Sabana, as well as in the more populated north-central states ELIANE DE STEINHEIL

HILARY BRANCH

Mexico's newest oil field to be ecologically developed

MEXICO CITY-It is a "first" in Mexico, a long-term plan to develop a huge new oil field and protect the environment. As recently as 1978, fields, towns and forests were being destroyed by the oil industry in its zeal to produce more petroleum.

President Jose Lopez Portillo and Jorge Diaz Serrano, director of Petroleos Mexicanos (Pemex), the government oil industry monopoly, have given details of their "new strategy" for Project Chicontepec, named for the town in Veracruz State where the oil field is located. Exploration and production will be in an underground oil channel which ranges under 7,400 square miles of rich farmland where oranges, bananas, tobacco, vanilla and palms are grown.

The oil potential is 106 billion barrels of crude-Mexico currently produces about 1.3 million barrels daily.

The Chicontepec area has been studied since 1960 by Pemex technicians, but only recently did they receive approval for further exploration.

Instead of drilling a well every 1,300 feet, as is customary, the 30 teams in the area are drilling every 5,200 feet, so as to cause less disturbance to the surface. They plan to pump only 100 barrels of oil a day from each well, thus minimizing the contamination at each well. Eventually, the project calls for 16,083 wells and 120 drilling teams in the area.

All of this is programmed by stages to happen gradually, over 13 years of development, so the region does not suffer the instant destruction that accompanies an overnight oil boom.

At the same time, Project Chicontepec oil exploration and drilling crews are being accompanied by agricultural experts to advise both Pemex and local farmers on the best methods for survival and enrichment of their crops. KATHERINE HATCH

More on Forestry . . .

NIGERIA is putting more than \$79 million into new forests-nearly 25,000 hectares of Gmelina, pine and eucalyptus—over the next five years. The money will also go to protecting and maintaining what forests Nigeria still has and toward making available newly cleared land for farmers. The comprehensive project will include money for management, monitoring, planning, training and the introduction of new technologies. Establishment and development of the project should take till 1984. Nigeria expects to realize hundreds of millions of dollars in foreign exchange savings by the end of the century. The project was prepared with help from the World Bank, which is giving a \$31 million loan for it, and the Food and Agriculture Organization.

A MAJOR FORESTRY PROJECT IN MALI will take place over the next five years. With a budget of \$9.4 million, its aim is to meet fuelwood and building pole requirements in urban areas. Its impact on the environment should be substantial: It should prevent the cutting of tens of thousands of hectares of bush fallow and thus prevent soil erosion and increase soil fertility. The World Bank is providing a credit of \$4.5 million, the French Caisse Centrale de Cooperation Economique \$1.4 million and the Fonds d'Aide et de Cooperation \$1.3 million.

BOLIVIA is setting up foundations to protect the nation's wildlife and forests. At the First National Meeting on Hunting, Fishing and Wildlife, held in April, a campaign to raise funds from the government and international organizations was begun.

Carlos Soria, an official of the Ministry of Agriculture which sponsored the meeting, said its purpose was to act to enforce protective legislation that was passed three years ago. "Our forests are shrinking and some species are threatened with extinction, yet illegal hunting cannot be stopped," he said.

TEN ORNAMENTAL PLANTS, shade and fruit trees grown in the Philippines have been identified by researchers as effective natural

aids in combating air pollution.

The 10 anti-air pollutant plants are: Gumamela (Hibiscus rosa-sinensis), chichitica (Lochnera rosea), San Francisco (Codiaeum variegatum), mahogany (Swietenia mahogani), narra (Pterocarpus indica), alibangban (Bauhinia sp.), anchoan dilaw, santol (Sandoricum koetjape Merr), ipil-ipil (Leucaena glauca Benth), maluko (Pisonia alba), and the castor bean (Ricinus communis L.).

The 10 plants can absorb the two most harmful pollutants in the air-sulphur dioxide

and nitrogen dioxide.

Energy ...

THE EUROPEAN COMMUNITY'S energy ministers have allocated \$131 million to develop 43 projects to demonstrate alternative sources of energy.

In addition, 40 projects to demonstrate energy saving were granted more than \$74 million by the ministers' council.

THE ESSO AND MOBIL OIL companies are planning to invest a total of \$7.9 million in energy-saving equipment in their Singapore refineries.

Esso's investment will be \$3.5 million for this year and Mobil's \$4.44 million to be spread over three years. For Esso, the additional equipment will mean a saving of about 250,000 barrels of fuel oil a year. Mobil will save 300,000 barrels when the facilities are completed by 1981. Esso has already committed \$7.15 million to fuel-saving facilities since 1974.



A WORLD PETROLEUM CONGRESS will be held in Bucharest, Romania.

Nicolar Pantilie, a member of the Secretariat of the Romanian Organizing Committee, said, "The 10th World Petroleum Congress acquires a particular significance now, when world consumption is growing steadily and oil reserves are dwindling." About 5,000 delegates from 70 countries are expected, he added.

Among the topics to be discussed is environmental protection of oil industry areas.

The Romanian said there would also be round table talks on more general matters, including petroleum supply and demand balances in the world, production of synthetic hydrocarbons from oil sand, oil shale and coal and new developments in the production of automobile fuels "in response of environmental and conservation requirements."

Romania is the second-largest European oil producer after the Soviet Union. It ranks third in the world in its oilfield equipment industry, behind the United States and the USSR.

The first World Oil Congress took place in 1933 in London. The latest was staged in 1975 in Tokyo.

Greece rations gas, bans cars to conserve fuel and energy

ATHENS—The Greek government is imposing a series of restrictive measures on fuel and energy consumption in an effort to drastically cut down imports of oil. In a parallel move, it increased gasoline prices 18 percent.

Greece imports all its oil, about nine million tons at an annual cost of nearly \$1.2 billion. Oil found off the northern shore of Greece is expected to produce 25,000 barrels of oil a day and the equivalent of 10,000 more in natural gas by the end of next year.

But for now restrictions range from fuel rationing for cars to closing airports at night. Rationing will be put into effect within the next three to four months; until then private cars are banned on alternate weekends according to odd- and even-numbered license plates. On the first weekend, 216 drivers paid fines ranging from \$210 to \$600. Maximum highway speed has been reduced to 80 kilometers an hour from 120.

Coupons will be issued next October for house-heating fuel, while strict inspections will be made in apartment houses to make sure that oil burners are functioning properly.

There are also plans to ban flights at certain airports from midnight to sunrise, a move which has the beneficial side effect of decreasing noise pollution.

Illuminated signs must be turned off, and industries must limit electricity consumption.

The government added that efforts to find more lignite and natural gas deposits would be intensified. Over 40 percent of the country's electricity needs are presently met by lignite (brown coal), with estimated deposits of 4.5 billion tons.

Finally, the government is considering using liquid natural gas instead of gasoline for taxis in major cities, to be extended to buses later if successful. Buses are considered responsible for much of the air pollution in the capital and other cities.

KYRIACOS CONDOULIS

Australia to mount massive energy cutting campaign

PERTH—A task force has recommended the Australian government spend \$17 million over the next five years in a campaign to cut energy consumption by as much as 20 percent.

Already \$50,000 has been spent preparing a "green paper," which noted that energy wastage was regarded by most Australians as a status symbol. And it found that the majority were not unduly concerned about energy conservation because of the country's large energy reserves in coal and uranium. Another \$40,000 will be spent in testing various kinds of advertising for their effectiveness on the public.

The campaign should begin in October, and up to \$3 million will be invested in it by the end of 1980, said Minister for National Development Kevin Newman. However, he does not think it will be necessary to spend quite as much as the \$17 million proposed by the consultants who engineered the survey for the government.

IANE NACZYNSKI-PHILLIPS

Swedes are pushing natural gas as best for the environment

STOCKHOLM—Sweden's National Environment Protection Agency (NEPA) is encouraging the government to support natural gas projects because they help reduce environmental damage.

In a report to the department of industry, NEPA emphasized that a fully developed natural gas system would reduce the discharge of sulphur by more than 30 percent and would burden the environment much less than both oil and coal. NEPA also noted that natural gas doesn't emit cadmium, chrome or nickel as do coal and oil.

NEPA wrote that the environmental advantages over oil or coal are so great that investment in natural gas "would be economically attractive" even though Sweden has no natural gas resources of its own. A company called Swedegas has advanced plans for piping natural gas to consumers in southern Sweden from West Germany via Denmark. It also has a contract with Algeria to ship in liquified natural gas to a pipeline terminal. In both instances, Swedish government approval still is needed.

One of the central themes in a government sponsored energy commission study was that Sweden must reduce its dependence on oil as quickly as possible. Around 76 percent of all Sweden's energy today is dependent on imported oil. SPECIAL TO WER

Germany's first eco-atlas given away in Bremen

BREMEN—The new bestseller here is an environmental atlas, West Germany's first, and perhaps the forerunner of an environmental map that may someday cover the entire country.

Published March 5, Umweltatlas, the brainchild of Bremen's Health Senator, Herbert Bruckner, shows the people of this northern city where traffic noise is worst, where they can still bathe in rivers and lakes and where bathing is banned, the location of containers for dumping old bottles and where the city has set up collection centers for used motor oil and other chemicals.

The facts were assembled over the past year by Senator Bruckner's staff, using reports submitted by city departments.

The initial press run was 40,000 (in a city of 588,000 inhabitants) and it is free.

Under Bruckner's tutelage, plans are already afoot for compiling an environment atlas for the entire northern region of West Germany. It is expected to take two years and to cost about 3.5 million German marks (about \$1.9 million).

GARY YERKEY

Renewable Energy...

THE NORWEGIAN GOVERNMENT this year allocated 30 million kroner (\$6 million) to support research and development of alternative energy.

So far the Petroleum and Energy Ministry has supported 30 different projects with 18.6 million kroner (\$3.7 million). There have been 80

applications for support.

Research projects involving wave energy top the list for support: Four projects got 13.6 million kroner (\$2.7 million). Norway expects to have an experimental wave-energy power plant in operation by 1980-1981.

THE SOUTH KOREAN GOVERNMENT has decided to construct three solar powered towns, in Changanpyong (on the eastern outskirts of Seoul), in Pusan, and at Hwasong (Kyonggi Province) by the year 2000.

FIVE GEOTHERMAL WELLS with a total capacity of 250 megawatts will be in operation in the Philippines later this year. The total power capacity will be pushed up to 750 megawatts by 1982, the National Power Corp. (NPC) announced.

Two geothermal wells, the 55-megawatt plant in Tiwi in Albay province and the 3,000-kilowatt well in Togonan in Leyte Province, are now in operation. Another 55-megawatt plant will be inaugurated in Tiwi this year and will be joined by two more in 1980 for a total power generation of 220 megawatts—enough to supply electricity to the entire southern Luzon area. Two other wells in the Bitin geothermal fields in Bay de Laguna are expected to provide an additional 110 megawatts to the area.

AUSTRIA IS JOINING the countries that are investing in systems to develop energy from natural and agricultural waste. Experts at the Chamber of Commerce for Agriculture have estimated that 500,000 tons of straw are burned annually on Austria's fields. If this was used as an energy source, it could save 170,000 tons of imported gasoline, an equivalent saving on Austria's trade balance of 300 million schillings (\$2.25 million). A straw-burning oven, the Austrians have calculated, pays for itself in terms of oil savings within two years. There are some 200 currently operating in the country.

At the Vienna Spring Fair the first system for the generation and use of bio-gas for individual farms was presented to the market. Each unit uses the dung of 20 cows as fuel and produces 20 cubic meters of biogas per day. Widespread use of biogas would cut back Austria's gasoline exports by 570,000 tons, a saving of some 17.5 million.

Environmental Investments...

THE UNITED STATES WANTS TO CUT its contribution to the United Nations Environment Program (UNEP), and five of the biggest environmental groups in America have asked the U.S. Senate to restore the money before it's too late. The Senators' decision will be made sometime this month.

For the past three years the U.S. has given UNEP \$10 million; for fiscal 1980 the proposed contribution is budgeted for \$8 million, a cut of 20 percent. The Natural Resources Defense Council, Friends of the Earth, National Audubon Society, Sierra Club and World Wildlife Fund-U.S.A., have jointly petitioned the Senate Foreign Operations Subcommittee to restore this funding since other nations may follow America's lead, and the world environment would be the loser.

At the same time, the five environmental groups asked the subcommittee to appropriate \$5 million for forestry projects to be carried out by the U.S. Agency for International Development in developing countries.

THE UNITED NATIONS ENVIRONMENT PROGRAM (UNEP) wants to end its financial contribution to the secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)—and is asking the member-states of the Convention to take over.

UNEP executive director Mostafa K. Tolba proposed that UNEP gradually reduce its financial contributions from 1980 onwards, with the aim of phasing them out completely by the end of 1982.

The Convention came into force in July 1975, and 50 governments have so far become parties to it.

WORLD ENVIRONMENT DAY is nearly here, June 5th, and the Environment Liaison Center, P.O. Box 72461, Nairobi, Kenya, is offering a "resource pack" for non-governmental organizations. It provides information for use by local papers and groups during this International Year of the Child. They are being distributed free in English, French and Spanish.

In addition, the United Nations Environment Program (UNEP) is distributing a media pack with articles and pictures relating to the major themes of World Environment Day. These packs are available from UNEP regional offices or: Mr. Bert Demmers, WED Project Manager, UNEP, P.O. Box 30552, Nairobi, Kenya; Information Officer, UNEP Liaison Office, Box 20, Alcoa Building, 866 UN Plaza, New York, N.Y. 10017, USA; or Information Center, UNEP Liaison Office, Palais des Nations, 1210 Geneva, Switzerland.

OECD environment ministers meet in Paris today

WASHINGTON—Five years ago, environment ministers from the 24 most developed nations met for the first time. Today and tomorrow they meet again—at the Organization for Economic Cooperation and Development in Paris. It is the OECD environment committee's second ministerial-level meeting.

The impact of environmental policy on economic conditions and how the world economy affects policy will be central to discussions by the 24 member nations. Within that context the delegations are set to discuss control of toxic substances, transportation, energy production and use, and urban development.

And, said James W. MacNeill, director of the OECD environment directorate, the ministers will hear disquieting news: Unless they maintain present environment policies, there could be a serious deterioration in environmental quality. There will be no improvement unless policies are strengthened.

Specific recommendations are expected. These include suggestions for coping with the expected increase in coal use, for mitigating the effects of mass tourism, and for building environmental impact assessments into planning, as required in the U.S.

OECD is expected to release its first international report on the state of the environment at this meeting, showing trends over the last 10 years. MacNeill said its preparation highlighted the serious lack of data on the environment.

By the end of the meeting, the nations' top environmental officials should have agreed on the direction future environmental policy will take. Their statement is expected to support policies to prevent environmental degradation rather than policies that react after the fact.

U.S. Environmental Protection Agency administrator Douglas M. Costle is chairing the meeting. Papers are available from OECD, Publications Office, 2 rue Andre-Pascal, 75775 Paris CEDEX 16, France.

JUDITH H. DOBRZYNSKI

Soviets charge EC is more environmental talk than action

MOSCOW—European Community (EC) efforts to develop a joint program against environmental pollution have been hamstrung by inadequate funding and "rivalry between monopolies," according to a Soviet political journal.

The monthly International Affairs noted that "although certain steps to protect the environment have been taken in West European states over the past 10 to 15 years, they can hardly be called satisfactory."

"The main reasons are the scant budget allocations and lack of interest on the part of private business," it said.

Echoing a familiar Soviet propaganda theme, the journal asserted that "the owners of monopolies, being most guilty of polluting the environment, consent to bear 'non-productive' expenses connected with nature conservation only as far as they do not affect the growth of their profits nor reduce, even temporarily, their competitiveness on the world market."

The article conceded that in recent years EC nations have agreed on various steps including conventions to help fight pollution in the Rhine and the Mediterranean. "At the same time, a number of measures and tasks envisaged by the EC programs still

remain mostly on paper," International Affairs said.

It stressed that genuinely effective measures could best be promoted by convening an East-West conference of all European countries to identify top priorities for joint action on environmental protection.

"Experience shows that efforts by individual countries, limited by national or even subregional margins, are insufficient for a whole number of ecological tasks," the Soviet journal said.

SPECIAL TO WER

East-West dispute stalls proposed world eco-congress

GENEVA—An East-West dispute has stalled approval of a projected World Environment Congress, forced the United Nations Economic Commission for Europe (ECE) to extend its annual session through the April 7-8 weekend, and finally to reschedule an extraordinary meeting on April 23.

The ECE provides a permanent and systematic means of economic cooperation for 34 UN members: 32 European states, Canada and the United States. As such it was charged by the Helsinki Accords with stimulating East-West cooperation and exchanges in a wide range of fields, including environment.

The high-level environment meeting was first proposed by the Soviet Union and backed by other East European states. Two previous ECE sessions authorized preliminary subcommittee and working party planning for such a congress. As this Commission session opened at the end of March, Eastern states wanted the World Environment Congress scheduled for 1979.

However, most Western nations felt more preliminary work had to be done. While agreeing in principle that a World Congress on Environment should be held, they insisted that details be worked out at lower levels before calling a high-level session.

Among the sticking points was Western insistence that the European Community participate as a bloc. The East refused to

accept Community participation as an entity.

Soviet delegate A.E. Nesterenko charged that "certain states" had attempted to link "political conditions" that were unacceptable to Socialist countries as a blocking and holding policy. "This is an awkward situation for the Commission and it set a negative precedent which cannot be erased," he said.

WILLIAM G. MAHONEY

Environmental Management...

INFOTERRA is the new name for the United Nations Environment Program's International Referral System (IRS)—the computer-linked "bank" of information on all aspects of the environment, (WER, June 20, 1977, p. 6)

For several months, partners in the IRS have been looking for a more suitable name. In the system's four working languages—English, French, Spanish and Russian—it was known as

IRS, SIR, SIC and MCC.

INFOTERRA has been adopted instead—and it remains the same in all four languages.

INFOTERRA, the world-wide environmental information network of the United Nations Environment Program (UNEP), held its first training course in India recently. Information specialists and development and planning officials from Ethiopia, Greece, India, Iraq, Lebanon, Nigeria and Zambia attended.

Ninety-six countries are members of the program. Environmental information located in 7000 sources under about 1000 broad headings is provided by 65 countries. A national directory of environmental information sources, identifying about 450 sources will be published in

India within a few weeks.

A UNESCO ENVIRONMENTAL EDUCATION CONFERENCE was held recently at the Kuwait Chamber of Commerce and Industry. It was sponsored by the National Committee of UNESCO Kuwait. Participants came from Jordan, Saudi Arabia, Syria, Iraq, Qatar, Libya, Egypt, and from ALESCO (Arab League Educational Scientific & Cultural Organization) and the Ministry of Education, Kuwait.

A WORLD COLLOQUIUM focusing upon major environmental problems that impact upon Third World development will be held in Vienna Aug. 20-31.

A UN spokesman said that the Vienna symposium will bring together some 200 of the world's leading scientists and specialists in

technology.

In the field of environment, the Colloquium will have before it working papers on the outcome of other meetings, such as a symposium to be held in May in Mexico on the integration of science and technology in the development planning process.

Subjects chosen for in-depth examination were: food and agriculture; health; human settlements and environment; population; natural resources; energy; transport; communication; industrialization; appropriate technology; and information systems in science and technology.

In Asia ...

THE JAPANESE ENVIRONMENT AGENCY announced new water pollution control measures to prevent further pollution of the Tokyo and Ise Bays and the Inland Sea. The new measures, which will be effective in June 1980, will restrict the volume and concentration of industrial pollutants discharged into those waters.

An estimated 10,000 industrial plants will be affected by the new measures. Each prefecture involved will set tolerable levels of pollutant discharges and will allocate these levels to each plant under their control. Plants planned or under construction will come under the new measures in June 1980 and existing plants in 1981.

FACTORIES IN SOUTH KOREA's largest industrial estate, Ulsan, have agreed to pay compensation to a group of farmers who suffered from industrial pollution.

The Ulsan Environmental Preservation Council, which is represented by 54 companies having plants in the province, has agreed to pay a total of \$624,000 to 160 farm families living near the industrial complex. The farmers had asked for \$2.3 million.

A STUDY OF TRAFFIC NOISE in Peking, Shanghai and Tientsin showed that noise pollution was worse in each case than in New York, London, Rome or Tokyo although the Chinese cities have fewer cars, trucks and planes, the New China News Agency reported.

THE GOVERNMENT OF INDIA has set up a National Pollution Study Center near Lucknow, the capital of Uttar Pradesh State. The industrial Toxicology Research Center, Lucknow, is in charge of this \$1 million project.

Dr. C.R. Krishnamurthy, director of the ecocenter, said that in another five years there will be a range of facilities to test under natural conditions the effects of toxic and persistent chemicals on animals, insects, plants, aquatic systems, soil and bacteria.

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Thailand's environment board has new legislative powers

BANGKOK—Thailand's National Environment Board (NEB) now has most of the powers and prerogatives it sought since it became an independent agency in the Office of the Prime Minister in 1975. New legislation (the National Environmental Quality Act, Number 2, 1978) requires many industries and government agencies to submit environmental impact studies, clarifies a range of pollution standards, and gives the government sweeping powers to declare and deal with environmental emergencies.

In a recent interview, the Board's Secretary-General Kasame Snidvongse hailed the legislation as "the most significant step taken to date to combat the increasingly widespread and dangerous destruction of Thailand's environment."

Environmental impact studies (EIS) have been made mandatory for public sector projects and for many projects undertaken by the private sector. A subsequent ministerial directive will specify the type and size of EIS that public agencies must undertake.

The second major sector of the bill clarifies pollution standards as well as plugging gaps in existing environmental legislation.

Stricter stream standards which emphasize the collective impact of industries dumping their treated and untreated effluent wastes are now under consideration. Ultimately, NEB's aim is to link the location of industries with the assimilative capacity of the local bodies of water to promote the rational as well as environmentally safe use of land.

The NEB is now responsible for setting up ambient air and vehicle emission standards and for other air standards not yet the responsibility of other regulatory agencies. NEB will also be responsible for interim and permanent noise standards. Mr. Kasame noted, "It will be two to three years before we can complete the necessary data collection and analysis to set up definite pollution standards; consequently, we will establish interim standards for the short term."

The potentially most far reaching provisions of the bill give the Prime Minister the power to declare an environmental emergency or to delegate this authority to provincial governors.

KENNETH D. SNIFFEN

Indian government sets up new environmental advisory group

NEW DELHI—The Government of India has set up a new committee on Environmental Planning and Coordination. Its purpose is to review policies and advise the government, public institutions and industry on the environmental repercussions of their activities and programs. It has been asked to review laws, advise on nature conservation and promote research in environmental problems.

The committee, which has a two-year term ending in 1981, consists of 36 members.

R. MURALI MANOHAR

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Brazil's Rio state launches \$300 million bay clean-up

RIO DE JANEIRO—The tourist who stands atop Sugar Loaf Mountain, seduced by the golden miles of Copacabana and Ipanema beaches and the blue Atlantic beyond, might find it hard to believe the truth as seen by an environmental reconnaissance

satellite high overhead.

Ondsat has been flashing back photographs of the Brazilian coastline every 18 days for the last three years. Experts at the Rio de Janeiro state environmental engineering agency and researchers at Brazil's National Space Research Institute have tied in this satellite data with ground measurements to find out just what is happening to the city's Guanabara Bay, the giant 400-square-kilometer natural harbor that first attracted early colonists to the spot. They have found that Brazil's "economic miracle" has ecologically unbalanced the bay.

A massive \$300 million recuperation program is being launched. The agency study shows that every day 14 tons of highly toxic wastes go into the landlocked bay. Of these, the daily diet of four tons of chrome and 177 kilograms of mercury are causing the greatest concern. The bay also receives 314 tons of organic material, 1,583 tons of waste in suspension, 3,000 tons of solid

garbage and 60,000 liters of oil every single day.

This substantial pollution infusion forms into what the scientists term "plumes," which are swept out through the bay's narrow mouth every couple of days by tidal action to wreak havoc on neighboring ocean coastlines. The plumes can be up to 90 miles long, 12 miles wide and 15 feet deep. Depending on the winds, they can reach as far as the Sao Paulo state coastline some 150 miles away.

Neither does the fact that there is a tidal cleansing action mean that the bay itself is kept relatively free from pollution. City officials recently posted a health warning about eating shellfish caught inside the bay and many of the inner beaches are declared

unfit for bathing.

There is also great concern about the inland Paraiba River, Rio state's main waterway, which carries alarming quantities of industrial waste products but which is nevertheless a primary source of drinking water for large numbers of the state's 12 million people.

To counter this mounting environmental threat, the state agency has instituted what it believes to be the most advanced set of pollution control regulations in the country. Basic standards in Brazil are set by the federal government for state implementation, but most states operate their own systems. The main weapon in

In Latin America ...

PAULO NOGUEIRA NETO, the head of the Brazilian Environmental Agency SEMA, said he was in favor of a campaign to defend the Amazon. But he qualified this by saying it should not be a political movement. He also stressed that "the Amazon should not be left untouched, but its occupation and exploitation should be done in a rational manner and by Brazilians.

The campaign in defense of the Amazon is being organized by groups of conservationists and intellectuals as a result of the controversial hand-out of big lumber concessions.

The head of SEMA said the Brazilian people are now ecologically aware enough to understand the importance of a movement to conserve the jungle.

THE BIOLOGICAL INSTITUTE at the University of Concepcion, Chile, will host in September an international scientific workshop on methods of detecting environmental carcinogens and mutagens. Participating in the ten-day workshop will be scientists and specialized personnel from Mexico, West Germany, Uruguay, Chile and the United States.

THE PERUVIAN GOVERNMENT proposes to downgrade the status of the vicuna, currently classed as a highly endangered species, according to Felipe Benavides, president of the World Wildlife Fund in Peru.

During the past 10 years, the vicuna population has swollen from a scant 600-plus to over 35,000. This has been largely due to the heavy penalties imposed by Peruvian law on those found guilty of killing vicuna and also to the creation of an official reserve in Ayacucho in the Andes.

However, communications between officials in Lima, supervisers in Ayacucho and conservationists everywhere has led to confusion. In the reserve, managers want to slaughter 5,000 males for culling purposes and to transfer another 5,000. This has been attacked by conservationists in Lima who say that supervisers should have anticipated such a whopping imbalance and taken steps to avoid such drastic

And in Lima, the ministry of agriculture is talking of "industrializing" vicuna since it believes there are enough. Felipe Benavides, however, says that any move to downgrade the vicuna status would be "mad, atrocious and criminal. We need another five years of a moratorium in vicuna. Otherwise, the entire vicuna population will be wiped out in three years.

Rio's armory is a new licensing system for potential polluting industries. Known as S.L.A.P., the system uses a three-stage control which has been worked out in consultation with local industry representatives.

• Stage one requires any company intending to set up a potentially polluting operation to apply for an initial license. It begins the hand-in-hand process between the company and the agency and spells out the general conditions which the company's installation will be required to meet. This stage one license is also a prerequisite for the generous state loans available to cover antipollution equipment costs.

• The second stage requires full details of production plans, emission controls, etc., and involves an undertaking on the part of the company to stick to the specifications it has lodged with the state. It is an offense to construct any potentially polluting plant without this second stage go-ahead. The company is obliged to give the state agency whatever information it may require to assess the project.

• Once the plant is constructed the operator must apply for a stage three operational license. The agency envisages following this up with regular visits changing to spot checks once the plant

has overcome any teething problems.

The operational license is also to be required for polluting plants constructed prior to the introduction of the new S.L.A.P. control system. "But," said agency officials, "there will be a period of grace to allow companies with older plants to modify their operations to meet our specifications. And loans may be available.'

The three licenses have validities of three, six, and 10 years respectively, and the project includes fines to a maximum of some \$15,000 per day. "We want these fines to be only a last resort," said an agency spokesman. "It's much more effective to work with polluters, to educate them and to solve the problems in that way."

SPECIAL TO WER

Peru's new constitution has conservation section

LIMA—Peru's draft constitution includes a natural resources section that recommends rational exploitation of resources while "maintaining an ecological balance and avoiding every form of environmental contamination." The draft is to be discussed by the full assembly, and the points approved will be included in the new constitution.

The Natural Resources Commission, which put together the constitutional recommendations, also investigated issues such as the future of the Peruvian Amazon basin, a region which covers 750,000 square kilometers, one-third of Peru. The commission recommended that a special Institute of Amazon Research be created to determine the area's potential for the pharmaceutical industry, medicine, tourism and hydroelectricity. "Its ecological conditions demand an appropriate technology...to determine the best route to take to develop this region without destroying

it." the commission concluded.

Peru also must respect the recommendations made at the 1972 Environmental Conference in Stockholm and fix permissable limits of pollution, the commission said. The industrial sector in particular must prevent, fight against and control environmental pollution.

The commission stressed the need for legislation and said the government ought to assume responsibility for dumping into rivers and lakes and control it by introducing a system of permits. At the same time, a National Institute for Natural Resources should be created to coordinate the work of existing government offices which deal with environmental health, forestry, agriculture and meteorology.

And the public should be made environment-conscious, the commission said: "Education should cover ecology, pollution and environmental legislation and be taught at all levels." Universities too should be more involved in research on resources, technology and means of employing it.

LORETTA McLAUGHLAN

Venezuelan mining firm does environmental impact study



CARACAS—Official Venezuelan policy is pro-conservation—and pro-development. All major projects are required to have environmental studies before receiving a go-ahead from the Ministry of Environment, but in no way are these studies allowed to interfere with or slow down industrial progress.

A case in point is the mammoth strip-mining project set for the western state of Zulia. More than \$140 million will be invested in its development over the next five years.

Coal beds there are said to be among the largest in Latin America, and they are being developed by CORPOZULIA, which expects to take as much as 4 million tons of coal a year from one mine by 1988. Other mines may follow. At the rate of 4 million tons annually, the Guasare mines have reserves estimated to last 40 years without new exploration, a study by Eisenbau Essen of Germany found.

CORPOZULIA contracted with Zulia University to make an environmental study of the coal-bearing region. The resulting report makes a number of recommendations: creating sedimentation basins, collecting topsoil for later replanting of stripped areas, draining water from excavations and treating it, making a land-use plan, re-planting native flora.

So far, these recommendations have been neither accepted nor carried through.

HILARY BRANCH
ELIANE DE STEINHEIL

More on Latin America...

VENEZUELA'S MINISTRY OF ENERGY and Mines is studying a solar and wind energy plan, the first of its kind in the country, for a primitive fishing village on the desert coast of Falcon State. The pilot project, designed by the Brace Research Institute of McGill University in Canada, would be applicable to other populated areas of similar physical characteristics.

At a cost of some \$200,000, the solar plan would equip the village of Codore Afuera (pop. 110) with a locally built 500-liter-a-day desalination plant. The plant would be supplied with sea water by a wind-driven reciprocal pump feeding a storage tank in the village 25 meters above sea level. Two Swiss eolic turbines of 6kw each, working with winds of 40 Km/hr., will provide electricity. Among benefits in store for fishermen's families will be showers, ice cubes, free salt from the evaporation pools for preserving fish, and possibly a solar steam kitchen.

THE PERUVIAN INSTITUTE OF GEOPHYSICS has installed the first solar observatory in the southern hemisphere in a remote part of the central Andes of Peru, some 4,600 meters above sea level.

The "Cosmos" observatory houses a coronograph which has been designed by the Japanese astronomer, Mutsumi Ishitsuka. Besides the observatory itself, the Institute has opened a geomagnetism station and a meteorological office. Plans are now being made to install a pollution station to complete the laboratory.

Total investment so far is in the region of \$30,000 of which slightly over half corresponds to the coronograph itself.

VENEZUELA'S NEW PRESIDENT, Luis Herrera Campins, is giving special attention to the traffic jams which afflict Caracas at all hours. His team has underlined as top priority the following problems:

- Ten thousand vehicles are added to Caracas streets each month;
- Heavy vehicles circulate on high speed roads;
- Speedy removal of traffic casualties by ambulance.

In a civic campaign, a local TV channel obtained the collaboration of residents and police to remove illegally parked cars and abandoned wrecks. Commentators exhorted drivers to observe regulations and leave space for traffic to flow; buses were asked to stick to the right and use bus stops. In one week these simple measures transformed a congested avenue into a reasonable artery.

In Africa ...

AFRICAN COUNTRIES should view the environment as an integral part of the development process, and incorporate environmental considerations into their development policies. This is one conclusion government officials and planners from 25 African states came to during a meeting in Addis Ababa last month (WER., Feb. 26, p. 7).

Too often, development has created acute social, economic and environmental problems for, participants agreed, many African nations imitated the lifestyles and consumption patterns of affluent countries and uncritically adopted capital- and energy-intensive tech-

nology as causes.

Economic Commission for Africa executive secretary Adebayo Adedeji told the meeting: "Although we pretend...to be preparing ourselves and our countries for self-reliant development processes and authentically African life-styles, all we have really succeeded in doing is to mimic other societies and their life styles.

AN AGRICULTURAL PROJECT in Madagascar that will develop 3,700 hectares of new land for rice and cotton and complete an irrigation system serving 10,000 hectares, should have an environmental benefit in addition to the obvious ones. Officials hope to control schistosomiasis (bilharzia) through treatment of infected areas as the irrigation scheme is completed. Of a total cost of \$26.4 million, the World Bank is providing \$12 million.

A FEW CASES of mercury poisoning are still recorded in South Africa-among African women using skin-lightening creams illegally smuggled into the country from Lesotho. Some contain up to 11 percent mercury, according to tests made by the National Institute of Occupational Diseases, in Johannesburg. South Africa banned mercury-based creams in 1975.

TO EASE CONGESTION in Johannesburg, the municipality is considering going back to trams-a vehicle it abandoned in 1961.

At the moment most office workers in South Africa's biggest city prefer to use cars, and the pedestrian/automobile conflict in the city center is now deterring shoppers and seriously threatening the viability of the core's 3,000 retail

SOUTH AFRICA has begun work on its third oilfrom-coal plant. By the mid 1980s the first two plants should meet a third of the nation's gasoline requirements. South Africa imports about 100 million barrels of crude annually, according to "Energy" the journal of Sasol, the state run company which produces oil from

Land use in Rhodesia becomes a black vs. white power issue

SALISBURY—In Rhodesia, people and land have become a major side issue of the transfer of power from 240,000 whites to nearly seven million blacks.

The present white-dominated government is allowing blacks to buy land, houses and businesses anywhere in the country and at the same time is stopping white exploitation of tribal trust lands by protecting them for usage by blacks only.

But the government also wants to preserve 10 percent of the country for national parks, forests and wildlife preserves.

And this brings into focus the issue: Which is most important, the growing population that needs parks and state land on which to grow food, or the wild creatures and plants that need protection from man's encroachment?

The argument has been highlighted in the Salisbury parliament with a heated debate on land tenure.

Black independent MP Thomas Zawaira said, "We know we are treading on the emotions of whites here. If we try to tread on this (park) land we will look like uncivilized people, who have no consideration for wildlife, beautiful forests, flora and fauna."

"We value these things as much as the white man does. But we value mankind higher. We see the plight of man before God as

higher than the plight of animals and plants."

A white MP said that the exploding black population (the rate of growth is currently 3.5 percent) would never be satisfied and that all state land would eventually disappear without government control.

It was decided that not more than one percent of parkland and wildlife reserves could be turned over to agriculture each year.

JOHN KELLEY

Freak weather lessens African locust threat

NAIROBI—A rare and unpredictable change in the weather pattern over eastern Africa has saved Kenya, Tanzania and Uganda from a threatened locust invasion in the early months of 1979 but locust experts warn that the locusts still exist, posing threats to a wide area of Africa and Asia.

January and February are normally hot and dry in East Africa, with a predominantly north-east monsoon wind. This year Kenya had freak wet weather and weak southerly winds, which did not carry the locust swarms south from their breeding grounds in Ethiopia and Somalia.

Norman Palmer, a Fellow of the Royal Meteorological Society of London and an expert on East African weather conditions, explained in Nairobi that the unusually cold weather in Europe during this period had affected the weather pattern in East Africa. The unseasonable rain in parts of Kenya in January and February was the heaviest ever recorded.

Locust experts say the unexpected weather enabled the locust

control teams in Ethiopia and Somalia to destroy far more of the breeding swarms than they could otherwise have hoped for.

The Kenya Government continues to maintain its anti-locust operations along the country's northern border in case substantial numbers of locusts escape destruction and later fly south. For the present, at least, the threat of a locust crisis in East Africa has receded.

CHARLES HARRISON

The Arab League embarks on four environmental programs

CAIRO—Is it possible to satisfy basic human needs without violating the environment?

That's the question being examined from four different angles in three Arab countries under the direction of the Arab League's Educational, Scientific, and Cultural Organization (ALESCO).

ALESCO, explains O. A. El-Kholy, the assistant director-general for science and technology, has identified food, shelter, health, and education as human needs. Two research centers in Egypt and one each in Jordan and Sudan are investigating ways in which these requirements can be met in the Arab world and leave the environment unharmed.

This project, now a year old, is one of four that ALESCO has undertaken in the field of environmental education. According to Dr. El-Kholy, the others are:

- A detailed plan of action for Arab universities and institutes that wish to study renewable sources of energy: biomass, wind, and solar. "In many cases," says Dr. El-Kholy, "people who want to look into wind and solar energy don't know what to ask for or where to begin. We want to put between two covers what should be done."
- Preparation of material on environmental issues that will be disseminated by the Arab Broadcasting Union. The information is designed to encourage radio and television stations to produce programs alerting the Arab public to the relationship between society and the environment.
- Publication of source books and teaching units for secondary and university teachers specifically geared to environmental problems.

 NATHANIEL HARRISON

Solar water heaters may kill a debilitating parasite

CAIRO—Egypt has about 4000 hours of sunshine a year, and scientists here think it could be used to combat bilharzia, the country's most debilitating disease.

The Ministry of Electricity and Energy plans to import 30-40 solar water heaters to be tested in offices, homes and other structures throughout the country over the next few months. Egypt eventually wants to manufacture and market its own solar water

Environmental Management...

A TUNISIAN SEWERAGE PROJECT—extending the sewerage facilities to match the national program of an increased water supply—will have an environmentally beneficial by-product: pollution control of the Lake of Tunis. And as a result the people's health in Tunis and Sfax is expected to improve. The urban sewerage project will be for greater Tunis and Sfax and will cost \$77.5 million in all, of which about a third will come from the World Bank.

IN KUWAIT, the first regional symposium on thermal insulation was held earlier this year. Its objective was to increase public awareness of the value of insulation as an energy saver and to compare the efficiency and suitability of different insulants to Arabian Gulf conditions. The meeting was held at the Kuwait Institute for Scientific Research and was attended by 80 Kuwaiti delegates and about half that number from other Arab states, England, Germany, France and Holland.

IN EGYPT, control stations have been established along the Suez Canal to treat oil leaks and combat pollution caused by increased ship traffic. According to the Suez Canal Authority, machinery has been installed to pump chemicals to dissolve oil that accumulates on the surface of the water.

INDIAN OCEAN states and a number of international organizations are cooperating in a year-long investigation of climate, marine currents, and marine management in the area.

Called the Cooperative Investigation in the North and Central Western Indian Ocean (CINCWIO), it includes a detailed study of monsoon conditions off the Kenyan and Somali coasts and coordinated marine research programs.

This area of the Indian Ocean was selected, a Unesco spokesman said in Nairobi, because of its complex pattern of currents, its unique climatological aspects (including the yearly north-east and south-west monsoons), and its importance as a shipping route.

A United Nations Environment Program expert, Wazir Okera, cautioned the participants to give full weight to environmental questions during the investigation.

THE FOUR THEMES of World Environment Day (June 5, 1979) are noise pollution, tourism and the environment, resistance to pesticides, and schistosomiasis or bilharzia (snail fever).

In Asia ...

THE SOUTH KOREAN GOVERNMENT may build solar-heated houses in the Changan-pyong area on the eastern outskirts of Seoul.

A plan jointly worked out by the Ministry of Energy and Resources and the Seoul City government envisages the building of solar energy-supplied homes with floor spaces of 78.5 to 157 square yards (66 to 132 square meters). Builders of solar heated homes will be given technical and financial assistance from the public sector, and tax incentives will be given to offset the high construction costs.

THE PHILIPPINES GOVERNMENT will establish small-scale projects in two villages, with assistance from the United Nations Environment Program (UNEP) to show how wind, solar power, hydro-power and biogas can be used in small communities.

Higantan, an island settlement north of Leyte, with a population of about 1,600, will get four new wells, powered by windmills, to provide its first reliable water supply system. A biogas plant, powered by poultry and livestock wastes, will supply gas for cooking, and a solar water heater, manufactured in the Philippines, will heat water for a school clinic.

The other project, on Bohol island, north of Mindanao, involves a small hydro-power plant, powered with water diverted from a river, producing 15 kilowatts of power.

Local people will be trained in both communities to take over these projects.

UNEP's Energy Task Force chairman, Essam El-Hinnawi, said at UNEP headquarters in Nairobi that the Philippines project could serve as a model to other countries. "What we are doing is to provide adequate energy for the poor," he said.

BLACKOUTS IN BANGKOK and other provinces may be instituted if power consumption is not reduced satisfactorily following the implementation of oil-saving measures, said the general manager of Thailand's Electricity Generating Authority.

The government has already acted to reduce electricity consumption. All government offices and state enterprises can be instructed to switch off their airconditioners, and television stations told to shorten their programs. Neon lights have been ordered turned off earlier and alternate street lights switched off. Power voltage has also been reduced. Also, the government will soon launch a campaign to encourage the public to conserve oil and reduce power consumption.

A spokesman said that the oil-saving measures adopted will save 500,000 to 600,000 liters of fuel a day, which is still below EGAT's goal.

heaters. The heater currently under consideration holds 150 liters of water, costs \$350, and can reach temperatures that are hot enough to kill the disease-bearing larvae. With hot water at home, village families need no longer go to the infested canals to bathe and wash their clothes.

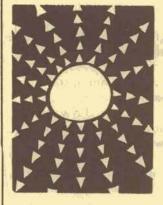
"It's a side benefit, of course," says one scientist, "but it may turn out to be more important than just the hot water."

Ministry officials say that with government subsidies the heaters could be sold on the market at reasonable prices, thereby saving on butane gas and electricity, the country's traditional means of heating water.

In cooperation with West Germany, the National Research Center is also testing a solar-powered refrigerator for fruit and vegetable storage. Dr. Ibrahim A. Sakr, Director of the Center's Solar Energy Laboratory says solar refrigerators would be used along the Red Sea and in Upper Egypt communities that are now without electricity. And the Center is experimenting with solar-powered desalinators for desert settlements.

The Ministry of Electricity and Energy wants to commit approximately \$75 million to solar energy development over the next five years, but with all of Egypt's needs, foreign exchange may be difficult to get for this project.

NATHANIEL HARRISON



India signs solar agreements with eight countries

NEW DELHI—India has entered into agreements with eight countries to cooperate on research and development of solar energy technology.

The countries are: Australia, Cuba, Federal Republic of Germany, France, Mexico, Turkey, the United States and the Soviet Union.

The Indian government increased its financial allocation for research and development from Rs 282,000 (\$35,000) in 1974 to Rs 1,100,000 (\$137,500) in 1979.

India's prime Minister, Morarji Desai, told the Parliament, "We have to find out a method of storing this energy. With human ingenuity, I hope we would be able to store it."

Desai said 21 institutions within India were engaged in research and development work on solar energy.

To fulfill Desai's dream of finding a way to store energy, scientists from various parts of India met recently in Chandigarh, 200 miles north of Delhi, at a three-day workshop. They concluded that India had yet to develop an economically viable technology for storing solar energy.

R. MURALI MANOHAR

French debate solar energy: Sell it or keep it?

PARIS-A debate is shaping up in France over whether the country's "national policy on solar energy" should turn its attention more toward national requirements and less toward the Third World export market, which French industry perceives as

Announcing the 1979 "national solar budget" last fall, the president of the Commissariat a l'energie solaire (COMES), Henry Durand, said 60 percent of the total budget of \$65 million would be earmarked for research and development on photovoltaic cells destined for export. Only about \$16 million, he said, would be for assisting homeowners to convert to solar water and space heating. Last month, the French government extended for another six months its policy of offering a grant of 1000 francs (about \$235) to homeowners converting to solar water systems.

Recently, the French press, bowing to pressure from environmental groups, launched a campaign denouncing government policy which it says favors French industry to the detriment of the French people.

Malta explores windmill power to cut costs



VALETTA—The whiplash effect of oil-price rises has affected tiny Malta. Following the 1973 rise, the government began operating only 50 percent of this Mediterranean island's street lights. Now more stringent conservation measures have been taken: All gasoline stations are closed on Sunday, Summer (daylight saving) Time began three weeks early and, potentially the most saving of all, a windmill-powered electricity-generating station is being built with West German help as an experiment.

Two years ago a group of West German experts visited Malta to decide which alternative sources of energy-solar or wind power—would be best. They chose windpower. Back in Germany, they worked out the method in their labs and came up with this system: Large wind-powered pumps bring sea water up into a reservoir; when the water flows back to sea level, it turns turbines which generate electricity. Turning the turbines by wind power directly is unfeasible since Malta has about 25 wind-free days a vear.

Solar energy experiments here have not been overwhelmingly successful, although there are a number of projects in operation.

FREDERICK BARRY

Energy Sources...

AT A FRENCH-PORTUGUESE solar energy congress in Lisbon, Sidonio Pais, Portugal's general director of energy, said the government was working on a subsidy program to

boost the use of solar energy.

The meeting, the first in Portugal on solar energy, was sponsored by the energy board and the French embassy in Lisbon. The French will finance smaller solar energy projects in Portugal. Until Portuguese authorities define a wider solar energy policy, financing of larger projects is unlikely.

FRANCE HAS AGREED to provide training facilities, experts and equipment for a proposed National Institute of Solar Energy in Pakistan.

A spokesman for the Ministry of Science and Technology discussed utilization of solar energy for pumping water and desalination, for drying fruits and vegetables and for heating and cooling buildings.

The need for further research and development on using solar energy for electrification

was also stressed, he said.

A STRONG PLEA has been made to the South African government to greatly increase the amount of money available to solar energy research and development, especially in view of the long sunshine hours. In winter the great central plateau-80 percent of South Africa-is characteristically cloudless.

At the moment the United States spends 200 times more than South Africa on solar research

and development.

But solar energy is catching on. According to W.N. Cawood of the National Building Research Institute in Pretoria, if current trends continue, solar energy should contribute 6 percent of South Africa's total energy needs by the year 2000. But if solar energy were to get the funds it needs, the figure could be 15 percent.

A NEW ZEALAND SOLAR product company has manufactured a cylindrical solar water heater called the Suntrap. Test results showed that the cylindrical heater saved 271 kilowatt-hours of electricity compared with 140 kilowatt-hours for a conventional flat-plate heater. The heater holds 45 liters and can supply at least 91 liters of hot water a day. It traps the sun's rays at any angle even when the sun is on the horizon. A reflector directs the sunlight into the tank of the heater. The company is Solar Products Ltd. of Masterton, North Island.

Down under . . .

AUSTRALIA'S FIRST national solar energy conference at Melbourne University was told the country would have to invest \$40 billion over the next 20 years if solar energy were to become a viable alternative to crude oil. The country's reserves of crude will be depleted by the year 2000.

R.J. Hamer, Premier of Victoria State, said the \$40 billion investment would build a solar energy industry that would equal the country's motor industry—yet even at that price it would supply only 10 percent of Australia's energy needs. Industry now uses 40 percent of today's solar energy output, but widescale commercial application is now too costly; industry lacked confidence in its efficacy, economics, and safety, he said.

Federal government grants for 1978-79 in renewable energy sources research totals \$7.5 million to date.

AUSTRALIA'S SUNSHINE STATE, Queensland, has imported thousands of New Zealand wasps in an effort to reduce its \$1.1 million insecticide bill and cut down on the \$590,000 lost yearly to wheat-chewing armyworms. The Apanteles Ruficrus will do battle with the armyworms by stinging them in their caterpillar stage and laying up to 40 eggs in their bodies. The parasites eventually emerge through the skin of the host, which finally dies.

AN AUSTRALIAN COMPANY which manufactures asbestos products has signed an agreement with its workers to pay any of them \$13,958 if totally unfit to work as a result of an asbestos-related disease. If death results, the money would be paid to a beneficiary.

James Hardie and Company Proprietary Ltd. made the deal with its employees, members of the Miscellaneous Workers' Union. The company has about 6,500 workers in five Australian states, and its workers in Victoria, New South Wales, and South Australia have already approved the offer which would be in addition to workers' compensation.

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New Zealand gas consumption is heavily restricted

WELLINGTON—It began with the banning of gasoline sales from noon Saturday to midnight Sunday. Prime Minister Robert Muldoon had his own family car converted from gasoline to liquid petroleum gas. New Zealand motorists responded to the plea to conserve gasoline to cutting consumption by a whopping 16.2 percent in the first week of March.

The Iranian shortfalls of oil have taken their toll on this island country of only 3.5 million people. Minister for Energy Bill Birch has clamped heavy restrictions on oil and gasoline consumption. Service stations are now further restricted, closed from 7 p.m. Friday to 6 a.m. Monday. Oil for home heating has been rationed to 400 liters a house for the rest of the year. Birch warned that consumption in the transport industry must be cut voluntarily by 7 percent or rationing will be imposed. Commercial oil users have been rationed to 80 percent of their regular requirements. All cars are to drive no faster than 80 kilometers per hour (50 miles per hour).

Carless days are expected to be introduced next month, but a suggested car ban all day Sunday has been reduced to from 1 p.m. to midnight.

JANE NACZYNSKI-PHILLIPS

Australia may abandon strict car emission controls

PERTH—Strict new car emission controls will probably be abandoned by Australia to save both millions of dollars and millions of liters of gasoline over the next five years.

The Australian government favors abandoning U.S.-style emission controls that would have become effective in 1981 and increased the national fuel bill by 5 percent.

Anti-control groups claim the first two stages of the anti-pollution program, begun in 1976, increased fuel consumption by 7 percent in highway driving and 11 percent in city; they added \$100 to the cost of a new car and cost the motor industry \$65 million.

The Australian Automobile Association, representing some three million drivers, claims this third and most stringent stage of emission control would cost \$250 million and 900 million liters of gasoline over five years.

South Australia and New South Wales are against the abandonment. Sydney has a particularly dangerous pollution problem and studies have shown Sydney's pollution readings exceeded world health limits 240 days last year—the same level as Tokyo and approaching that of Los Angeles.

The federal government's shift to abandon the new emission standards coincides with its campaign to urge Australians to convert to LPG-driven cars. Meanwhile, after re-evaluating its reserves, the government claims the country's oil self-sufficiency has doubled—to 50 percent.

JANE NACZYNSKI-PHILLIPS

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Antarctic reactor waste buried in California

WASHINGTON—The last radioactive rock from the Antarctic's only nuclear reactor was offloaded and buried, probably temporarily, in California during the week of March 12th.

As the final 800 tons of crushed contaminated rock went into storage—all in all 14,200 tons of effluent-affected earthwas dug up from the McMurdo Station site in Antarctica and shipped to the U.S.—the saga of "Nukey Poo" is ended, or almost.

In August 1960, the U.S. Congress authorized installation of a nuclear reactor run by the U.S. Navy at McMurdo Sound, a part of Antarctica over which New Zealand claims sovereignty. It was to provide power not only for U.S. military research but for the scientists of Operation Deepfreeze.

Martin Marietta Corporation was given the contract to build the nuclear plant for \$1.4 million but, according to an article written for the Bulletin of the Atomic Scientists, the total cost was nearer \$3 million. It was installed in the Antarctic summer of 1961-62 and nicknamed "Nukey Poo."

It was supposed to be the first of many nuclear power plants in that remote area, but over 10 years it became apparent that Nukey Poo was too expensive to run—in many ways.

According to Owen Wilkes and Robert Mann, who wrote about its problems for the Bulletin of Atomic Scientists, within a year of startup a hydrogen fire occurred within the containment tanks; no environmental contamination was publicly known to have occurred. The reactor was producing power only 80 percent of the time and, in 1971, the Navy began investigating geothermal power as an alternative—there is an active crater 40 kilometers from McMurdo.

Then, abruptly, Nukey Poo shut down in September 1972. In February of the following year "a fault" was blamed. Later in 1973 it was announced that the whole reactor would be dismantled, shipped back to the U.S. and buried in Georgia. "Some" radioactive soil would also have to be shipped back because the Antarctic Treaty bans leaving radioactive waste there.

The Secretary of the U.S. National Academy of Sciences committee on polar research said Nukey Poo was shut down because of "numerous malfunctions and its pollution potential." But the removal plans prepared by the Naval Nuclear Power Unit disclosed that leaks had taken place: in 11 years of operation, cracks had appeared in the containment vessels three times. And over the entire 11 years, slight radioactive effluent had run down a drain and into the soil. The U.S. Nuclear Regulatory Commission decided that all soil that had soaked up any radioactivity had to go. And, starting in 1977, it was shipped on the USNS Bland to Port Hueneme in California.

Eco-politics...

AN INTERNATIONAL GROUP of lawyers and academics, chaired by Nobel Peace Prize winner Sean MacBride, has condemned the Belgian government for concluding a deal with South Africa for the importation of nearly 2,000 tons of uranium to fuel Belgium's nuclear power stations between now and 1991. MacBride, urging the Belgians to cancel the contract on humanitarian and anti-nuclear grounds, added that the Belgian government has reportedly loaned South Africa 1.3 billion Belgian francs (about \$43.3 million) for the development of uranium production.

A NATION-WIDE SURVEY has found that 35 percent of all Belgians consider the construction of additional nuclear power plants "absolutely essential." Some 12.7 percent of the population consider their construction "necessary," while 27 percent say they are "resolutely against" building more nuclear power stations in a nation that already generates a higher percentage (more than 25 percent) of its electricity by nuclear power than any other country in the world. Another 27 percent surveyed by the Belgian association of electricity companies, la Federation des Enterprises Electriques de Belgique, were without opinion.

THE FRENCH GOVERNMENT plans to tighten its laws governing theft of nuclear materials, increasing maximum penalties to several years imprisonment and millions of French francs in fines. The current maximum penalty, which applies only in cases of theft of mildly radioactive materials, is two months imprisonment and 10,800 French francs (about \$2,500) in fines. The old law, introduced in the late 1950s, was intended mainly to protect public health.

Under the new law, a draft of which the French government recently submitted to Parliament for debate, offenders would be punished for the theft of any sort of nuclear material. The government has proposed that the penalties upon conviction be "very heavy." It has recommended "several years imprisonment and several millions of francs in fines."

A MAJOR AGREEMENT on joint research and development of large-scale thermal storage systems has been signed by the nine-nation European Community (EC) and five other countries, including the United States. The agreement, called the Energy Storage Agreement, was drawn up by the Paris-based International Energy Agency (IEA).

While details of the agreement were not available, sources said the participants, besides the U.S. and the EC, would be Sweden, Denmark, West Germany and Switzerland.

California officials protested but, after the state-commissioned study (by Scientific Services, Inc., the State Health Department, Stanford University and LFE Environmental Laboratories) found "the material as currently stored poses no hazard to man or the environment," the Navy was allowed to store it in an area sealed with liquid asphalt.

While the study recommended against continuous human contact with the crushed radioactive rock, it stated, "It may be used as road fill material, and may be safely handled by humans and machinery." The Navy is now preparing an application for approval by the Nuclear Regulatory Commission to use the material in an asphalt paved surface at Port Hueneme. If approved, construction will begin in July.

The Navy maintains the material is harmless, containing only "minute quantities of radionuclides...so insignificant that the radiation exposure levels are within typical naturally occurring levels throughout the U.S."

JUDITH H. DOBRZYNSKI



English researchers dispute government energy forecasts

LONDON—If Britain sticks to its current energy forecasts, around £30 billion (\$60 million) could be wasted over the next 30 years on power station construction and investment in the nuclear industry, says a recent report by the International Institute for Environment and Development (IIED).

The Department of Energy forecasts a 35 to 70 percent growth in energy use by the end of the century. The IIED report suggests 3 percent is more realistic.

"A Low Energy Strategy for the UK" (IIED, 10 Percy Street, London WI, £8) is the result of a two and a half year study led by IIED scientists and economist Gerald Leach. It was funded by a \$120,000 grant from the Ford Foundation, plus a small contribution from British Petroleum. After analyzing current energy consumption figures and conservation measures and trends, the IIED team report presumes it makes good economic sense to continue with these same energy conservation measures. For example, it says, by the year 2010, all homes should be insulated, domestic appliances will use half the power they now need, and in just 10 years cars should get double the miles per gallon.

The report argues it's unlikely there will be any dramatic change in lifestyle; it expects that the market will respond to higher energy prices by using less energy production. It suggests that rather than major expansion of the nuclear systems only about three or four nuclear stations would be needed. ALAN MASSAM

Irish court rules Viking site will be Dublin office building



DUBLIN—The lengthy battle to protect a Viking site here has been lost.

After a long legal wrangle, the country's Supreme Court gave Dublin Corporation permission to begin building civic offices at the Wood Quay site, the most important historical location in the nation's capital.

Wood Quay dates back to the very foundations of Dublin as a city. Archaeologists and other preservationists had staved off previous attempts by the corporation to begin construction work on the site (WER, Oct. 23, 1978, p. 4) while the local government claimed this was causing the cost of the building to increase.

Conservationists formed the Friends of Medieval Dublin and fought a number of court battles against the corporation, but in a decision handed down by the Supreme Court, previous legal victories for the preservationists were overturned.

Immediately after the decision, Dublin Corporation moved construction machinery onto the site and began work. As a compromise, it will build a museum for Viking artifacts.

TOM MacSWEENEY

Huge new Czechoslovak farms create environmental problems

PRAGUE—Czechoslovakia is transforming its landscape. Where once there were small family farms of half a hectare, there now are large cooperatives. And over the next 10 years, Czech authorities plan to restructure and integrate the nation's agricultural land to create huge cooperatives and state farms. Each will incorporate several villages.

Government experts say this switch to massive farms may mean that traditional environmental protection methods are no longer valid. To create fields big enough for large-scale farm equipment, forests will have to be cut. Roads will have to be realigned.

New anti-erosion methods will represent a major investment. Czechoslovak experts claim traditional anti-erosion measures are almost worthless for large-scale farms, but say they are working on new methods.

Government planners warn they expect to be at odds with environmentalists frequently over the necessity of cutting woodlands for large fields. But they say that while their objective is to create a highly productive countryside, this does not mean that environmental quality cannot be high as well. IVA DRAPALOVA

In Europe ...

CHRONIC TRAFFIC JAMS in Dublin are costing £2 million (\$4 million) a week in wasted fuel and lost business.

Ireland's capital-city businessmen have claimed that the traffic-choked city is costing over £100 million (\$200 million) a year in lost fuel and business and have demanded a new rapid-rail transport system. They say that it could pay for itself in two years at the present rate of loss.

The national transport company, CIE, has estimated that a rapid rail system would cost £5 million (\$10 million) per mile in Dublin, compared with between £20-30 million (\$40-60 million) in other European cities.

IN BRITAIN'S MAJOR CITIES blood lead levels are to be tested in a survey coordinated by the government Departments of the Environment and of Health and Social Security.

Some London boroughs and the cities of Birmingham, Leeds, Liverpool, Manchester, Sheffield and Glasgow will be included to give a representative national sample. Each local survey will cover an average of 200 adult volunteers. Children will be included in areas where high risk might be expected, such as near smelting works or busy road junctions.

The first phase begins this month with a follow-up phase beginning in 1981.

Environmentalists have been calling for a reduction of lead in water, food and gasoline. Last year a pollution working party of the Conservation Society, claimed that the evidence implicating lead as a public health hazard was now so strong that the producers of lead that finds its way into the environment should be required to prove that it is doing no harm.

MORE THAN 70 WESTERN FIRMS took part in a two-week exhibition in Moscow last month, "Environmental Pollution Control '79," sponsored by the Soviet Chamber of Commerce and Industry.

Visitors to the exhibition at Moscow's Sokolniki Park had a chance to view mobile pollution-monitoring laboratory vans and a variety of automatic gas analyzers, dust-measuring nephelometers, laser systems, atomabsorption spectrophotometers and other sophisticated electronic apparatus for assessing pollution levels.

Among the 14 U.S. firms represented at the exhibition were Hewlett-Packard, Palo Alto, Calif.; Millipore Intertech, Bedford, Mass.; InterOcean Systems, Inc., San Diego, Calif.; and Aminco of Silver Spring, Md.

Recycling ...

A HIGHLY AUTOMATED solid waste reprocessing plant now being put into operation in Minsk, the capital of Soviet Byelorussia, will be able to handle up to 400,000 metric tons of refuse a year.

The Soviet Communist Party newspaper Pravda said similar plants were also functioning in Moscow and Leningrad, while others were being planned for the Byelorussian city of Mogilyov and in Tashkent, capital of Uzbekistan in Soviet Central Asia.

The Minsk plant produces 100-kilogram compressed chunks of waste metal separated out of the refuse electromagnetically, as well as up to 60,000 tons of organic compost a year for fuel and fertilizer purposes.

A RECLAMATION PLANT for domestic and commercial refuse, said to be the first municipally owned one of its kind in Europe, is to be opened in June in Newcastle, England, by the Tyne and Wear County Council.

Built at a cost of £3.5 million (\$7 million), the Byker Reclamation Plant will process waste at the rate of 20 tons an hour over two shifts, or 300 tons a day. Initially it will recover unburnt ferrous metal, and pellets of waste derived fuel (WDF) equivalent to at least 30 percent of the weight of the original input.

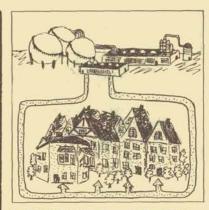
The WDF, which was test-marketed in 1976, will be conveyor-fed to an adjoining district heating boiler plant due to be completed later this year. Surplus will be sold commercially.

THE EAST GERMAN government has started a lottery as a special bonus for those who excel in collecting materials for reclamation and reuse. In addition, the collector is paid according to a government-set price list.

Organized search and collection of recyclable material dates back in Germany to Hitler's Deutsches Reich, when the economic machinery of World War II required total mobilization of the Reich's resources. The current regime is keeping up this collecting campaign.

Households in East Germany yielded during the first three quarters of 1978 some 180,000 (metric) tons of metal scrap and waste and over 120,000 tons of waste paper.

In East Germany, 75 percent of steel made is re-smelt material; the paper industry uses 43 percent recycled paper; textile plants blend 10 percent reuse fibers in new material, and between 60 and 70 percent of bottles and glasses newly delivered by factories are actually starting their second life.



Pioneer Danish town heated by chemical waste water

FREDERICIA, Denmark—This town of 33,000 inhabitants plans to be the first in Denmark—and possibly the world—to be almost entirely heated by a chemical factory's waste water.

A long-term agreement has been signed by the town and the Superfos chemical plant. Over the next three years Superfos will increase its delivery of waste water so that it provides nearly 100 percent of the town's heating needs.

The eventual savings of fuel oil is calculated at 30,000 tons annually, or \$3.5 million in foreign exchange. In 1977 waste water heat equalled 6,000 tons of oil; in 1978, 7,000 tons. It is estimated this will rise to 10,000 tons in 1979; 15,000 in 1980; 20,000 in 1981 and 30,000 tons by 1982.

The first Fredericia contract was signed in 1976, and this breakthrough was followed by similar agreements in other Danish towns

Superfos provides the hot water free. It is the result of manufacturing nitric acid, a by-product of fertilizer making. The town's district heating system will have to invest the equivalent of \$6 million for an extension of the heating network, but part of this will be covered by a subsidy from the Danish Government, and the loan covering the rest will be serviced by savings in the cost of oil. Already heating charges to members of the system have been reduced, while elsewhere they are going up.

The additional waste water is being provided through expansion of the Superfos plant, said chief engineer Ole Jensen. He explained that hot water from the manufacturing process circulated through the district heating system and returned to the factory where it was cooled before being re-used for manufacturing.

CONSTANCE CORK

Water recycling systems used in large Japanese buildings

TOKYO—Many local governments in Japan now insist that installation of water supply recycling systems be an official requirement for construction permits for bigger buildings. These recycling systems purify all waste discharge water and then recirculate it for use once again.

There are at least 16 large buildings in the Tokyo area which boast such systems and more than 10 installations scheduled for construction are to have water recycling.

Large buildings not only consume vast amounts of water but often are located in districts where the public sewage systems are so overburdened that they are nearing the limits of their capacity. Japanese environment specialists have been strongly urging the administration of all major cities in recent months that mandatory introduction of building water recycling systems will greatly reduce the load on their public sewers and should thus become an indispensable part of all sewage programs in built-up areas.

However, Japanese metropolitan authorities are running into objections from real estate firms who object to putting in expensive piping and mains that they otherwise would not find necessary. And, apparently maintenance is costly. Some powerful real estate companies argue that although the water produced by such a system is not used either for drinking or cooking, it might be harmful if used for washing clothes or cleaning.

Nevertheless, it is the generally accepted belief in Japanese environmental circles that, despite all the difficulties, high costs and risks involved, eventually there will be few large buildings constructed in the country without water supply recycling systems.

A.E. CULLISON

Hong Kong introduces two new pollution control ordinances

HONG KONG—The rapid industrialization of the British colony of Hong Kong has brought about serious pollution problems. To control them, the government has just introduced two new ordinances.

The Air Pollution Control Ordinance and the Liquid Effluent Control Ordinance are two of five being drafted by the Environmental Protection Unit (EPU). The others cover noise abatement, solid waste disposal, and environmental impact assessments.

The government recognized the need to protect the environment as early as 1974 when it engaged consultants to draw up detailed recommendations for monitoring the environmental situation. After a two-year survey into existing pollution problems, the consultants recommended the drafting of new laws to control pollution in 1976. Various pollution control units like the Air Pollution Control Unit of the Labor Department and Marine Pollution Control Unit of the Marine Department have since been set up. In addition, the "Keep Hong Kong Clean" Campaign was organized.

Last year, the government set up a central agency, the Environmental Protection Unit (EPU), to monitor long-term trends, to formulate environmental policies, to coordinate the pollution control activities of various government agencies and to provide a technical advisory service to government and industry. EPU is now under the wing of the Environment Branch, but it will eventually become an independent body reporting directly to the Secretary of Environment.

Under the Air Pollution Control Ordinance, controls will be extended to include emissions from all types of industries. Three completely new areas—the composition of fuels, emissions other than smoke and grit, and the control of odors are covered.

SPECIAL TO WER

Environmental Legislation . . .

AT THE FIRST MEETING of the recently formed Environmental Association of China, held in Chengtu, the capital of Szechuan, deputy prime minister Ku Mu told Peter Thacher, deputy executive director of the United Nations Environment Program, that China insisted the environment be taken into account during the planning of all industrial projects—plans that affect one-quarter of the earth's population.

CHINA has declared three more protected zones for pandas, golden monkeys and other wild animals in Szechwan province. The largest zone is southern Szechwan; it consists of 40,000 hectares of subtropical virgin forest. The other two zones are along the northern border.

A recent survey by Chinese zoologists found more than one thousand varieties of wild animals in Szechwan. All these animals are protected in the five protected zones already in existence.

NEW DELHI IS SO NOISY that the capital city's police have taken ads in Indian papers shushing drivers because "noise irritates people, harms patients, creates noise pollution and shortens life, diverts attention of drivers, workers, students, etc."



In Asia ...

A RETIRED THAI PHYSICIAN who helped to establish a system of national parks in Thailand, Dr. Boonsong Lekagul, has been chosen for the \$50,000 J. Paul Getty Wildlife Conservation Prize of the World Wildlife Fund.

Boonsong is the founder and Secretary-General of the Association for the Conservation of Wildlife of Thailand. He was named the Honorary Member of the International Union for Conservation of Nature and Natural Resources based in Switzerland last year and is the fourth person in the world and the first in the Far East to receive this prize.

THE NATIONAL ENVIRONMENTAL Protection Council of the Philippines has issued its first annual report on Philippine Environmental Quality. It covers the year 1977 and runs 251 pages (from the Council at the Philippine Heart Center for Asia Bldg., East Avenue, Diliman, Quezon City).

It covers how the government handled pollution of all sorts, natural resources, land use, population, energy, natural calamities, and has a section on environmental impact statements.

The Council also publishes a Primer on Environmental Protection, a Primer on Philippine Environmental Decrees and a newsletter, Environmental Facts and Features.

A COMPREHENSIVE PLAN costing \$2.5 million and including 28 projects has been formulated for wildlife conservation in Pakistan.

The plan is designed to ensure conservation of wildlife through integrated schemes including creation of special areas, scientific surveys and management of wildlife, reintroduction of endangered species, manpower training, establishment of national parks and strict enforcement of game laws.

and strict enforcement of game laws.

The National Council for Conservation of Wildlife in Pakistan considered a number of proposals to generate funds to finance the master plan and decided to constitute a Wildlife Conservation Foundation on a voluntary basis for this purpose.

HONG KONG'S FIRST high-density solid-waste baling plant recently started a 12-month trial run. The \$3.4 million plant is part of the government's 10-year program for the efficient disposal of solid wastes.

High-density baling is a treatment process by which refuse is compacted in a hydraulic press to form bales of about 1.5 cubic meters in volume and 1.5 tons in weight. This makes the transportation of refuse more convenient. The plant will be capable of handling 600 tons of refuse daily.

Taiwan sets tough, new pollution control rules

TAIPEI—In Taiwan's rush to economic development, environmental considerations fell behind. But authorities are catching up with new, tough pollution control regulations.

At first the stress will be on combatting air pollution, coming from the smokestacks of rapidly spreading industry and the

vehicles of an increasingly affluent population.

For industry, the rules went into force March 2nd after a sixmonth grace period to allow factories to adjust. They set severe limits on noxious emissions. Organic compounds, such as toluene and formaldehyde, and other chemical pollutants such as nitrogen dioxide, fluorine, hydrochloric acid, chlorine, ammonia, hydrogen sulphide, dimethyl sulfate and tri-methylene have been added to the list of substances banned.

Rules to limit auto exhaust, estimated to account for 90 percent of air pollution in Taipei, will not be enforced until July, after they have been worked out by the National Health Administration which supervises all anti-pollution programs in Taiwan.

Violators of the new rules for industry will face heavy penalties, with fines ranging from \$40 to \$400 a day. But the administration's environment bureau director, Chuang Chin-yuan, said that strict enforcement rather than stiff penalties will be the main deterrent. He promised extra staff will be used for industry-wide inspections.

Loud protests are expected from industry once the rules start to bite, particularly since few factories took action during the grace period. Company owners point out that Taiwan's economic expansion relies on moving into industries abandoned by industrial nations partly for environmental reasons.

Chuang admits that many smaller factories could be forced out of business by the cost of installing and using pollution control equipment. To overcome this problem, he said the government is planning to establish a fund to provide long-term low-interest loans for purchasing pollution control equipment.

MICHAEL W. BOYDELL

Bangladesh tackles waste management projects

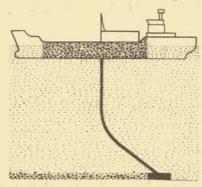
DACCA—The Environment Pollution Control Board of Bangladesh recently signed a joint communique with the United Nations Environment Program covering five projects. They are:

- Bio-gas generation using organic waste, to meet the energy needs of rural areas. A pilot biogas plant, using cow dung, will soon go into operation in Savar, 32 kilometers from Dacca. If it is successful, the government and UNEP will jointly finance a \$1.35 million national scheme.
- Sanitary landfill, to dispose of solid wastes in the capital, Dacca.
 - Extension of the sewer systems to cover all areas of Dacca.
 - Building public toilets throughout the capital.
 - And construction of 100 parks within Dacca.

To heighten environmental awareness, the Environment Pollution Control Board published a booklet of slogans and distributed it to industries, schools and offices. This promotion is also seen in newspapers and on radio and television. A leading government official said, "This program has had tremendous impact on the people."

SPECIAL TO WER

Law of the Sea: Russia and China vs. American mining



GENEVA—The six-week session of the 158-nation Law of the Sea Conference opened March 19 with clear evidence that the issue of deep-sea mining would continue to be the major point of discord.

Both China and the Soviet Union—in an unusual display of unity—warned at the opening session that any unilateral national legislation on deep-sea mining could undermine the work of the conference. And Ambassador Shirley Amerasinghe, Sri Lankan conference chairman, expressed the hope that seabed legislation planned by "certain industrialized countries" would not prejudice the cooperative atmosphere.

However, U.S. delegate Elliot Richardson replied that a U.S. draft bill on this issue was designed only as a temporary measure to permit American firms to press forward on their own until a wider conference agreement was achieved.

But the Soviet Union, avoiding specific mention of the U.S., declared that such unilateral action would jeopardize conference efforts to reach a consensus. And China said it supported statements made by a representative of 119 developing countries that unilateral legislation would damage the achievements already accomplished and would undermine negotiations.

Although the conference that began in December 1973—it is the longest-running United Nations special conference—is seeking to regulate all human uses of the oceans, including fishing, navigation, mammal protection and seabed exploitation, the latter issue has touched off the most intense conflicts.

Richardson told the delegates that the bill, which has already passed the House of Representatives, was designed only to prevent the dispersal of technical ability while the conference worked out an international convention agreeable to all. He stated it would be in the interests of the entire world that an early start be made on exploitation of the nickel, cobalt, copper and manganese on the ocean floor and added, mining companies should not be expected to suspend their activities because the work of the Law of the Sea Conference was dragging. Richardson noted that the draft law foresaw no issuance of mining permits before July 1, 1982, and that in any case deep sea mining would not be commercially possible before 1985. WILLIAM G. MAHONEY

Water wise ...

THE UNITED NATIONS ENVIRONMENT PROGRAM (UNEP) will spend six months this year collecting, analyzing and appraising information on different methods of gathering rain and storm water in rural areas.

Ms. Letitia Obeng, chairman of UNEP's soil and water task force, explained at Nairobi headquarters that although much scattered information exists on water collection, no one has yet compared and evaluated the different methods—including age-old traditional systems used in Africa and Asia.

"In China, water is gathered and stored underground," Ms. Obeng said. "There are many methods of capturing rainwater—some simple, others quite sophisticated."

In the Sudan, native plants are used to treat stored water; in other areas, different local materials are adapted for storage and transportation.

Once the relevant data has been collected, a workshop of consultants and experts will be held to prepare guidelines for the better harvesting of rain and storm water.

A number of consultants are collecting the initial information in such countries as the USA, India, Mexico, China, Australia, USSR and in Africa. Later, it is planned to hold field demonstrations to record technologies and methods of rain and storm water collection.

IF THE CURRENT LEVELS OF POLLUTION in the Mediterranean are not lowered, the sea will renew its fish and plant life in the next 50 years, and the new species will not be commercial," French oceanographer Jacques Cousteau warned on a recent visit to Madrid to promote the Spanish translation of his encyclopaedia of the seas.

Cousteau said some 1,000 analyses of Mediterranean waters taken in all parts of the sea over the past 12 months have revealed that "this sea has lost 40 percent of its vital capacity thanks to pollution." He attributed this steady death to chemical pollution from factories and nuclear plants along the Mediterranean coastline, organic waste from towns and tourist centers and to "mechanical aggression"—reclamation of sea acreage for building purposes, construction of hundreds of jetties and quays, and modern methods of fishing using, for example, dynamite.

To save the Mediterranean, Cousteau urged an immediate ban on the dumping of degradable wastes and strict controls on effluent.

In Latin America ...

PRESERVATION OF THE ENVIRONMENT was the theme chosen by the Roman Catholic Church in Brazil for its year-long 1979 Fraternal

Campaign.

Cardinal Ivo Lorscheiter, secretary of the Bishops Conference in this largest Catholic country in the world, said: "This might appear a strange attitude for the Church to take, but our role is to preserve the creation of God, who gave us a paradise which is now being destroyed by man." He said there was an imminent ecological crisis and that only an urgent change in international socio-economic behavior will save the world from utter chaos.

The campaign consists of sermons on ecology, meetings on the subject by church groups, publication of environmental information and educational ads in the press, radio and

television.

MEXICO IS DEDICATING two more geothermal generating units this month at the Cerro Gordo plant near the U.S. border outside Mexicali. Using heat from natural underground sources, the 150,000 kilowatt plant saves about \$28 million a year in fuel oil.

The potential geothermal power there is 900,000 kilowatts, said Mexican President Jose Lopez Portillo who, as head of the Federal Electrical Commission, saw the potential of the area in 1973. A side effect of the Cerro Gordo installation is the production of 70,000 tons of potassium chloride a year with a value of more than \$6 million, which is used in fertilizers.

THE LARGEST BEER COMPANY in Colombia has created an annual \$25,000 prize for the best investigation or study favoring conservation of the environment. Selection of individuals and institutions will be made by a blue-ribbon committee headed by former Colombian President Misael Pastrana and Mostafa Tolba, executive director of the United Nations Environment Program.

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African miracle tree won't perform miracles in Brazil



MANAUS—First indications are that the spectacular miracle tree project in the Brazilian Amazon might be a failure.

Botanists and ecologists gathered at a recent seminar on Jari in Manaus, the capital of the state of Amazonas, gave eyewitness reports that the project might be in serious trouble. They concluded that the planting of the fast growing African tree was undertaken without the necessary feasibility studies and that there is still a general lack of knowledge about the agricultural capacity of the Amazon basin.

The Holland-sized Jari project in the eastern Amazon was started by American billionaire Daniel Ludwig, eight years ago. Ludwig's plan was to supply the cellulose for the world's paper industry by the mid 1980's. Almost 100,000 hectares of jungle have been cleared and planted with Gmelina arborea, an African softwood tree which grows at a spectacular rate of up to four meters a year. This tree matures in 8 to 10 years as compared to the 20 to 50 years for the conventionally used eucalyptus or the northern hemisphere pine.

That sounds like sound economics and great profits for Jari and Ludwig, however, after eight years, it appears the African tree is

not adapting well in the Amazon.

Paulo Cavalcante, director of the Belem Botanical Garden was in Jari recently and reported that large areas of the Gmelina were being removed and replaced by Caribbean pine. "I believe that their upland agriculture has been a disaster," was Cavalcante's conclusion.

American ecologists who now work for the National Institute of Amazon Studies, INPA, Judy Rankin and Phillip Fernside, said at the seminar that the Gmelina was being attacked by fungus and caterpillars and that in poor soil areas it was not attaining the expected growth rate.

"Jari is still continuing indiscriminate tree felling and clearing. It is turning Amazonia into a desert and bringing unforeseeable

consequences to the regional flora."

The Jari Seminar was organized as a result of the growing interest in the development of the Amazon and especially the recent heated controversy over the purported Brazilian government plan to give out huge lumbering concessions to multinational firms. Conservationists warn that such a move—especially if done without prior research would lead to a rapid destruction of the last large tropical rain forest in the world. This in turn could turn the area into a desert useless for agriculture or or anything else (see WER, October 9, 1978, p. 3).

GEORGE HAWRYLYSHYN

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Romania explores nuclear and oil shale energy resources

BUCHAREST—Romania, still the second largest European oil producer after the Soviet Untion—14.6 million tons in 1977—may be without its "black gold" in some ten years if new oil deposits are not found, government officials said. Economic planners have ordered development of "alternate forms of energy," including atomic power and oil shale, to save depleted domestic reserves of crude oil and natural gas.

The State Committee for Nuclear Energy of Romania and the Agency of Atomic Energy of Canada have signed several contracts for the building of nuclear power stations in this country.

The documents provide technical assistance for the construction of the first unit, including nuclear equipment, and the training of Romanian staff.

The deal was accompanied by the signing of a one-billion dollar loan agreement between the two countries in connection with the sale of four 600-megawatt nuclear reactors to Romania. The loan is the largest of its kind arranged through Canada's Export Development Co. for the sales of Canadian-produced goods and services. This is the first Canadian nuclear reactor sold to a Communist country, and the agreement follows several years of negotiations between Canada and Romania.

Romania intends to build up to 16 nuclear power static ns over 20 years to replace existing oil and coal plants. Plant ers say Romania will meet 20 percent of its energy needs with nuclear plant-produced energy by 1990.

Work at the first nuclear electric station, which will use natural uranium, could start this year.

"The signing of the documents is an important step in the development and expansion of nuclear cooperation between Canada and Romania...for the peaceful use of atomic energy," the Romanian official press agency said.

Romania is also cooperating with the Soviet Union for the joint construction of a 440-megawatt nuclear power plant. The design and construction of the plant is to be done by Romanian specialized enterprises. The plant will use enriched uranium to produce about 2.6 billion KWH of electricity a year, according to press accounts.

Meanwhile, the construction of a 990-megawatt electric plant to be fueled by oil shale started last year. The plant, described as a "world premiere," will burn some 12 million tons of shale annually, to be extracted in south-western Romania at Anina, where the plant will be located.

SPECIAL TO WER

Energy Sources...

THE EUROPEAN COMMUNITY (EC) has approved aid totalling 5 million European Units of Account (about \$6.5 million) for uranium exploration projects in the nine countries of the EC. The aid, given to private firms selected after tender offers to the EC, is intended for programs undertaken between 1979 and 1981.

This is the fourth such program since 1976 when 1 million EUA in aid resulted in seven uranium prospecting projects, including the one in Kvanefjeld, Greenland, where substantial uranium deposits were discovered. The second and third exploration projects each got 5 million EUA in aid.

BRITAIN IS INVESTING more money in the production of oil from coal.

In an agreement signed last month with the National Coal Board, Mr. Alex Eadie, Parliamentary Under Secretary of State for Energy, promised a government contribution of up to £800,000 (\$1.6 million) towards the estimated £1.2 million (\$2.4 million) cost of preparatory work on two pilot plants for converting coal.

At the next phase, the government would be prepared to contribute up to £20 million (\$40 million) of the estimated £30 million (\$60 million) construction cost of the two 25 ton-aday plants.

The government promised investment support for projects converting coal into gasoline, substitute natural gas and raw materials for the chemical industry following the recommendations of one of its working party reports* on future coal technology, published in May, 1978.

*Coal Technology—Future Developments in Conversion, Utilisation and Unconventional Mining in the United Kingdom". Available free of charge from The Library, Department of Energy, Thames House South, Millbank, London SW1P 4QJ.

THE INDIAN INSTITUTE OF TECHNOLOGY has announced that it has developed the most efficient photovoltaic solar cell to date. Dr. K. L. Chopra, the physicist who developed the cadmium sulphide cell, states that it is many times cheaper to produce than silicon cells and is capable of converting sunlight to electricity with 11 percent efficiency, the highest rate yet achieved. Dr. Chopra states that the CDS cells should be available for commercial production in about five years.

Energy, fertilizer, and feed

from Romanian

biogas plant



BUCHAREST—Romanian researchers are changing pig farming wastes to fuel. A pilot station for obtaining biogas—a fuel gas that contains 80% methane and the remainder carbon oxide and dioxide—from pig feces was recently set up at Peris, near Bucharest, the Romanian Communist party organ, Scinteia, reported this month.

The complex, placed near a station for filtering waste waters from the Peris pig breeding farm, can process the waste from 5,000 pigs, and produce some 500 cubic meters of biogas a day, corresponding to a power equivalent of 3.25 million kilocalories a day. It reportedly saves 75-80 tons of fuel oil a year. To speed the process, methanogenic bacteria are introduced into the wastes. Fermentation time is shortened from 35 days to one week.

The discovery will soon be applied on a national scale and according to specialists, "tens of thousands" of tons of oil products could be saved by using biogas resulting from the major pig breeding farms in Romania.

Eng. Gh. Stoica, scientific director of the Research Institute for Food Industry and Chemistry said the sludge obtained after fermentation can be used as a "best quality" fertilizer, is rich in proteins and vitamins of the B 12 group and has biostimulating characteristics. The mud, which is stabilized and has no smell, can be mixed with fodder in various amounts and used with good results in pig raising.

SPECIAL TO WER

East-bloc Comecon group expanding nuclear plans

EAST BERLIN—Member states of Comecon, the Communist economic grouping that in a limited manner parallels the Common Market, are actively expanding their nuclear power station capacities, according to a Soviet nuclear energy official.

Prof. Nikolai Sinev, a member of the Soviet State Committee for Nuclear Energy, wrote in the latest issue of the East German Army weekly "Volksarmee" that Comecon nuclear power stations now have a total capacity of 10,340 megawatts.

But, Sinev explained, this will be increased and the planned expansion of nuclear power capacity will permit Comecon states to reduce imports of expensive fuels.

He said that the Soviet Union presently has 12 nuclear power stations that produce a total of 8,000 megawatts. However, the

present Soviet five-year plan foresees construction that will provide an additional 13,800 megawatt capacity, he wrote.

The article said that the first stage power plant in Kosludui, Bulgaria, produced 800 megawatts and this plant is now being expanded.

In Czechoslovakia where four blocks of a complex are under construction, he said, this center will eventually produce 1,760 megawatts.

East Germany, with its "Nord" plant, has three reactors that since 1978 have been producing 1,320 megawatts, according to Siney.

The Pecs reactor in Hungary is scheduled to reach 1,760-megawatt output in 1984, Sinev wrote.

The article stated that nuclear power stations were also under construction in Poland, Romania and Cuba. SPECIAL TO WER

Swiss approve nuclear plans in close referendum

GENEVA—In a national referendum voters narrowly defeated a proposal that could have effectively banned new nuclear power stations in Switzerland. It was a slim victory for the government and industry. After months of public debate nearly two million people voted, and the margin against the proposal was only about 45,000.

The government had lobbied actively in favor of its nuclear energy program after the Austrian example. There, in a similar referendum last November, voters decided very narrowly against putting Austria's first nuclear power station at Zwentendorf into operation.

The Swiss proposal was aimed at curbing the government's power to decide whether to build nuclear power stations and, if so, where they should be located.

The proposal arose from a private citizen's initiative for a Constitutional amendment sponsored by Swiss environmentalists and backed by 123,000 signatures. Voters were asked to choose between three possible courses: first, decision making powers in nuclear energy policy should remain as they are; second, the powers should be shifted from the government (Federal Council—the executive arm) to the Federal Parliament; or third, veto powers over the operation of a power station should be given to local voters near the station site. The Swiss chose the first course.

The government said it needs the nuclear energy program in order to meet energy needs until the end of the century. Some 20 percent of Switzerland's electricity is nuclear generated and, to lessen its dependence on oil, the government says it must build even more: three are in operation, two under construction and five nuclear plants are planned.

It would be premature to see in the Swiss vote any waning of nuclear opposition in Western Europe—where the debate has tumbled governments and damaged political careers (see WER, Jan. 1). But energy needs create political expediency. The French cabinet earlier this month decided to speed construction of

In Europe ...

SWITZERLAND'S EFFORTS to curb noise pollution from road traffic have gone far beyond recommendations and standards established by such international institutions as the Economic Commission for Europe or the European Community.

This country's largest automobile club—the Touring Club Suisse—found that Switzerland was also more demanding than other leading countries, such as the United States and Japan. Furthermore, it said, still lower ceilings on permissable noise will be imposed in the future.

TWO FRENCH CONGLOMERATES have been awarded contracts by the government to study the feasibility of constructing a 100,000-kilowatt power plant supplied with energy generated by thermal gradients in ocean waters. One conglomerate, Compagnie Generale d'Electricite (CGE), will study the possibility of building the power station at sea. The other, Creusot-Loire, will submit a study theorizing its construction on land. Both studies will be ready, according to the French government agency awarding the contracts, le Centre National pour l'Exploitation des Oceans (CNEXO), in early 1980, and construction could begin shortly thereafter, with completion scheduled for 1983-84. The studies are the first of their kind supported by the French government.

swedish environment Party. It will not campaign on a national basis, however. Its candidates will run for office only in the Stockholm County Council elections next September. The program drawn up so far includes opposition to nuclear power plants, a ban on the sale and use of goods which could lead to pollution or damage the environment, and an inner city free of traffic.

A WORLD HEALTH ORGANIZATION group, in collaboration with the Dutch government, will meet at Bilthoven, The Netherlands, April 3-6 to examine the chronic and sublethal effects of air pollution in private dwellings and enclosed public areas. This includes schools, theaters, restaurants, stores, halls and waiting rooms. The study will not include hospitals and other health care buildings which are already covered by standards.

Forestry ...

THE PHILIPPINE MINISTRY of Natural Resources recently announced that 242,636 hectares of barren areas in the country have been reforested since 1966.

From 1966 to 1971, the average annual rate of reforestation was 7,252 hectares. Starting in 1972, when martial law was proclaimed, to 1978, the government reforested 199,122 hectares, an average of 28,446 hectares annually. In 1978 alone, 78,425 hectares were reforested by the government and the private sector. This is the highest record so far achieved in reforestation for one year.

BECAUSE MORE THAN FOUR MILLION hectares of forest land have been lost in India over the last 25 years, the government is planning to revise its forest policy by introducing environmental aspects before allowing river valley clearing projects.

The National Commission of Agriculture has suggested that if deforestation is essential for some purpose, the state legislatures should give their approval.

A recent survey has shown that of the total area lost, 50 percent went for agricultural purposes. River valley projects and rehabilitation of displaced persons took a major chunk of forest land. Industries took away over 120,000 hectares and another 57,000 hectares for road construction.

The total forested area is now estimated at 75 million hectares, about 23 percent of the geographical areas.

CHINA HAS ANNOUNCED that it will take urgent measures to revitalize its forestry industry. At present, forested land accounts for only 12.7 percent of the country's total land surface giving an average of 0.32 acre (0.13 hectare) of trees per capita. Only 69.16 million acres (29 million hectares) of saplings have been planted since 1949 and 197.6 million acres (80 million hectares) of wasteland and barren hills suitable for growing trees have not yet been afforested. Some 1.98 million acres (800,000 hectares) of cutover forest in the major forest regions have also not been reforested.

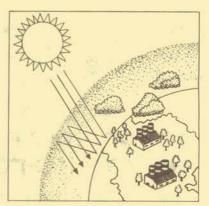
THE WORLDWATCH INSTITUTE recently published another in its series of environmental papers which may be of interest to WER readers. It is titled "Planting for the Future: Forestry for Human Needs," by Erik Eckholm, and has a most worthwhile section on some successful community forestry programs in China, India and, in particular, South Korea. Copies at \$2 each are available from the institute at 1776 Massachusetts Ave., N.W., Washington, D.C. 20036, U.S.A.

nuclear power plants because of dwindling world oil and natural gas supplies. Comecon nations are also actively expanding nuclear power capacities.

The Swiss government has no illusions that the issue is now settled. It faces another referendum test of its nuclear energy policy in May, when a revision of Switzerland's atomic energy legislation must be put to the voters for their approval.

WILLIAM G. MAHONEY

World Climate Conference sees dangerous warming trend



GENEVA—Some 300 scientists from 50 countries warned here at the conclusion of the first-ever World Climate Conference (24 Feb.) that mankind's indiscriminate use of fossil fuel, felling of timber and use of artificial fertilizers threatened serious damage to the global environment.

The statement concluding the two-week meeting added that only joint action by all states could halt and reverse the trend. The conference was organized by a United Nations agency, the World Meteorological Organization (WMO).

The experts agreed that the worst problem was the increase of carbon dioxide in the atmosphere. Combustion of fossil fuels has steadily increased the amount of carbon dioxide, they said. The experts explained that the gas acts very much like the glass in a greenhouse, permitting the sunlight to penetrate and warm the earth and preventing excess heat from radiating back into space. Any accumulation of carbon dioxide will eventually warm the climate—particularly at the high altitudes.

Deforestation was discussed as an international concern because any such large scale activity would affect climate elsewhere. Trees, as they grow, remove carbon dioxide from the atmosphere and store it in their wood and leaves. Much of that carbon dioxide is returned to the air when the trees are cut down and burned or decay. Scientists attributed a large part of the recent increase of carbon dioxide to the destruction of woodland.

The scientists also noted that increasing use of nitrogen-based fertilizers could add enough oxides of nitrogen to the atmosphere to cause additional warming.

Their statement was explicit: "We can say with some confidence that the burning of fossil fuels, deforestation and changes of land use have increased the amount of carbon dioxide in the atmosphere by about 15 percent during the last century."

WILLIAM G. MAHONEY

Swedish paper companies are | Environmental pressed to speed cleanup

STOCKHOLM—Swedish pulp and paper companies must invest an estimated 1.1 billion Swedish crowns (\$253,450,000) during the next five years on measures to protect the environment, according to an industry association report.

Initially during this period, the industry would like to move along at a slower pace until completion by 1981 of research into the effect of pollution discharges from the mills and at the same time test new methods of recycling and cleansing waste before introduction on a large scale.

"We want to avoid big investments in new untried techniques," Bo Wergens, managing director of the Pulp and Paper Mill Association, told the press when presenting the industry's invest-

ment needs.

Sweden's Environment Protection Board, however, is pressing for faster action and a bigger investment. It wants the industry to spend 1.4 billion (\$322,580,000). By applying the best techniques available at present, the agency said in its long-term study, paper and pulp plants would be able to meet today's environmental SPECIAL TO WER protection demands by 1985.

Swedes asked to map pollutants in Arabian Gulf by UNEP

STOCKHOLM-The Arabian (Persian) Gulf nations are concerned about the gulf's environmental health, and so a Swedish organization has been asked to map pollutants in the world's main oil tanker route-and forecast its future development.

Sweden's semi-official Institute for Research into the Care of Water and the Atmosphere (IVL) will begin in June—if political conditions permit. The Swedish researchers will have approximately six million Swedish Crowns (\$1.4 million) at their disposal and are to complete the project within 21 months. The program is under the direction of the United Nations Environment Program

In discussing the assignment with the Swedish press, IVL project leader Professor Arne Jerneloev told newsmen that the Persian Gulf already has been affected by pollution, especially oil, and the area's fast-growing petro-chemical industries. "If no regard is taken for the environment, the situation rapidly will become worse," he said.

IVL has applied its knowledge and technique in recent years in connection with several major oil catastrophes abroad. The company cooperates closely with sister institutes in Denmark and Norway. Under a contractual agreement, they already are working together on a project to safeguard drinking water at Casablanca in Morocco, and they will soon tackle the problems of quicksilver in Thailand and water pollution in Cartagena, Colombia. SPECIAL TO WER

Legislation ...

SWEDEN'S PRODUCTS CONTROL BOARD has banned two chemicals used to fight weeds on grounds that there is a risk they could cause cancer and have damaging effects on the fetus.

Called TOK E 25 and TOK W 50, both contain a compound named nitrofen. The chemicals were given clearance in 1965 because tests at that time failed to show any serious side-effects. However, the Board said new information now has come to its attention and consequently it decided to withdraw the license to sell or use the chemicals. In 1977, 26,000 liters were applied to 17,200 acres. The Board said substitutes were available.

A CHILEAN FOREIGN MINISTRY spokesman said that Chile will soon ratify its membership in the International Whaling Commission.

Chile's catch for 1977 (the last year for which figures are available) was 76 whales. In 1976 the catch was 87 and in 1975 it was 106, according to

the Foreign Ministry spokesman.

The Chilean government hopes that the Commission, which now has a zero quota for Peru and Chile, will examine scientific data to be presented by Chile and reconsider its quota. Only one firm in Chile is currently licensed to hunt whales in Chilean territorial waters, the Macava Brothers of Talcahuano.

Peru, which kills about 1,000 whales a year, has not yet deposited its instruments of ratification with the IWC, said the Chilean

THREE FACTORIES IN KWEILIN, a famous scenic spot in China, have been ordered to stop operations and another to close down because of industrial pollution, the New China News Agency said.

Kweilin is renowned for its dramatic landscape, clear rivers and magnificent caves. However, in the past few years, industrial wastes have badly polluted the river, some of the rocks have whitened and many trees withered. Most of the fishermen in the area have turned to

other occupations.

The news agency reported that it has been decided that all plants in the area should control pollution within a specified time. Those factories that demonstrate no progress must be removed to other places or be used for other purposes. No new plant or expansion of any kind will be allowed in the future without permission.

Environmental Management...

IN KENYA lack of environmental management has led to pollution of rivers, disappearance of forests, encroachment of deserts, shortage of cultivable land, poverty, hunger, unemployment and a severe urban housing problem.

This was said by Michael Njenga, director of Kenya's National Environmental Secretariat—a government-backed organization—at a national symposium on environmental education in Nairobi.

Delegates, including educationists, social workers and environmentalists, agreed that greater emphasis was needed on environmental matters in Kenya's education system at all levels—including in the mass media.

PHILIPPINE PRESIDENT Ferdinand Marcos has set up a committee to develop and implement immediately a plan for solid waste management and resource recovery in the city of Manila.

Marcos explained that environmental quality and public health have become matters of vital concern to the government, and the accumulation of solid wastes caused by the increasing population and growth in resource consumption is further aggravating the ecological problems in Manila and its environs. The master plan for solid waste management is aimed at the collection and disposal of garbage, to eliminate their nuisance and danger to public health, and maximize recovery from solid waste.

THE MALAYSIAN GOVERNMENT has developed a three-point strategy—short-term, midterm, and long-term measures—against pollution in the country over the next 10 years, Science, Technology and Environment Minister Tan Sri Ong Kee Hui said.

Tan Sri Ong said the three measures will cover the control of water and air pollution, the provision of guidelines for planning and development agencies and the protection of the qualify of life of people affected by development projects in the country. Also, a nationwide water and air quality management program will be launched to complement the implementation of these measures.

The Ministry's Environment Division has set up an inter-departmental committee to make recommendations for improving the present method of waste disposal. A similar committee will be set up shortly to advise the division on formulating regulations for the control of marine and noise pollution, Tan Sri Ong said.

UNEP Environment Fund running \$30.5 million short of target

NAIROBI—United Nations Environment Program executive director Mostafa K. Tolba warns, in a report to be presented to the seventh UNEP General Council in Nairobi on April 18, that estimated resources for the UNEP Fund for the 1978-81 period are \$30.5 million short of the \$150 million target set by the Governing Council in 1977. "The modest amount of resources required surely cannot be considered as posing any insuperable obstacle," he adds. But some major donors have recently warned that the \$150 million target is unlikely to be achieved.

The Environment Fund depends on the voluntary contributions of member-states. But Jess than half the U.N. member-states are contributing and 14 developing countries (Botswana, China, Cuba Egypt, India, Ivory Coast, Jamaica, Jordan, Liberia, Morocco, Oman, Qatar, Saudi Arabia and Swaziland) which have contributed in the past have announced no pledges for 1978 and onwards. Venezuela reduced its 1977 contribution by \$20,000.

However, ten developing countries pledged contributions in 1978 for the first time; 15 countries (10 developed and 7 developing) increased their pledges; and 48 countries maintained their 1978 pledges at 1977 levels.

Problems of the shortfall are increased by the need to spend considerable sums which are contributed in non-convertible currencies (mainly by the Eastern Bloc states).

Dr. Tolba warns that the Fund is approaching a turning point in 1979-80, and the Governing Council must give concrete guidance on future policy. He says 1978 was the first year in which the availability of resources became a serious constraint on the development of the Fund program.

CHARLES HARRISON

Egypt's Mohamed El Kassas discusses desertification

CAIRO—Scientists and planners the world over are at last mobilizing to combat the ominous growth of the desert, and this is due in no small measure to the efforts of a softspoken, unassuming Egyptian botany professor.

He is 58-year-old Mohamed El Kassas who, more than 30 years ago, started to study plant life in the Egyptian and Sudanese deserts. Since then, in classrooms, international scientific societies, and learned journals, he has been warning man of the dangers that will befall him if he continues to abuse natural barriers to desertification. Last year he won the International Pahlavi Environment Prize for his outstanding contribution.

"It's often thought that deserts creep or spread across cultivated fields and, like invading armies, sand dunes conquer fertile lands. But it doesn't happen that way at all," he explains. "What does occur is that through over-grazing and over-cutting of trees and brush, as well as through neglect of soil and water conservation,

the eco-system of the fertile areas is destroyed from within and then they turn into desert."

He is the current president of the International Union for Conservation of Nature and Natural Resources (IUCN), a 30-year-old organization with 430 members representing 100 countries. Dr. Kassas, the first scientist from the developing world to serve as president, wants to use his position to focus world attention on the need for conservation in arid lands.

He helped plan the 1977 UN-sponsored conference in Nairobi on desertification but has not been satisfied with subsequent international response. He estimates it will take at least \$1.5 billion a year for the next 20 years to reclaim land now being lost to the desert and to educate everyone—from nomad to policy-maker. To raise the money, he has called for an international system of taxation.

Although he has been deeply involved in United Nations projects over the years, Dr. Kassas believes "the most important thing is to build up each country's indigenous capacities. This is more important than outside help in the form of food or money. Of course, research is useful, but the basic technologies are already known. It's more important to apply existing knowledge than to enlist more experts."

NATHANIEL HARRISON

South African scientists desalt Namibia's water



JOHANNESBURG—Mineral-rich Namibia is critically short of one major resource, water.

South Africa's National Institute for Water Research (NIWR), based in Pretoria, is now coming to grips with the problem, and its innovations may have relevance to other arid areas of the world.

The capital, Windhoek, since the early 1960s has been the first municipality in the world to drink its own purified sewage. Ten percent of its water is purified effluent.

But the NIWR's most important area of research is mapping the territory's groundwater supplies—20 percent of the area and 20,900 sources have now been mapped, tested and computerized. And much of it is too highly mineralized even for animals.

Desalination is therefore necessary, and the NIWR has researched solar desalination. With South Africa's Department of Water Affairs it has published a do-it-yourself manual on how to make a solar still that will produce drinking water in low rainfall areas where groundwater is highly mineralized. (Large areas of

Water wise ...

THE CITY OF CARACAS has been suffering from water shortages for several months. Some Venezuelans charge it is not just drought, the water system is simply inadequate to serve peoples' needs. As a result, some local and national politicians fell out of favor in the recent elections.

Last week Jose Curiel, chief of a transition team working with the Environment Ministry's engineers, stated that contrary to previous announcements, water shortages would continue. He said Caracas' water reserves were at an alarming low.

Minister Arnoldo Jose Gabaldon confirmed the news a few days later, saying the rationing of water in parts of Caracas will continue until March. It also was announced that due to the low level of Caracas' water reserves, the water supply would be cut entirely in some parts of the city during weekends.

The rainy season usually starts at the end of June and lasts till September.

THE PHILIPPINE GOVERNMENT will manufacture solar cells to power portable irrigation pumps in rural areas this year. Technical requirements of the \$203,000 project are being undertaken by the Philippine Atomic Energy Commission.

The government also plans to utilize agriculture wastes to produce gas for running irrigation pumps.

DROUGHT has cut the South African maize crop of 1978/9 to less than 8 million tons. Last year's crop was nearly 10 million tons.

THE WESTERN AUSTRALIAN government has refused to let the United States carry out a cloud-seeding project on cyclones.

U.S. scientists overseeing the National Oceanic and Atmospheric Administration's project "Stormfury" had planned to seed cyclone clouds in an attempt to release latent heat, which would widen the eye of the cyclone and thus dissipate winds. Similar experiments on American hurricanes have been carried out in the 18-year-old project.

The Minister for Regional Administration, Des O'Neil, informed the federal ministry of science that Western Australia benefitted more from cyclonic rainfall than it suffered from wind damage. There were fears that this experimental control of cyclones, and especially their wind force, would reduce rainfall or change the cyclones' courses, due to the seeding. Project "Stormfury" had been expected to start here later this year.

Down under . . .

IT'S BEEN A BOOM YEAR for Queensland's wheat crop, and some of Australia's exotic wildlife is eating up the profits.

A record 1.98 million tons of wheat—three times last year's crop—has been harvested. But wild pigs, emus, rats, mice, cockatoos and weevils are devouring tons of the grain awaiting shipment in temporary silos on the farms.

The make-shift silos have been damaged by the foraging creatures while the crop awaits removal by the Australian Wheat Board. In some areas, the pests have already been feasting for three months. And while electric fences can keep out the pigs and wide-eyed emus, weevils can't be fumigated out of the temporary silos.

The Australian Wheat Board recently closed a \$900 million sale to China of 8.25 million tons of wheat for the next three years.

SOUTH AUSTRALIA will not back down on the moratorium on uranium mining imposed 18 months ago.

State Premier Don Dunstan returned to Adelaide from a two-week fact-finding mission to Europe and announced that his Labor government could see no major developments which suggested nuclear safeguards—including its particular concern, the disposal of nuclear waste—were any safer than the situation under which the mining of uranium was banned in South Australia.

A week after his announcement, Mr. Dunstan resigned his post for reasons of ill-health. A Labor party convention several days later endorsed his stand and thus avoided taking the issue to a public referendum.

One large deposit in South Australia is the Beverly, which has 15,780 tons of low-grade (5.3 percent) uranium oxide. Only one uranium mine, the Mary Kathleen, is now producing uranium for export although construction of facilities is underway at the Northern Territory Ranger (100,350 tons, 7 percent uranium oxide) deposit.

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Namibia receive as little as 50 millimeters, 2 inches, of rain a year.)

Since distillation is of little practical use for industry, the NIWR investigated reverse osmosis. "The process has proved itself and is highly recommended," says the NIWR. It is now extending its research to desalting sea water at the coastal desert town of Swakopmund where there is a pilot plant.

Because of health dangers, especially to infants, high nitrate concentrations in groundwater at various places in the territory are a serious problem. The Institute recently developed a practical ion-exchange method to remove nitrate ions from water. The process is being evaluated.

Biological denitrification is a practical process for farmers, as higher nitrate levels are permissable for stock watering than for human consumption. In this process bacteria reduce the nitrate content by converting most of it to nitrogen gas which escapes to the atmosphere.

The process is aerobic and uses molasses as a carbon source. The process has proved successful in the laboratory and design criteria are being evaluated. The NIWR is producing a simple apparatus that can be made by farmers.

JAMES CLARKE

Australia to mine uranium in new national park

PERTH—A uranium deposit which lies wholly within the recently declared Kakadu National Park in Australia's Northern Territory is expected to go into production by 1981.

Noranda Australia Ltd. (the parent firm is Canadian) said in its environmental impact study that it will mine the Koongarra deposit, one of the smallest in Australia, for 12 years.

The company plans to dump waste acid tailings in a pond about 3 kilometers from the mine site, then cover it with water to a depth of 1.5 meters. At the end of the mine's life, the tailings will be covered by two meters of earth to cut radon gas emission. This plan is a concession to the government's recently toughened environmental demands. Original expectations were that tailings would be dumped in the hills behind the minesite—but the hills contain a major Aboriginal art site and tourist point. Other environmental concessions include the retention of contaminated ground water and rehabilitation of the area in a five-year program costing \$10 million.

The question of the escape of radon gas has also been raised in the case of Western Mining Corporation's Yeelirrie mine in Western Australia. The company is resisting vigorous opposition by environmentalists to its plans to store radioactive tailings in a surface dam, rather than putting the tailings in the mine itself after high-grade ore is extracted. The release of radon gas would be reduced 25 percent by doing the latter. But the corporation wants to mine the lower-grade ore at the bottom of the mine later. The tailings, in the corporation's preferred scheme, will be damped down in the dam with a 6.6 meter-thick wall, then covered with a 0.6 meter layer of soil and gravel.

JANE NACZYNSKI-PHILLIPS

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In This Issue...

Romania is exploring alternative sources of energy-with a one billion dollar Canadian loan agreement and Soviet cooperation.

A biogas plant in Romania produces not only energy, but fertilizer and fodder

The Communist economic group Comecon is expanding its nuclear capacity.

Swiss proposal to curb government's decision-making power on nuclear issues is narrowly defeated at the polls.

The first World Climate Conference issues a grave warning of a worldwide "greenhouse effect."

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In Namibia, South African scientists have methods to desalt and demineralize water for domestic and industrial uses.

Australia is going to mine uranium in a new national park.

Romania explores nuclear and oil shale energy resources

BUCHAREST-Romania, still the second largest European oil producer after the Soviet Untion—14.6 million tons in 1977—may be without its "black gold" in some ten years if new oil deposits are not found, government officials said. Economic planners have ordered development of "alternate forms of energy," including atomic power and oil shale, to save depleted domestic reserves of crude oil and natural gas.

The State Committee for Nuclear Energy of Romania and the Agency of Atomic Energy of Canada have signed several contracts for the building of nuclear power stations in this country.

The documents provide technical assistance for the construction of the first unit, including nuclear equipment, and the training of Romanian staff.

The deal was accompanied by the signing of a one-billion dollar loan agreement between the two countries in connection with the sale of four 600-megawatt nuclear reactors to Romania. The loan is the largest of its kind arranged through Canada's Export Development Co. for the sales of Canadian-produced goods and services. This is the first Canadian nuclear reactor sold to a Communist country, and the agreement follows several years of negotiations between Canada and Romania.

Romania intends to build up to 16 nuclear power static ns over 20 years to replace existing oil and coal plants. Plant ers say Romania will meet 20 percent of its energy needs with nuclear plant-produced energy by 1990.

Work at the first nuclear electric station, which will use natural uranium, could start this year.

"The signing of the documents is an important step in the development and expansion of nuclear cooperation between Canada and Romania...for the peaceful use of atomic energy," the Romanian official press agency said.

Romania is also cooperating with the Soviet Union for the joint construction of a 440-megawatt nuclear power plant. The design and construction of the plant is to be done by Romanian specialized enterprises. The plant will use enriched uranium to produce about 2.6 billion KWH of electricity a year, according to press accounts.

Meanwhile, the construction of a 990-megawatt electric plant to be fueled by oil shale started last year. The plant, described as a "world premiere," will burn some 12 million tons of shale annually, to be extracted in south-western Romania at Anina, where the plant will be located. SPECIAL TO WER

Energy Sources...

THE EUROPEAN COMMUNITY (EC) has approved aid totalling 5 million European Units of Account (about \$6.5 million) for uranium exploration projects in the nine countries of the EC. The aid, given to private firms selected after tender offers to the EC, is intended for programs undertaken between 1979 and 1981.

This is the fourth such program since 1976 when 1 million EUA in aid resulted in seven uranium prospecting projects, including the one in Kvanefjeld, Greenland, where substantial uranium deposits were discovered. The second and third exploration projects each got 5 million EUA in aid.

BRITAIN IS INVESTING more money in the

production of oil from coal.

In an agreement signed last month with the National Coal Board, Mr. Alex Eadie, Parliamentary Under Secretary of State for Energy, promised a government contribution of up to £800,000 (\$1.6 million) towards the estimated £1.2 million (\$2.4 million) cost of preparatory work on two pilot plants for converting coal.

At the next phase, the government would be prepared to contribute up to £20 million (\$40 million) of the estimated £30 million (\$60 million) construction cost of the two 25 ton-a-

day plants.

The government promised investment support for projects converting coal into gasoline, substitute natural gas and raw materials for the chemical industry following the recommendations of one of its working party reports* on future coal technology, published in May, 1978.

*Coal Technology—Future Developments in Conversion, Utilisation and Unconventional Mining in the United Kingdom". Available free of charge from The Library, Department of Energy, Thames House South, Millbank, London SW1P 4QJ.

THE INDIAN INSTITUTE OF TECHNOLOGY has announced that it has developed the most efficient photovoltaic solar cell to date. Dr. K. L. Chopra, the physicist who developed the cadmium sulphide cell, states that it is many times cheaper to produce than silicon cells and is capable of converting sunlight to electricity with 11 percent efficiency, the highest rate yet achieved. Dr. Chopra states that the CDS cells should be available for commercial production in about five years.

Energy, fertilizer, and feed

from Romanian

biogas plant



BUCHAREST—Romanian researchers are changing pig farming wastes to fuel. A pilot station for obtaining biogas—a fuel gas that contains 80% methane and the remainder carbon oxide and dioxide—from pig feces was recently set up at Peris, near Bucharest, the Romanian Communist party organ, Scinteia, reported this month.

The complex, placed near a station for filtering waste waters from the Peris pig breeding farm, can process the waste from 5,000 pigs, and produce some 500 cubic meters of biogas a day, corresponding to a power equivalent of 3.25 million kilocalories a day. It reportedly saves 75-80 tons of fuel oil a year. To speed the process, methanogenic bacteria are introduced into the wastes. Fermentation time is shortened from 35 days to one week.

The discovery will soon be applied on a national scale and according to specialists, "tens of thousands" of tons of oil products could be saved by using biogas resulting from the major

pig breeding farms in Romania.

Eng. Gh. Stoica, scientific director of the Research Institute for Food Industry and Chemistry said the sludge obtained after fermentation can be used as a "best quality" fertilizer, is rich in proteins and vitamins of the B 12 group and has biostimulating characteristics. The mud, which is stabilized and has no smell, can be mixed with fodder in various amounts and used with good results in pig raising.

SPECIAL TO WER

East-bloc Comecon group expanding nuclear plans

EAST BERLIN—Member states of Comecon, the Communist economic grouping that in a limited manner parallels the Common Market, are actively expanding their nuclear power station capacities, according to a Soviet nuclear energy official.

Prof. Nikolai Sinev, a member of the Soviet State Committee for Nuclear Energy, wrote in the latest issue of the East German Army weekly "Volksarmee" that Comecon nuclear power stations now have a total capacity of 10,340 megawatts.

But, Sinev explained, this will be increased and the planned expansion of nuclear power capacity will permit Comecon states

to reduce imports of expensive fuels.

He said that the Soviet Union presently has 12 nuclear power stations that produce a total of 8,000 megawatts. However, the

present Soviet five-year plan foresees construction that will provide an additional 13,800 megawatt capacity, he wrote.

The article said that the first stage power plant in Kosludui, Bulgaria, produced 800 megawatts and this plant is now being expanded.

In Czechoslovakia where four blocks of a complex are under construction, he said, this center will eventually produce 1,760 megawatts.

East Germany, with its "Nord" plant, has three reactors that since 1978 have been producing 1,320 megawatts, according to Siney.

The Pecs reactor in Hungary is scheduled to reach 1,760-megawatt output in 1984, Sinev wrote.

The article stated that nuclear power stations were also under construction in Poland, Romania and Cuba. SPECIAL TO WER

Swiss approve nuclear plans in close referendum

GENEVA—In a national referendum voters narrowly defeated a proposal that could have effectively banned new nuclear power stations in Switzerland. It was a slim victory for the government and industry. After months of public debate nearly two million people voted, and the margin against the proposal was only about 45,000.

The government had lobbied actively in favor of its nuclear energy program after the Austrian example. There, in a similar referendum last November, voters decided very narrowly against putting Austria's first nuclear power station at Zwentendorf into operation.

The Swiss proposal was aimed at curbing the government's power to decide whether to build nuclear power stations and, if so, where they should be located.

The proposal arose from a private citizen's initiative for a Constitutional amendment sponsored by Swiss environmentalists and backed by 123,000 signatures. Voters were asked to choose between three possible courses: first, decision making powers in nuclear energy policy should remain as they are; second, the powers should be shifted from the government (Federal Council—the executive arm) to the Federal Parliament; or third, veto powers over the operation of a power station should be given to local voters near the station site. The Swiss chose the first course.

The government said it needs the nuclear energy program in order to meet energy needs until the end of the century. Some 20 percent of Switzerland's electricity is nuclear generated and, to lessen its dependence on oil, the government says it must build even more: three are in operation, two under construction and five nuclear plants are planned.

It would be premature to see in the Swiss vote any waning of nuclear opposition in Western Europe—where the debate has tumbled governments and damaged political careers (see WER, Jan. 1). But energy needs create political expediency. The French cabinet earlier this month decided to speed construction of

In Europe ...

SWITZERLAND'S EFFORTS to curb noise pollution from road traffic have gone far beyond recommendations and standards established by such international institutions as the Economic Commission for Europe or the European Community.

This country's largest automobile club—the Touring Club Suisse—found that Switzerland was also more demanding than other leading countries, such as the United States and Japan. Furthermore, it said, still lower ceilings on permissable noise will be imposed in the future.

TWO FRENCH CONGLOMERATES have been awarded contracts by the government to study the feasibility of constructing a 100,000-kilowatt power plant supplied with energy generated by thermal gradients in ocean waters. One conglomerate, Compagnie Generale d'Electricite (CGE), will study the possibility of building the power station at sea. The other, Creusot-Loire, will submit a study theorizing its construction on land. Both studies will be ready, according to the French government agency awarding the contracts, le Centre National pour l'Exploitation des Oceans (CNEXO), in early 1980, and construction could begin shortly thereafter, with completion scheduled for 1983-84. The studies are the first of their kind supported by the French government.

swedish environmental action groups have joined together to form a new political party—the Environment Party. It will not campaign on a national basis, however. Its candidates will run for office only in the Stockholm County Council elections next September. The program drawn up so far includes opposition to nuclear power plants, a ban on the sale and use of goods which could lead to pollution or damage the environment, and an inner city free of traffic.

A WORLD HEALTH ORGANIZATION group, in collaboration with the Dutch government, will meet at Bilthoven, The Netherlands, April 3-6 to examine the chronic and sublethal effects of air pollution in private dwellings and enclosed public areas. This includes schools, theaters, restaurants, stores, halls and waiting rooms. The study will not include hospitals and other health care buildings which are already covered by standards.

Forestry ...

THE PHILIPPINE MINISTRY of Natural Resources recently announced that 242,636 hectares of barren areas in the country have been reforested since 1966.

From 1966 to 1971, the average annual rate of reforestation was 7,252 hectares. Starting in 1972, when martial law was proclaimed, to 1978, the government reforested 199,122 hectares, an average of 28,446 hectares annually. In 1978 alone, 78,425 hectares were reforested by the government and the private sector. This is the highest record so far achieved in reforestation for one year.

BECAUSE MORE THAN FOUR MILLION hectares of forest land have been lost in India over the last 25 years, the government is planning to revise its forest policy by introducing environmental aspects before allowing river valley clearing projects.

The National Commission of Agriculture has suggested that if deforestation is essential for some purpose, the state legislatures should give their approval.

A recent survey has shown that of the total area lost, 50 percent went for agricultural purposes. River valley projects and rehabilitation of displaced persons took a major chunk of forest land. Industries took away over 120,000 hectares and another 57,000 hectares for road construction.

The total forested area is now estimated at 75 million hectares, about 23 percent of the geographical areas.

CHINA HAS ANNOUNCED that it will take urgent measures to revitalize its forestry industry. At present, forested land accounts for only 12.7 percent of the country's total land surface giving an average of 0.32 acre (0.13 hectare) of trees per capita. Only 69.16 million acres (29 million hectares) of saplings have been planted since 1949 and 197.6 million acres (80 million hectares) of wasteland and barren hills suitable for growing trees have not yet been afforested. Some 1.98 million acres (800,000 hectares) of cutover forest in the major forest regions have also not been reforested.

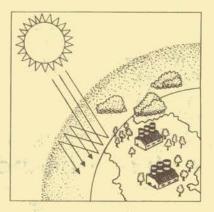
THE WORLDWATCH INSTITUTE recently published another in its series of environmental papers which may be of interest to WER readers. It is titled "Planting for the Future: Forestry for Human Needs," by Erik Eckholm, and has a most worthwhile section on some successful community forestry programs in China, India and, in particular, South Korea. Copies at \$2 each are available from the institute at 1776 Massachusetts Ave., N.W., Washington, D.C. 20036, U.S.A.

nuclear power plants because of dwindling world oil and natural gas supplies. Comecon nations are also actively expanding nuclear power capacities.

The Swiss government has no illusions that the issue is now settled. It faces another referendum test of its nuclear energy policy in May, when a revision of Switzerland's atomic energy legislation must be put to the voters for their approval.

WILLIAM G. MAHONEY

World Climate Conference sees dangerous warming trend



GENEVA—Some 300 scientists from 50 countries warned here at the conclusion of the first-ever World Climate Conference (24 Feb.) that mankind's indiscriminate use of fossil fuel, felling of timber and use of artificial fertilizers threatened serious damage to the global environment.

The statement concluding the two-week meeting added that only joint action by all states could halt and reverse the trend. The conference was organized by a United Nations agency, the World Meteorological Organization (WMO).

The experts agreed that the worst problem was the increase of carbon dioxide in the atmosphere. Combustion of fossil fuels has steadily increased the amount of carbon dioxide, they said. The experts explained that the gas acts very much like the glass in a greenhouse, permitting the sunlight to penetrate and warm the earth and preventing excess heat from radiating back into space. Any accumulation of carbon dioxide will eventually warm the climate—particularly at the high altitudes.

Deforestation was discussed as an international concern because any such large scale activity would affect climate elsewhere. Trees, as they grow, remove carbon dioxide from the atmosphere and store it in their wood and leaves. Much of that carbon dioxide is returned to the air when the trees are cut down and burned or decay. Scientists attributed a large part of the recent increase of carbon dioxide to the destruction of woodland.

The scientists also noted that increasing use of nitrogen-based fertilizers could add enough oxides of nitrogen to the atmosphere to cause additional warming.

Their statement was explicit: "We can say with some confidence that the burning of fossil fuels, deforestation and changes of land use have increased the amount of carbon dioxide in the atmosphere by about 15 percent during the last century."

WILLIAM G. MAHONEY

Swedish paper companies are pressed to speed cleanup

STOCKHOLM—Swedish pulp and paper companies must invest an estimated 1.1 billion Swedish crowns (\$253,450,000) during the next five years on measures to protect the environment, according to an industry association report.

Initially during this period, the industry would like to move along at a slower pace until completion by 1981 of research into the effect of pollution discharges from the mills and at the same time test new methods of recycling and cleansing waste before introduction on a large scale.

"We want to avoid big investments in new untried techniques," Bo Wergens, managing director of the Pulp and Paper Mill Association, told the press when presenting the industry's investment needs.

Sweden's Environment Protection Board, however, is pressing for faster action and a bigger investment. It wants the industry to spend 1.4 billion (\$322,580,000). By applying the best techniques available at present, the agency said in its long-term study, paper and pulp plants would be able to meet today's environmental protection demands by 1985.

SPECIAL TO WER

Swedes asked to map pollutants in Arabian Gulf by UNEP

STOCKHOLM—The Arabian (Persian) Gulf nations are concerned about the gulf's environmental health, and so a Swedish organization has been asked to map pollutants in the world's main oil tanker route—and forecast its future development.

Sweden's semi-official Institute for Research into the Care of Water and the Atmosphere (IVL) will begin in June—if political conditions permit. The Swedish researchers will have approximately six million Swedish Crowns (\$1.4 million) at their disposal and are to complete the project within 21 months. The program is under the direction of the United Nations Environment Program (UNEP).

In discussing the assignment with the Swedish press, IVL project leader Professor Arne Jerneloev told newsmen that the Persian Gulf already has been affected by pollution, especially oil, and the area's fast-growing petro-chemical industries. "If no regard is taken for the environment, the situation rapidly will become worse," he said.

IVL has applied its knowledge and technique in recent years in connection with several major oil catastrophes abroad. The company cooperates closely with sister institutes in Denmark and Norway. Under a contractual agreement, they already are working together on a project to safeguard drinking water at Casablanca in Morocco, and they will soon tackle the problems of quicksilver in Thailand and water pollution in Cartagena, Colombia.

SPECIAL TO WER

Environmental Legislation . . .

sweden's products control board has banned two chemicals used to fight weeds on grounds that there is a risk they could cause cancer and have damaging effects on the fetus.

Called TOK E 25 and TOK W 50, both contain a compound named nitrofen. The chemicals were given clearance in 1965 because tests at that time failed to show any serious side-effects. However, the Board said new information now has come to its attention and consequently it decided to withdraw the license to sell or use the chemicals. In 1977, 26,000 liters were applied to 17,200 acres. The Board said substitutes were available.

A CHILEAN FOREIGN MINISTRY spokesman said that Chile will soon ratify its membership in the International Whaling Commission.

Chile's catch for 1977 (the last year for which figures are available) was 76 whales. In 1976 the catch was 87 and in 1975 it was 106, according to the Foreign Ministry spokesman.

The Chilean government hopes that the Commission, which now has a zero quota for Peru and Chile, will examine scientific data to be presented by Chile and reconsider its quota. Only one firm in Chile is currently licensed to hunt whales in Chilean territorial waters, the Macaya Brothers of Talcahuano.

Peru, which kills about 1,000 whales a year, has not yet deposited its instruments of ratification with the IWC, said the Chilean source.

THREE FACTORIES IN KWEILIN, a famous scenic spot in China, have been ordered to stop operations and another to close down because of industrial pollution, the New China News Agency said.

Kweilin is renowned for its dramatic landscape, clear rivers and magnificent caves. However, in the past few years, industrial wastes have badly polluted the river, some of the rocks have whitened and many trees withered. Most of the fishermen in the area have turned to other occupations.

The news agency reported that it has been decided that all plants in the area should control pollution within a specified time. Those factories that demonstrate no progress must be removed to other places or be used for other purposes. No new plant or expansion of any kind will be allowed in the future without permission.

Environmental Management . . .

IN KENYA lack of environmental management has led to pollution of rivers, disappearance of forests, encroachment of deserts, shortage of cultivable land, poverty, hunger, unemployment and a severe urban housing problem.

This was said by Michael Njenga, director of Kenya's National Environmental Secretariat—a government-backed organization—at a national symposium on environmental education in Nairobi.

Delegates, including educationists, social workers and environmentalists, agreed that greater emphasis was needed on environmental matters in Kenya's education system at all levels—including in the mass media.

PHILIPPINE PRESIDENT Ferdinand Marcos has set up a committee to develop and implement immediately a plan for solid waste management and resource recovery in the city of Manila.

Marcos explained that environmental quality and public health have become matters of vital concern to the government, and the accumulation of solid wastes caused by the increasing population and growth in resource consumption is further aggravating the ecological problems in Manila and its environs. The master plan for solid waste management is aimed at the collection and disposal of garbage, to eliminate their nuisance and danger to public health, and maximize recovery from solid waste.

THE MALAYSIAN GOVERNMENT has developed a three-point strategy—short-term, midterm, and long-term measures—against pollution in the country over the next 10 years, Science, Technology and Environment Minister Tan Sri Ong Kee Hui said.

Tan Sri Ong said the three measures will cover the control of water and air pollution, the provision of guidelines for planning and development agencies and the protection of the qualify of life of people affected by development projects in the country. Also, a nationwide water and air quality management program will be launched to complement the implementation of these measures.

The Ministry's Environment Division has set up an inter-departmental committee to make recommendations for improving the present method of waste disposal. A similar committee will be set up shortly to advise the division on formulating regulations for the control of marine and noise pollution, Tan Sri Ong said.

UNEP Environment Fund running \$30.5 million short of target

NAIROBI—United Nations Environment Program executive director Mostafa K. Tolba warns, in a report to be presented to the seventh UNEP General Council in Nairobi on April 18, that estimated resources for the UNEP Fund for the 1978-81 period are \$30.5 million short of the \$150 million target set by the Governing Council in 1977. "The modest amount of resources required surely cannot be considered as posing any insuperable obstacle," he adds. But some major donors have recently warned that the \$150 million target is unlikely to be achieved.

The Environment Fund depends on the voluntary contributions of member-states. But less than half the U.N. member-states are contributing and 14 developing countries (Botswana, China, Cuba, Egypt, India, Ivory Coast, Jamaica, Jordan, Liberia, Morocco, Oman, Qatar, Saudi Arabia and Swaziland) which have contributed in the past have announced no pledges for 1978 and onwards. Venezuela reduced its 1977 contribution by \$20,000.

However, ten developing countries pledged contributions in 1978 for the first time; 17 countries (10 developed and 7 developing) increased their pledges; and 48 countries maintained their 1978 pledges at 1977 levels.

Problems of the shortfall are increased by the need to spend considerable sums which are contributed in non-convertible currencies (mainly by the Eastern Bloc states).

Dr. Tolba warns that the Fund is approaching a turning point in 1979-80, and the Governing Council must give concrete guidance on future policy. He says 1978 was the first year in which the availability of resources became a serious constraint on the development of the Fund program.

CHARLES HARRISON

Egypt's Mohamed El Kassas discusses desertification

CAIRO—Scientists and planners the world over are at last mobilizing to combat the ominous growth of the desert, and this is due in no small measure to the efforts of a softspoken, unassuming Egyptian botany professor.

He is 58-year-old Mohamed El Kassas who, more than 30 years ago, started to study plant life in the Egyptian and Sudanese deserts. Since then, in classrooms, international scientific societies, and learned journals, he has been warning man of the dangers that will befall him if he continues to abuse natural barriers to desertification. Last year he won the International Pahlavi Environment Prize for his outstanding contribution.

"It's often thought that deserts creep or spread across cultivated fields and, like invading armies, sand dunes conquer fertile lands. But it doesn't happen that way at all," he explains. "What does occur is that through over-grazing and over-cutting of trees and brush, as well as through neglect of soil and water conservation,

the eco-system of the fertile areas is destroyed from within and then they turn into desert."

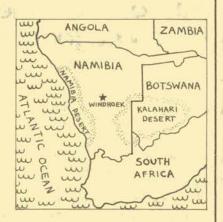
He is the current president of the International Union for Conservation of Nature and Natural Resources (IUCN), a 30-year-old organization with 430 members representing 100 countries. Dr. Kassas, the first scientist from the developing world to serve as president, wants to use his position to focus world attention on the need for conservation in arid lands.

He helped plan the 1977 UN-sponsored conference in Nairobi on desertification but has not been satisfied with subsequent international response. He estimates it will take at least \$1.5 billion a year for the next 20 years to reclaim land now being lost to the desert and to educate everyone—from nomad to policy-maker. To raise the money, he has called for an international system of taxation.

Although he has been deeply involved in United Nations projects over the years, Dr. Kassas believes "the most important thing is to build up each country's indigenous capacities. This is more important than outside help in the form of food or money. Of course, research is useful, but the basic technologies are already known. It's more important to apply existing knowledge than to enlist more experts."

NATHANIEL HARRISON

South African scientists desalt Namibia's water



JOHANNESBURG—Mineral-rich Namibia is critically short of one major resource, water.

South Africa's National Institute for Water Research (NIWR), based in Pretoria, is now coming to grips with the problem, and its innovations may have relevance to other arid areas of the world.

The capital, Windhoek, since the early 1960s has been the first municipality in the world to drink its own purified sewage. Ten percent of its water is purified effluent.

But the NIWR's most important area of research is mapping the territory's groundwater supplies—20 percent of the area and 20,900 sources have now been mapped, tested and computerized. And much of it is too highly mineralized even for animals.

Desalination is therefore necessary, and the NIWR has researched solar desalination. With South Africa's Department of Water Affairs it has published a do-it-yourself manual on how to make a solar still that will produce drinking water in low rainfall areas where groundwater is highly mineralized. (Large areas of

Water wise ...

THE CITY OF CARACAS has been suffering from water shortages for several months. Some Venezuelans charge it is not just drought, the water system is simply inadequate to serve peoples' needs. As a result, some local and national politicians fell out of favor in the recent elections.

Last week Jose Curiel, chief of a transition team working with the Environment Ministry's engineers, stated that contrary to previous announcements, water shortages would continue. He said Caracas' water reserves were at an alarming low.

Minister Arnoldo Jose Gabaldon confirmed the news a few days later, saying the rationing of water in parts of Caracas will continue until March. It also was announced that due to the low level of Caracas' water reserves, the water supply would be cut entirely in some parts of the city during weekends.

The rainy season usually starts at the end of June and lasts till September.

THE PHILIPPINE GOVERNMENT will manufacture solar cells to power portable irrigation pumps in rural areas this year. Technical requirements of the \$203,000 project are being undertaken by the Philippine Atomic Energy Commission.

The government also plans to utilize agriculture wastes to produce gas for running irrigation pumps.

DROUGHT has cut the South African maize crop of 1978/9 to less than 8 million tons. Last year's crop was nearly 10 million tons.

THE WESTERN AUSTRALIAN government has refused to let the United States carry out a cloud-seeding project on cyclones.

U.S. scientists overseeing the National Oceanic and Atmospheric Administration's project "Stormfury" had planned to seed cyclone clouds in an attempt to release latent heat, which would widen the eye of the cyclone and thus dissipate winds. Similar experiments on American hurricanes have been carried out in the 18-year-old project.

The Minister for Regional Administration, Des O'Neil, informed the federal ministry of science that Western Australia benefitted more from cyclonic rainfall than it suffered from wind damage. There were fears that this experimental control of cyclones, and especially their wind force, would reduce rainfall or change the cyclones' courses, due to the seeding. Project "Stormfury" had been expected to start here later this year.

Down under . . .

IT'S BEEN A BOOM YEAR for Queensland's wheat crop, and some of Australia's exotic wildlife is eating up the profits.

A record 1.98 million tons of wheat—three times last year's crop—has been harvested. But wild pigs, emus, rats, mice, cockatoos and weevils are devouring tons of the grain awaiting shipment in temporary silos on the farms.

The make-shift silos have been damaged by the foraging creatures while the crop awaits removal by the Australian Wheat Board. In some areas, the pests have already been feasting for three months. And while electric fences can keep out the pigs and wide-eyed emus, weevils can't be fumigated out of the temporary silos.

The Australian Wheat Board recently closed a \$900 million sale to China of 8.25 million tons of wheat for the next three years.

SOUTH AUSTRALIA will not back down on the moratorium on uranium mining imposed 18 months ago.

State Premier Don Dunstan returned to Adelaide from a two-week fact-finding mission to Europe and announced that his Labor government could see no major developments which suggested nuclear safeguards—including its particular concern, the disposal of nuclear waste—were any safer than the situation under which the mining of uranium was banned in South Australia.

A week after his announcement, Mr. Dunstan resigned his post for reasons of ill-health. A Labor party convention several days later endorsed his stand and thus avoided taking the issue to a public referendum.

One large deposit in South Australia is the Beverly, which has 15,780 tons of low-grade (5.3 percent) uranium oxide. Only one uranium mine, the Mary Kathleen, is now producing uranium for export although construction of facilities is underway at the Northern Territory Ranger (100,350 tons, 7 percent uranium oxide) deposit.

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Namibia receive as little as 50 millimeters, 2 inches, of rain a year.)

Since distillation is of little practical use for industry, the NIWR investigated reverse osmosis. "The process has proved itself and is highly recommended," says the NIWR. It is now extending its research to desalting sea water at the coastal desert town of Swakopmund where there is a pilot plant.

Because of health dangers, especially to infants, high nitrate concentrations in groundwater at various places in the territory are a serious problem. The Institute recently developed a practical ion-exchange method to remove nitrate ions from water. The process is being evaluated.

Biological denitrification is a practical process for farmers, as higher nitrate levels are permissable for stock watering than for human consumption. In this process bacteria reduce the nitrate content by converting most of it to nitrogen gas which escapes to the atmosphere.

The process is aerobic and uses molasses as a carbon source. The process has proved successful in the laboratory and design criteria are being evaluated. The NIWR is producing a simple apparatus that can be made by farmers.

JAMES CLARKE

Australia to mine uranium in new national park

PERTH—A uranium deposit which lies wholly within the recently declared Kakadu National Park in Australia's Northern Territory is expected to go into production by 1981.

Noranda Australia Ltd. (the parent firm is Canadian) said in its environmental impact study that it will mine the Koongarra deposit, one of the smallest in Australia, for 12 years.

The company plans to dump waste acid tailings in a pond about 3 kilometers from the mine site, then cover it with water to a depth of 1.5 meters. At the end of the mine's life, the tailings will be covered by two meters of earth to cut radon gas emission. This plan is a concession to the government's recently toughened environmental demands. Original expectations were that tailings would be dumped in the hills behind the minesite—but the hills contain a major Aboriginal art site and tourist point. Other environmental concessions include the retention of contaminated ground water and rehabilitation of the area in a five-year program costing \$10 million.

The question of the escape of radon gas has also been raised in the case of Western Mining Corporation's Yeelirrie mine in Western Australia. The company is resisting vigorous opposition by environmentalists to its plans to store radioactive tailings in a surface dam, rather than putting the tailings in the mine itself after high-grade ore is extracted. The release of radon gas would be reduced 25 percent by doing the latter. But the corporation wants to mine the lower-grade ore at the bottom of the mine later. The tailings, in the corporation's preferred scheme, will be damped down in the dam with a 6.6 meter-thick wall, then covered with a 0.6 meter layer of soil and gravel.

JANE NACZYNSKI-PHILLIPS

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Antarctic reactor waste buried in California

WASHINGTON—The last radioactive rock from the Antarctic's only nuclear reactor was offloaded and buried, probably temporarily, in California during the week of March 12th.

As the final 800 tons of crushed contaminated rock went into storage—all in all 14,200 tons of effluent-affected earth was dug up from the McMurdo Station site in Antarctica and shipped to the U.S.—the saga of "Nukey Poo" is ended, or almost.

In August 1960, the U.S. Congress authorized installation of a nuclear reactor run by the U.S. Navy at McMurdo Sound, a part of Antarctica over which New Zealand claims sovereignty. It was to provide power not only for U.S. military research but for the scientists of Operation Deepfreeze.

Martin Marietta Corporation was given the contract to build the nuclear plant for \$1.4 million but, according to an article written for the Bulletin of the Atomic Scientists, the total cost was nearer \$3 million. It was installed in the Antarctic summer of 1961-62 and nicknamed "Nukey Poo."

It was supposed to be the first of many nuclear power plants in that remote area, but over 10 years it became apparent that Nukey Poo was too expensive to run—in many ways.

According to Owen Wilkes and Robert Mann, who wrote about its problems for the Bulletin of Atomic Scientists, within a year of startup a hydrogen fire occurred within the containment tanks; no environmental contamination was publicly known to have occurred. The reactor was producing power only 80 percent of the time and, in 1971, the Navy began investigating geothermal power as an alternative—there is an active crater 40 kilometers from McMurdo.

Then, abruptly, Nukey Poo shut down in September 1972. In February of the following year "a fault" was blamed. Later in 1973 it was announced that the whole reactor would be dismantled, shipped back to the U.S. and buried in Georgia. "Some" radioactive soil would also have to be shipped back because the Antarctic Treaty bans leaving radioactive waste there.

The Secretary of the U.S. National Academy of Sciences committee on polar research said Nukey Poo was shut down because of "numerous malfunctions and its pollution potential." But the removal plans prepared by the Naval Nuclear Power Unit disclosed that leaks had taken place: in 11 years of operation, cracks had appeared in the containment vessels three times. And over the entire 11 years, slight radioactive effluent had run down a drain and into the soil. The U.S. Nuclear Regulatory Commission decided that all soil that had soaked up any radioactivity had to go. And, starting in 1977, it was shipped on the USNS Bland to Port Hueneme in California.

Eco-politics . . .

AN INTERNATIONAL GROUP of lawyers and academics, chaired by Nobel Peace Prize winner Sean MacBride, has condemned the Belgian government for concluding a deal with South Africa for the importation of nearly 2,000 tons of uranium to 'fuel' Belgium's nuclear power stations between now and 1991. MacBride, urging the Belgians to cancel the contract on humanitarian and anti-nuclear grounds, added that the Belgian government has reportedly loaned South Africa 1.3 billion Belgian francs (about \$43.3 million) for the development of uranium production.

A NATION-WIDE SURVEY has found that 35 percent of all Belgians consider the construction of additional nuclear power plants "absolutely essential." Some 12.7 percent of the population consider their construction "necessary," while 27 percent say they are "resolutely against" building more nuclear power stations in a nation that already generates a higher percentage (more than 25 percent) of its electricity by nuclear power than any other country in the world. Another 27 percent surveyed by the Belgian association of electricity companies, la Federation des Enterprises Electriques de Belgique, were without opinion.

THE FRENCH GOVERNMENT plans to tighten its laws governing theft of nuclear materials, increasing maximum penalties to several years imprisonment and millions of French francs in fines. The current maximum penalty, which applies only in cases of theft of mildly radioactive materials, is two months imprisonment and 10,800 French francs (about \$2,500) in fines. The old law, introduced in the late 1950s, was intended mainly to protect public health.

Under the new law, a draft of which the French government recently submitted to Parliament for debate, offenders would be punished for the theft of any sort of nuclear material. The government has proposed that the penalties upon conviction be "very heavy." It has recommended "several years imprisonment and several millions of francs in fines."

A MAJOR AGREEMENT on joint research and development of large-scale thermal storage systems has been signed by the nine-nation European Community (EC) and five other countries, including the United States. The agreement, called the Energy Storage Agreement, was drawn up by the Paris-based International Energy Agency (IEA).

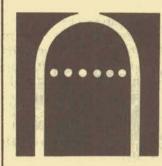
While details of the agreement were not available, sources said the participants, besides the U.S. and the EC, would be Sweden, Denmark, West Germany and Switzerland.

California officials protested but, after the state-commissioned study (by Scientific Services, Inc., the State Health Department, Stanford University and LFE Environmental Laboratories) found "the material as currently stored poses no hazard to man or the environment," the Navy was allowed to store it in an area sealed with liquid asphalt.

While the study recommended against continuous human contact with the crushed radioactive rock, it stated, "It may be used as road fill material, and may be safely handled by humans and machinery." The Navy is now preparing an application for approval by the Nuclear Regulatory Commission to use the material in an asphalt paved surface at Port Hueneme. If approved, construction will begin in July.

The Navy maintains the material is harmless, containing only "minute quantities of radionuclides...so insignificant that the radiation exposure levels are within typical naturally occurring levels throughout the U.S."

JUDITH H. DOBRZYNSKI



English researchers dispute government energy forecasts

LONDON—If Britain sticks to its current energy forecasts, around £30 billion (\$60 million) could be wasted over the next 30 years on power station construction and investment in the nuclear industry, says a recent report by the International Institute for Environment and Development (IIED).

The Department of Energy forecasts a 35 to 70 percent growth in energy use by the end of the century. The IIED report suggests 3 percent is more realistic.

"A Low Energy Strategy for the UK" (IIED, 10 Percy Street, London WI, £8) is the result of a two and a half year study led by IIED scientists and economist Gerald Leach. It was funded by a \$120,000 grant from the Ford Foundation, plus a small contribution from British Petroleum. After analyzing current energy consumption figures and conservation measures and trends, the IIED team report presumes it makes good economic sense to continue with these same energy conservation measures. For example, it says, by the year 2010, all homes should be insulated, domestic appliances will use half the power they now need, and in just 10 years cars should get double the miles per gallon.

The report argues it's unlikely there will be any dramatic change in lifestyle; it expects that the market will respond to higher energy prices by using less energy production. It suggests that rather than major expansion of the nuclear systems only about three or four nuclear stations would be needed. ALAN MASSAM

Irish court rules Viking site will be Dublin office building



DUBLIN—The lengthy battle to protect a Viking site here has been lost.

After a long legal wrangle, the country's Supreme Court gave Dublin Corporation permission to begin building civic offices at the Wood Quay site, the most important historical location in the nation's capital.

Wood Quay dates back to the very foundations of Dublin as a city. Archaeologists and other preservationists had staved off previous attempts by the corporation to begin construction work on the site (WER, Oct. 23, 1978, p. 4) while the local government claimed this was causing the cost of the building to increase.

Conservationists formed the Friends of Medieval Dublin and fought a number of court battles against the corporation, but in a decision handed down by the Supreme Court, previous legal victories for the preservationists were overturned.

Immediately after the decision, Dublin Corporation moved construction machinery onto the site and began work. As a compromise, it will build a museum for Viking artifacts.

TOM MacSWEENEY

Huge new Czechoslovak farms create environmental problems

PRAGUE—Czechoslovakia is transforming its landscape. Where once there were small family farms of half a hectare, there now are large cooperatives. And over the next 10 years, Czech authorities plan to restructure and integrate the nation's agricultural land to create huge cooperatives and state farms. Each will incorporate several villages.

Government experts say this switch to massive farms may mean that traditional environmental protection methods are no longer valid. To create fields big enough for large-scale farm equipment, forests will have to be cut. Roads will have to be realigned.

New anti-erosion methods will represent a major investment. Czechoslovak experts claim traditional anti-erosion measures are almost worthless for large-scale farms, but say they are working on new methods.

Government planners warn they expect to be at odds with environmentalists frequently over the necessity of cutting woodlands for large fields. But they say that while their objective is to create a highly productive countryside, this does not mean that environmental quality cannot be high as well. IVA DRAPALOVA

In Europe ...

CHRONIC TRAFFIC JAMS in Dublin are costing £2 million (\$4 million) a week in wasted fuel and lost business.

Ireland's capital-city businessmen have claimed that the traffic-choked city is costing over £100 million (\$200 million) a year in lost fuel and business and have demanded a new rapid-rail transport system. They say that it could pay for itself in two years at the present rate of loss.

The national transport company, CIE, has estimated that a rapid rail system would cost £5 million (\$10 million) per mile in Dublin, compared with between £20-30 million (\$40-60 million) in other European cities.

IN BRITAIN'S MAJOR CITIES blood lead levels are to be tested in a survey coordinated by the government Departments of the Environment and of Health and Social Security.

Some London boroughs and the cities of Birmingham, Leeds, Liverpool, Manchester, Sheffield and Glasgow will be included to give a representative national sample. Each local survey will cover an average of 200 adult volunteers. Children will be included in areas where high risk might be expected, such as near smelting works or busy road junctions.

The first phase begins this month with a

follow-up phase beginning in 1981.

Environmentalists have been calling for a reduction of lead in water, food and gasoline. Last year a pollution working party of the Conservation Society, claimed that the evidence implicating lead as a public health hazard was now so strong that the producers of lead that finds its way into the environment should be required to prove that it is doing no harm.

MORE THAN 70 WESTERN FIRMS took part in a two-week exhibition in Moscow last month, "Environmental Pollution Control '79," sponsored by the Soviet Chamber of Commerce and Industry.

Visitors to the exhibition at Moscow's Sokolniki Park had a chance to view mobile pollution-monitoring laboratory vans and a variety of automatic gas analyzers, dust-measuring nephelometers, laser systems, atomabsorption spectrophotometers and other sophisticated electronic apparatus for assessing pollution levels.

Among the 14 U.S. firms represented at the exhibition were Hewlett-Packard, Palo Alto, Calif.; Millipore Intertech, Bedford, Mass.; InterOcean Systems, Inc., San Diego, Calif.; and Aminco of Silver Spring, Md.

Recycling...

A HIGHLY AUTOMATED solid waste reprocessing plant now being put into operation in Minsk, the capital of Soviet Byelorussia, will be able to handle up to 400,000 metric tons of refuse a year.

The Soviet Communist Party newspaper Pravda said similar plants were also functioning in Moscow and Leningrad, while others were being planned for the Byelorussian city of Mogilyov and in Tashkent, capital of Uzbekistan in Soviet Central Asia.

The Minsk plant produces 100-kilogram compressed chunks of waste metal separated out of the refuse electromagnetically, as well as up to 60,000 tons of organic compost a year for fuel and fertilizer purposes.

A RECLAMATION PLANT for domestic and commercial refuse, said to be the first municipally owned one of its kind in Europe, is to be opened in June in Newcastle, England, by the Tyne and Wear County Council.

Built at a cost of £3.5 million (\$7 million), the Byker Reclamation Plant will process waste at the rate of 20 tons an hour over two shifts, or 300 tons a day. Initially it will recover unburnt ferrous metal, and pellets of waste derived fuel (WDF) equivalent to at least 30 percent of the weight of the original input.

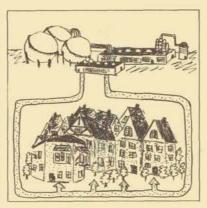
The WDF, which was test-marketed in 1976, will be conveyor-fed to an adjoining district heating boiler plant due to be completed later this year. Surplus will be sold commercially.

THE EAST GERMAN government has started a lottery as a special bonus for those who excel in collecting materials for reclamation and reuse. In addition, the collector is paid according to a government-set price list.

Organized search and collection of recyclable material dates back in Germany to Hitler's Deutsches Reich, when the economic machinery of World War II required total mobilization of the Reich's resources. The current regime is keeping up this collecting campaign.

Households in East Germany yielded during the first three quarters of 1978 some 180,000 (metric) tons of metal scrap and waste and over 120,000 tons of waste paper.

In East Germany, 75 percent of steel made is re-smelt material; the paper industry uses 43 percent recycled paper; textile plants blend 10 percent reuse fibers in new material, and between 60 and 70 percent of bottles and glasses newly delivered by factories are actually starting their second life.



Pioneer Danish town heated by chemical waste water

FREDERICIA, Denmark—This town of 33,000 inhabitants plans to be the first in Denmark—and possibly the world—to be almost entirely heated by a chemical factory's waste water.

A long-term agreement has been signed by the town and the Superfos chemical plant. Over the next three years Superfos will increase its delivery of waste water so that it provides nearly 100 percent of the town's heating needs.

The eventual savings of fuel oil is calculated at 30,000 tons annually, or \$3.5 million in foreign exchange. In 1977 waste water heat equalled 6,000 tons of oil; in 1978, 7,000 tons. It is estimated this will rise to 10,000 tons in 1979; 15,000 in 1980; 20,000 in 1981 and 30,000 tons by 1982.

The first Fredericia contract was signed in 1976, and this breakthrough was followed by similar agreements in other Danish towns.

Superfos provides the hot water free. It is the result of manufacturing nitric acid, a by-product of fertilizer making. The town's district heating system will have to invest the equivalent of \$6 million for an extension of the heating network, but part of this will be covered by a subsidy from the Danish Government, and the loan covering the rest will be serviced by savings in the cost of oil. Already heating charges to members of the system have been reduced, while elsewhere they are going up.

The additional waste water is being provided through expansion of the Superfos plant, said chief engineer Ole Jensen. He explained that hot water from the manufacturing process circulated through the district heating system and returned to the factory where it was cooled before being re-used for manufacturing.

CONSTANCE CORK

Water recycling systems used in large Japanese buildings

TOKYO—Many local governments in Japan now insist that installation of water supply recycling systems be an official requirement for construction permits for bigger buildings. These recycling systems purify all waste discharge water and then recirculate it for use once again.

There are at least 16 large buildings in the Tokyo area which boast such systems and more than 10 installations scheduled for construction are to have water recycling.

Large buildings not only consume vast amounts of water but often are located in districts where the public sewage systems are so overburdened that they are nearing the limits of their capacity. Japanese environment specialists have been strongly urging the administration of all major cities in recent months that mandatory introduction of building water recycling systems will greatly reduce the load on their public sewers and should thus become an indispensable part of all sewage programs in built-up areas.

However, Japanese metropolitan authorities are running into objections from real estate firms who object to putting in expensive piping and mains that they otherwise would not find necessary. And, apparently maintenance is costly. Some powerful real estate companies argue that although the water produced by such a system is not used either for drinking or cooking, it might be harmful if used for washing clothes or cleaning.

Nevertheless, it is the generally accepted belief in Japanese environmental circles that, despite all the difficulties, high costs and risks involved, eventually there will be few large buildings constructed in the country without water supply recycling systems.

A.E. CULLISON

Hong Kong introduces two new pollution control ordinances

HONG KONG—The rapid industrialization of the British colony of Hong Kong has brought about serious pollution problems. To control them, the government has just introduced two new ordinances.

The Air Pollution Control Ordinance and the Liquid Effluent Control Ordinance are two of five being drafted by the Environmental Protection Unit (EPU). The others cover noise abatement, solid waste disposal, and environmental impact assessments.

The government recognized the need to protect the environment as early as 1974 when it engaged consultants to draw up detailed recommendations for monitoring the environmental situation. After a two-year survey into existing pollution problems, the consultants recommended the drafting of new laws to control pollution in 1976. Various pollution control units like the Air Pollution Control Unit of the Labor Department and Marine Pollution Control Unit of the Marine Department have since been set up. In addition, the "Keep Hong Kong Clean" Campaign was organized.

Last year, the government set up a central agency, the Environmental Protection Unit (EPU), to monitor long-term trends, to formulate environmental policies, to coordinate the pollution control activities of various government agencies and to provide a technical advisory service to government and industry. EPU is now under the wing of the Environment Branch, but it will eventually become an independent body reporting directly to the Secretary of Environment.

Under the Air Pollution Control Ordinance, controls will be extended to include emissions from all types of industries. Three completely new areas—the composition of fuels, emissions other than smoke and grit, and the control of odors are covered.

SPECIAL TO WER

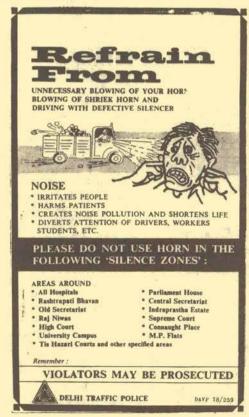
Environmental Legislation ...

AT THE FIRST MEETING of the recently formed Environmental Association of China, held in Chengtu, the capital of Szechuan, deputy prime minister Ku Mu told Peter Thacher, deputy executive director of the United Nations Environment Program, that China insisted the environment be taken into account during the planning of all industrial projects—plans that affect one-quarter of the earth's population.

CHINA has declared three more protected zones for pandas, golden monkeys and other wild animals in Szechwan province. The largest zone is southern Szechwan; it consists of 40,000 hectares of subtropical virgin forest. The other two zones are along the northern border.

A recent survey by Chinese zoologists found more than one thousand varieties of wild animals in Szechwan. All these animals are protected in the five protected zones already in existence.

NEW DELHI IS SO NOISY that the capital city's police have taken ads in Indian papers shushing drivers because "noise irritates people, harms patients, creates noise pollution and shortens life, diverts attention of drivers, workers, students, etc."



In Asia ...

A RETIRED THAI PHYSICIAN who helped to establish a system of national parks in Thailand, Dr. Boonsong Lekagul, has been chosen for the \$50,000 J. Paul Getty Wildlife Conservation Prize of the World Wildlife Fund.

Boonsong is the founder and Secretary-General of the Association for the Conservation of Wildlife of Thailand. He was named the Honorary Member of the International Union for Conservation of Nature and Natural Resources based in Switzerland last year and is the fourth person in the world and the first in the Far East to receive this prize.

THE NATIONAL ENVIRONMENTAL Protection Council of the Philippines has issued its first annual report on Philippine Environmental Quality. It covers the year 1977 and runs 251 pages (from the Council at the Philippine Heart Center for Asia Bldg., East Avenue, Diliman, Quezon City).

It covers how the government handled pollution of all sorts, natural resources, land use, population, energy, natural calamities, and has a section on environmental impact statements.

The Council also publishes a Primer on Environmental Protection, a Primer on Philippine Environmental Decrees and a newsletter, Environmental Facts and Features.

A COMPREHENSIVE PLAN costing \$2.5 million and including 28 projects has been formulated for wildlife conservation in Pakistan.

The plan is designed to ensure conservation of wildlife through integrated schemes including creation of special areas, scientific surveys and management of wildlife, reintroduction of endangered species, manpower training, establishment of national parks and strict enforcement of game laws.

The National Council for Conservation of Wildlife in Pakistan considered a number of proposals to generate funds to finance the master plan and decided to constitute a Wildlife Conservation Foundation on a voluntary basis for this purpose.

HONG KONG'S FIRST high-density solid-waste baling plant recently started a 12-month trial run. The \$3.4 million plant is part of the government's 10-year program for the efficient disposal of solid wastes.

High-density baling is a treatment process by which refuse is compacted in a hydraulic press to form bales of about 1.5 cubic meters in volume and 1.5 tons in weight. This makes the transportation of refuse more convenient. The plant will be capable of handling 600 tons of refuse daily.

Taiwan sets tough, new pollution control rules

TAIPEI—In Taiwan's rush to economic development, environmental considerations fell behind. But authorities are catching up with new, tough pollution control regulations.

At first the stress will be on combatting air pollution, coming from the smokestacks of rapidly spreading industry and the vehicles of an increasingly affluent population.

For industry, the rules went into force March 2nd after a sixmonth grace period to allow factories to adjust. They set severe limits on noxious emissions. Organic compounds, such as toluene and formaldehyde, and other chemical pollutants such as nitrogen dioxide, fluorine, hydrochloric acid, chlorine, ammonia, hydrogen sulphide, dimethyl sulfate and tri-methylene have been added to the list of substances banned.

Rules to limit auto exhaust, estimated to account for 90 percent of air pollution in Taipei, will not be enforced until July, after they have been worked out by the National Health Administration which supervises all anti-pollution programs in Taiwan.

Violators of the new rules for industry will face heavy penalties, with fines ranging from \$40 to \$400 a day. But the administration's environment bureau director, Chuang Chin-yuan, said that strict enforcement rather than stiff penalties will be the main deterrent. He promised extra staff will be used for industry-wide inspections.

Loud protests are expected from industry once the rules start to bite, particularly since few factories took action during the grace period. Company owners point out that Taiwan's economic expansion relies on moving into industries abandoned by industrial nations partly for environmental reasons.

Chuang admits that many smaller factories could be forced out of business by the cost of installing and using pollution control equipment. To overcome this problem, he said the government is planning to establish a fund to provide long-term low-interest loans for purchasing pollution control equipment.

MICHAEL W. BOYDELL

Bangladesh tackles waste management projects

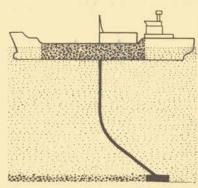
DACCA—The Environment Pollution Control Board of Bangladesh recently signed a joint communique with the United Nations Environment Program covering five projects. They are:

- Bio-gas generation using organic waste, to meet the energy needs of rural areas. A pilot biogas plant, using cow dung, will soon go into operation in Savar, 32 kilometers from Dacca. If it is successful, the government and UNEP will jointly finance a \$1.35 million national scheme.
- Sanitary landfill, to dispose of solid wastes in the capital, Dacca.
 - Extension of the sewer systems to cover all areas of Dacca.
 - Building public toilets throughout the capital.
 - And construction of 100 parks within Dacca.

To heighten environmental awareness, the Environment Pollution Control Board published a booklet of slogans and distributed it to industries, schools and offices. This promotion is also seen in newspapers and on radio and television. A leading government official said, "This program has had tremendous impact on the people."

SPECIAL TO WER

Law of the Sea: Russia and China vs. American mining



GENEVA—The six-week session of the 158-nation Law of the Sea Conference opened March 19 with clear evidence that the issue of deep-sea mining would continue to be the major point of discord.

Both China and the Soviet Union—in an unusual display of unity—warned at the opening session that any unilateral national legislation on deep-sea mining could undermine the work of the conference. And Ambassador Shirley Amerasinghe, Sri Lankan conference chairman, expressed the hope that seabed legislation planned by "certain industrialized countries" would not prejudice the cooperative atmosphere.

However, U.S. delegate Elliot Richardson replied that a U.S. draft bill on this issue was designed only as a temporary measure to permit American firms to press forward on their own until a

wider conference agreement was achieved.

But the Soviet Union, avoiding specific mention of the U.S., declared that such unilateral action would jeopardize conference efforts to reach a consensus. And China said it supported statements made by a representative of 119 developing countries that unilateral legislation would damage the achievements already accomplished and would undermine negotiations.

Although the conference that began in December 1973—it is the longest-running United Nations special conference—is seeking to regulate all human uses of the oceans, including fishing, navigation, mammal protection and seabed exploitation, the latter issue has touched off the most intense conflicts.

Richardson told the delegates that the bill, which has already passed the House of Representatives, was designed only to prevent the dispersal of technical ability while the conference worked out an international convention agreeable to all. He stated it would be in the interests of the entire world that an early start be made on exploitation of the nickel, cobalt, copper and manganese on the ocean floor and added, mining companies should not be expected to suspend their activities because the work of the Law of the Sea Conference was dragging. Richardson noted that the draft law foresaw no issuance of mining permits before July 1, 1982, and that in any case deep sea mining would not be commercially possible before 1985. WILLIAM G. MAHONEY

Water wise ...

THE UNITED NATIONS ENVIRONMENT PROGRAM (UNEP) will spend six months this year collecting, analyzing and appraising information on different methods of gathering rain and storm water in rural areas.

Ms. Letitia Obeng, chairman of UNEP's soil and water task force, explained at Nairobi headquarters that although much scattered information exists on water collection, no one has yet compared and evaluated the different methods—including age-old traditional systems used in Africa and Asia.

"In China, water is gathered and stored underground," Ms. Obeng said. "There are many methods of capturing rainwater—some simple, others quite sophisticated."

In the Sudan, native plants are used to treat stored water; in other areas, different local materials are adapted for storage and transportation.

Once the relevant data has been collected, a workshop of consultants and experts will be held to prepare guidelines for the better harvesting of rain and storm water.

A number of consultants are collecting the initial information in such countries as the USA, India, Mexico, China, Australia, USSR and in Africa. Later, it is planned to hold field demonstrations to record technologies and methods of rain and storm water collection.

IF THE CURRENT LEVELS OF POLLUTION in the Mediterranean are not lowered, the sea will renew its fish and plant life in the next 50 years, and the new species will not be commercial," French oceanographer Jacques Cousteau warned on a recent visit to Madrid to promote the Spanish translation of his encyclopaedia of the seas.

Cousteau said some 1,000 analyses of Mediterranean waters taken in all parts of the sea over the past 12 months have revealed that "this sea has lost 40 percent of its vital capacity thanks to pollution." He attributed this steady death to chemical pollution from factories and nuclear plants along the Mediterranean coastline, organic waste from towns and tourist centers and to "mechanical aggression"—reclamation of sea acreage for building purposes, construction of hundreds of jetties and quays, and modern methods of fishing using, for example, dynamite.

To save the Mediterranean, Cousteau urged an immediate ban on the dumping of degradable wastes and strict controls on

effluent.

In Latin America ...

PRESERVATION OF THE ENVIRONMENT was the theme chosen by the Roman Catholic Church in Brazil for its year-long 1979 Fraternal

Cardinal Ivo Lorscheiter, secretary of the Bishops Conference in this largest Catholic country in the world, said: "This might appear a strange attitude for the Church to take, but our role is to preserve the creation of God, who gave us a paradise which is now being destroyed by man." He said there was an imminent ecological crisis and that only an urgent change in international socio-economic behavior will save the world from utter chaos.

The campaign consists of sermons on ecology, meetings on the subject by church groups, publication of environmental information and educational ads in the press, radio and television.

MEXICO IS DEDICATING two more geothermal generating units this month at the Cerro Gordo plant near the U.S. border outside Mexicali. Using heat from natural underground sources, the 150,000 kilowatt plant saves about \$28 million a year in fuel oil.

The potential geothermal power there is 900,000 kilowatts, said Mexican President Jose Lopez Portillo who, as head of the Federal Electrical Commission, saw the potential of the area in 1973. A side effect of the Cerro Gordo installation is the production of 70,000 tons of potassium chloride a year with a value of more than \$6 million, which is used in fertilizers.

THE LARGEST BEER COMPANY in Colombia has created an annual \$25,000 prize for the best investigation or study favoring conservation of the environment. Selection of individuals and institutions will be made by a blue-ribbon committee headed by former Colombian President Misael Pastrana and Mostafa Tolba, executive director of the United Nations Environment Program.

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African miracle tree won't perform miracles in Brazil



MANAUS—First indications are that the spectacular miracle tree project in the Brazilian Amazon might be a failure.

Botanists and ecologists gathered at a recent seminar on Jari in Manaus, the capital of the state of Amazonas, gave eyewitness reports that the project might be in serious trouble. They concluded that the planting of the fast growing African tree was undertaken without the necessary feasibility studies and that there is still a general lack of knowledge about the agricultural capacity of the Amazon basin.

The Holland-sized Jari project in the eastern Amazon was started by American billionaire Daniel Ludwig, eight years ago. Ludwig's plan was to supply the cellulose for the world's paper industry by the mid 1980's. Almost 100,000 hectares of jungle have been cleared and planted with Gmelina arborea, an African softwood tree which grows at a spectacular rate of up to four meters a year. This tree matures in 8 to 10 years as compared to the 20 to 50 years for the conventionally used eucalyptus or the northern hemisphere pine.

That sounds like sound economics and great profits for Jari and Ludwig, however, after eight years, it appears the African tree is not adapting well in the Amazon.

Paulo Cavalcante, director of the Belem Botanical Garden was in Jari recently and reported that large areas of the Gmelina were being removed and replaced by Caribbean pine. "I believe that their upland agriculture has been a disaster," was Cavalcante's conclusion.

American ecologists who now work for the National Institute of Amazon Studies, INPA, Judy Rankin and Phillip Fernside, said at the seminar that the Gmelina was being attacked by fungus and caterpillars and that in poor soil areas it was not attaining the expected growth rate.

"Jari is still continuing indiscriminate tree felling and clearing. It is turning Amazonia into a desert and bringing unforeseeable consequences to the regional flora."

The Jari Seminar was organized as a result of the growing interest in the development of the Amazon and especially the recent heated controversy over the purported Brazilian government plan to give out huge lumbering concessions to multinational firms. Conservationists warn that such a move—especially if done without prior research would lead to a rapid destruction of the last large tropical rain forest in the world. This in turn could turn the area into a desert useless for agriculture or or anything else (see WER, October 9, 1978, p. 3).

GEORGE HAWRYLYSHYN

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In Namibia, South African scientists have methods to desalt and demineralize water for domestic and industrial uses. 7

Australia is going to mine uranium in a new national park. 8

Romania explores nuclear and oil shale energy resources

BUCHAREST—Romania, still the second largest European oil producer after the Soviet Untion—14.6 million tons in 1977—may be without its "black gold" in some ten years if new oil deposits are not found, government officials said. Economic planners have ordered development of "alternate forms of energy," including atomic power and oil shale, to save depleted domestic reserves of crude oil and natural gas.

The State Committee for Nuclear Energy of Romania and the Agency of Atomic Energy of Canada have signed several contracts for the building of nuclear power stations in this country.

The documents provide technical assistance for the construction of the first unit, including nuclear equipment, and the training of Romanian staff.

The deal was accompanied by the signing of a one-billion dollar loan agreement between the two countries in connection with the sale of four 600-megawatt nuclear reactors to Romania. The loan is the largest of its kind arranged through Canada's Export Development Co. for the sales of Canadian-produced goods and services. This is the first Canadian nuclear reactor sold to a Communist country, and the agreement follows several years of negotiations between Canada and Romania.

Romania intends to build up to 16 nuclear power static ns over 20 years to replace existing oil and coal plants. Plant ers say Romania will meet 20 percent of its energy needs with nuclear plant-produced energy by 1990.

Work at the first nuclear electric station, which will use natural uranium, could start this year.

"The signing of the documents is an important step in the development and expansion of nuclear cooperation between Canada and Romania...for the peaceful use of atomic energy," the Romanian official press agency said.

Romania is also cooperating with the Soviet Union for the joint construction of a 440-megawatt nuclear power plant. The design and construction of the plant is to be done by Romanian specialized enterprises. The plant will use enriched uranium to produce about 2.6 billion KWH of electricity a year, according to press accounts.

Meanwhile, the construction of a 990-megawatt electric plant to be fueled by oil shale started last year. The plant, described as a "world premiere," will burn some 12 million tons of shale annually, to be extracted in south-western Romania at Anina, where the plant will be located.

SPECIAL TO WER

Energy Sources...

THE EUROPEAN COMMUNITY (EC) has approved aid totalling 5 million European Units of Account (about \$6.5 million) for uranium exploration projects in the nine countries of the EC. The aid, given to private firms selected after tender offers to the EC, is intended for programs undertaken between 1979 and 1981.

This is the fourth such program since 1976 when 1 million EUA in aid resulted in seven uranium prospecting projects, including the one in Kvanefjeld, Greenland, where substantial uranium deposits were discovered. The second and third exploration projects each got 5 million EUA in aid.

BRITAIN IS INVESTING more money in the production of oil from coal.

In an agreement signed last month with the National Coal Board, Mr. Alex Eadie, Parliamentary Under Secretary of State for Energy, promised a government contribution of up to £800,000 (\$1.6 million) towards the estimated £1.2 million (\$2.4 million) cost of preparatory work on two pilot plants for converting coal.

At the next phase, the government would be prepared to contribute up to £20 million (\$40 million) of the estimated £30 million (\$60 million) construction cost of the two 25 ton-aday plants.

The government promised investment support for projects converting coal into gasoline, substitute natural gas and raw materials for the chemical industry following the recommendations of one of its working party reports* on future coal technology, published in May, 1978.

*Coal Technology—future Developments in Conversion, Utilisation and Unconventional Mining in the United Kingdom". Available free of charge from The Library, Department of Energy, Thames House South, Millbank, London SW1P 4QJ.

THE INDIAN INSTITUTE OF TECHNOLOGY has announced that it has developed the most efficient photovoltaic solar cell to date. Dr. K. L. Chopra, the physicist who developed the cadmium sulphide cell, states that it is many times cheaper to produce than silicon cells and is capable of converting sunlight to electricity with 11 percent efficiency, the highest rate yet achieved. Dr. Chopra states that the CDS cells should be available for commercial production in about five years.

Energy, fertilizer, and feed

from Romanian biogas plant

BUCHAREST—Romanian researchers are changing pig farming wastes to fuel. A pilot station for obtaining biogas—a fuel gas that contains 80% methane and the remainder carbon oxide and dioxide—from pig feces was recently set up at Peris, near Bucharest, the Romanian Communist party organ, Scinteia, reported this month.

The complex, placed near a station for filtering waste waters from the Peris pig breeding farm, can process the waste from 5,000 pigs, and produce some 500 cubic meters of biogas a day, corresponding to a power equivalent of 3.25 million kilocalories a day. It reportedly saves 75-80 tons of fuel oil a year. To speed the process, methanogenic bacteria are introduced into the wastes. Fermentation time is shortened from 35 days to one week.

The discovery will soon be applied on a national scale and according to specialists, "tens of thousands" of tons of oil products could be saved by using biogas resulting from the major pig breeding farms in Romania.

Eng. Gh. Stoica, scientific director of the Research Institute for Food Industry and Chemistry said the sludge obtained after fermentation can be used as a "best quality" fertilizer, is rich in proteins and vitamins of the B 12 group and has biostimulating characteristics. The mud, which is stabilized and has no smell, can be mixed with fodder in various amounts and used with good results in pig raising.

SPECIAL TO WER

East-bloc Comecon group expanding nuclear plans

EAST BERLIN—Member states of Comecon, the Communist economic grouping that in a limited manner parallels the Common Market, are actively expanding their nuclear power station capacities, according to a Soviet nuclear energy official.

Prof. Nikolai Sinev, a member of the Soviet State Committee for Nuclear Energy, wrote in the latest issue of the East German Army weekly "Volksarmee" that Comecon nuclear power stations now have a total capacity of 10,340 megawatts.

But, Sinev explained, this will be increased and the planned expansion of nuclear power capacity will permit Comecon states to reduce imports of expensive fuels.

He said that the Soviet Union presently has 12 nuclear power stations that produce a total of 8,000 megawatts. However, the

present Soviet five-year plan foresees construction that will provide an additional 13,800 megawatt capacity, he wrote.

The article said that the first stage power plant in Kosludui, Bulgaria, produced 800 megawatts and this plant is now being expanded.

In Czechoslovakia where four blocks of a complex are under construction, he said, this center will eventually produce 1,760 megawatts.

East Germany, with its "Nord" plant, has three reactors that since 1978 have been producing 1,320 megawatts, according to Sinev.

The Pecs reactor in Hungary is scheduled to reach 1,760-megawatt output in 1984, Sinev wrote.

The article stated that nuclear power stations were also under construction in Poland, Romania and Cuba. SPECIAL TO WER

Swiss approve nuclear plans in close referendum

GENEVA—In a national referendum voters narrowly defeated a proposal that could have effectively banned new nuclear power stations in Switzerland. It was a slim victory for the government and industry. After months of public debate nearly two million people voted, and the margin against the proposal was only about 45,000.

The government had lobbied actively in favor of its nuclear energy program after the Austrian example. There, in a similar referendum last November, voters decided very narrowly against putting Austria's first nuclear power station at Zwentendorf into operation.

The Swiss proposal was aimed at curbing the government's power to decide whether to build nuclear power stations and, if so, where they should be located.

The proposal arose from a private citizen's initiative for a Constitutional amendment sponsored by Swiss environmentalists and backed by 123,000 signatures. Voters were asked to choose between three possible courses: first, decision making powers in nuclear energy policy should remain as they are; second, the powers should be shifted from the government (Federal Council—the executive arm) to the Federal Parliament; or third, veto powers over the operation of a power station should be given to local voters near the station site. The Swiss chose the first course.

The government said it needs the nuclear energy program in order to meet energy needs until the end of the century. Some 20 percent of Switzerland's electricity is nuclear generated and, to lessen its dependence on oil, the government says it must build even more: three are in operation, two under construction and five nuclear plants are planned.

It would be premature to see in the Swiss vote any waning of nuclear opposition in Western Europe—where the debate has tumbled governments and damaged political careers (see WER, Jan. 1). But energy needs create political expediency. The French cabinet earlier this month decided to speed construction of

In Europe ...

SWITZERLAND'S EFFORTS to curb noise pollution from road traffic have gone far beyond recommendations and standards established by such international institutions as the Economic Commission for Europe or the European Community.

This country's largest automobile club—the Touring Club Suisse—found that Switzerland was also more demanding than other leading countries, such as the United States and Japan. Furthermore, it said, still lower ceilings on permissable noise will be imposed in the future.

TWO FRENCH CONGLOMERATES have been awarded contracts by the government to study the feasibility of constructing a 100,000-kilowatt power plant supplied with energy generated by thermal gradients in ocean waters. One conglomerate, Compagnie Generale d'Electricite (CGE), will study the possibility of building the power station at sea. The other, Creusot-Loire, will submit a study theorizing its construction on land. Both studies will be ready, according to the French government agency awarding the contracts, le Centre National pour l'Exploitation des Oceans (CNEXO), in early 1980, and construction could begin shortly thereafter, with completion scheduled for 1983-84. The studies are the first of their kind supported by the French government.

SWEDISH ENVIRONMENTAL ACTION GROUPS have joined together to form a new political party—the Environment Party. It will not campaign on a national basis, however. Its candidates will run for office only in the Stockholm County Council elections next September. The program drawn up so far includes opposition to nuclear power plants, a ban on the sale and use of goods which could lead to pollution or damage the environment, and an inner city free of traffic.

A WORLD HEALTH ORGANIZATION group, in collaboration with the Dutch government, will meet at Bilthoven, The Netherlands, April 3-6 to examine the chronic and sublethal effects of air pollution in private dwellings and enclosed public areas. This includes schools, theaters, restaurants, stores, halls and waiting rooms. The study will not include hospitals and other health care buildings which are already covered by standards.

Forestry ...

THE PHILIPPINE MINISTRY of Natural Resources recently announced that 242,636 hectares of barren areas in the country have been reforested since 1966.

From 1966 to 1971, the average annual rate of reforestation was 7,252 hectares. Starting in 1972, when martial law was proclaimed, to 1978, the government reforested 199,122 hectares, an average of 28,446 hectares annually. In 1978 alone, 78,425 hectares were reforested by the government and the private sector. This is the highest record so far achieved in reforestation for one year.

BECAUSE MORE THAN FOUR MILLION hectares of forest land have been lost in India over the last 25 years, the government is planning to revise its forest policy by introducing environmental aspects before allowing river valley clearing projects.

The National Commission of Agriculture has suggested that if deforestation is essential for some purpose, the state legislatures should give their approval.

A recent survey has shown that of the total area lost, 50 percent went for agricultural purposes. River valley projects and rehabilitation of displaced persons took a major chunk of forest land. Industries took away over 120,000 hectares and another 57,000 hectares for road construction.

The total forested area is now estimated at 75 million hectares, about 23 percent of the geographical areas.

CHINA HAS ANNOUNCED that it will take urgent measures to revitalize its forestry industry. At present, forested land accounts for only 12.7 percent of the country's total land surface giving an average of 0.32 acre (0.13 hectare) of trees per capita. Only 69.16 million acres (29 million hectares) of saplings have been planted since 1949 and 197.6 million acres (80 million hectares) of wasteland and barren hills suitable for growing trees have not yet been afforested. Some 1.98 million acres (800,000 hectares) of cutover forest in the major forest regions have also not been reforested.

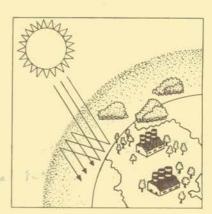
THE WORLDWATCH INSTITUTE recently published another in its series of environmental papers which may be of interest to WER readers. It is titled "Planting for the Future: Forestry for Human Needs," by Erik Eckholm, and has a most worthwhile section on some successful community forestry programs in China, India and, in particular, South Korea. Copies at \$2 each are available from the institute at 1776 Massachusetts Ave., N.W., Washington, D.C. 20036, U.S.A.

nuclear power plants because of dwindling world oil and natural gas supplies. Comecon nations are also actively expanding nuclear power capacities.

The Swiss government has no illusions that the issue is now settled. It faces another referendum test of its nuclear energy policy in May, when a revision of Switzerland's atomic energy legislation must be put to the voters for their approval.

WILLIAM G. MAHONEY

World Climate Conference sees dangerous warming trend



GENEVA—Some 300 scientists from 50 countries warned here at the conclusion of the first-ever World Climate Conference (24 Feb.) that mankind's indiscriminate use of fossil fuel, felling of timber and use of artificial fertilizers threatened serious damage to the global environment.

The statement concluding the two-week meeting added that only joint action by all states could halt and reverse the trend. The conference was organized by a United Nations agency, the World Meteorological Organization (WMO).

The experts agreed that the worst problem was the increase of carbon dioxide in the atmosphere. Combustion of fossil fuels has steadily increased the amount of carbon dioxide, they said. The experts explained that the gas acts very much like the glass in a greenhouse, permitting the sunlight to penetrate and warm the earth and preventing excess heat from radiating back into space. Any accumulation of carbon dioxide will eventually warm the climate—particularly at the high alfitudes. *Qualitation*

Deforestation was discussed as an international concern because any such large scale activity would affect climate elsewhere. Trees, as they grow, remove carbon dioxide from the atmosphere and store it in their wood and leaves. Much of that carbon dioxide is returned to the air when the trees are cut down and burned or decay. Scientists attributed a large part of the recent increase of carbon dioxide to the destruction of woodland.

The scientists also noted that increasing use of nitrogen-based fertilizers could add enough oxides of nitrogen to the atmosphere to cause additional warming.

Their statement was explicit: "We can say with some confidence that the burning of fossil fuels, deforestation and changes of land use have increased the amount of carbon dioxide in the atmosphere by about 15 percent during the last century."

WILLIAM G. MAHONEY

Swedish paper companies are | Environmental pressed to speed cleanup

STOCKHOLM—Swedish pulp and paper companies must invest an estimated 1.1 billion Swedish crowns (\$253,450,000) during the next five years on measures to protect the environment, according to an industry association report.

Initially during this period, the industry would like to move along at a slower pace until completion by 1981 of research into the effect of pollution discharges from the mills and at the same time test new methods of recycling and cleansing waste before introduction on a large scale.

"We want to avoid big investments in new untried techniques," Bo Wergens, managing director of the Pulp and Paper Mill Association, told the press when presenting the industry's invest-

ment needs.

Sweden's Environment Protection Board, however, is pressing for faster action and a bigger investment. It wants the industry to spend 1.4 billion (\$322,580,000). By applying the best techniques available at present, the agency said in its long-term study, paper and pulp plants would be able to meet today's environmental protection demands by 1985. SPECIAL TO WER

Swedes asked to mappollutants in Arabian Gulf by UNEP

STOCKHOLM-The Arabian (Persian) Gulf nations are concerned about the gulf's environmental health, and so a Swedish organization has been asked to map pollutants in the world's main oil tanker route—and forecast its future development.

Sweden's semi-official Institute for Research into the Care of Water and the Atmosphere (IVL) will begin in June-if political conditions permit. The Swedish researchers will have approximately six million Swedish Crowns (\$1.4 million) at their disposal and are to complete the project within 21 months. The program is under the direction of the United Nations Environment Program

In discussing the assignment with the Swedish press, IVL project leader Professor Arne Jerneloev told newsmen that the Persian Gulf already has been affected by pollution, especially oil, and the area's fast-growing petro-chemical industries. "If no regard is taken for the environment, the situation rapidly will become worse," he said.

IVL has applied its knowledge and technique in recent years in connection with several major oil catastrophes abroad. The company cooperates closely with sister institutes in Denmark and Norway. Under a contractual agreement, they already are working together on a project to safeguard drinking water at Casablanca in Morocco, and they will soon tackle the problems of quicksilver in Thailand and water pollution in Cartagena, Colombia. SPECIAL TO WER

Legislation ...

SWEDEN'S PRODUCTS CONTROL BOARD has banned two chemicals used to fight weeds on grounds that there is a risk they could cause cancer and have damaging effects on the fetus.

Called TOK E 25 and TOK W 50, both contain a compound named nitrofen. The chemicals were given clearance in 1965 because tests at that time failed to show any serious side-effects. However, the Board said new information now has come to its attention and consequently it decided to withdraw the license to sell or use the chemicals. In 1977, 26,000 liters were applied to 17,200 acres. The Board said substitutes were available.

A CHILEAN FOREIGN MINISTRY spokesman said that Chile will soon ratify its membership in the International Whaling Commission.

Chile's catch for 1977 (the last year for which figures are available) was 76 whales. In 1976 the catch was 87 and in 1975 it was 106, according to

the Foreign Ministry spokesman.

The Chilean government hopes that the Commission, which now has a zero quota for Peru and Chile, will examine scientific data to be presented by Chile and reconsider its quota. Only one firm in Chile is currently licensed to hunt whales in Chilean territorial waters, the Macaya Brothers of Talcahuano.

Peru, which kills about 1,000 whales a year, has not yet deposited its instruments of ratification with the IWC, said the Chilean

source.

THREE FACTORIES IN KWEILIN, a famous scenic spot in China, have been ordered to stop operations and another to close down because of industrial pollution, the New China News Agency said.

Kweilin is renowned for its dramatic landscape, clear rivers and magnificent caves. However, in the past few years, industrial wastes have badly polluted the river, some of the rocks have whitened and many trees withered. Most of the fishermen in the area have turned to

other occupations.

The news agency reported that it has been decided that all plants in the area should control pollution within a specified time. Those factories that demonstrate no progress must be removed to other places or be used for other purposes. No new plant or expansion of any kind will be allowed in the future without permission.

Environmental Management...

IN KENYA lack of environmental management has led to pollution of rivers, disappearance of forests, encroachment of deserts, shortage of cultivable land, poverty, hunger, unemployment and a severe urban housing problem.

This was said by Michael Njenga, director of Kenya's National Environmental Secretariat—a government-backed organization—at a national symposium on environmental education in Nairobi.

Delegates, including educationists, social workers and environmentalists, agreed that greater emphasis was needed on environmental matters in Kenya's education system at all levels—including in the mass media.

PHILIPPINE PRESIDENT Ferdinand Marcos has set up a committee to develop and implement immediately a plan for solid waste management and resource recovery in the city of Manila.

Marcos explained that environmental quality and public health have become matters of vital concern to the government, and the accumulation of solid wastes caused by the increasing population and growth in resource consumption is further aggravating the ecological problems in Manila and its environs. The master plan for solid waste management is aimed at the collection and disposal of garbage, to eliminate their nuisance and danger to public health, and maximize recovery from solid waste.

THE MALAYSIAN GOVERNMENT has developed a three-point strategy—short-term, midterm, and long-term measures—against pollution in the country over the next 10 years, Science, Technology and Environment Minister Tan Sri Ong Kee Hui said.

Tan Sri Ong said the three measures will cover the control of water and air pollution, the provision of guidelines for planning and development agencies and the protection of the qualify of life of people affected by development projects in the country. Also, a nationwide water and air quality management program will be launched to complement the implementation of these measures.

The Ministry's Environment Division has set up an inter-departmental committee to make recommendations for improving the present method of waste disposal. A similar committee will be set up shortly to advise the division on formulating regulations for the control of marine and noise pollution, Tan Sri Ong said.

UNEP Environment Fund running \$30.5 million short of target

NAIROBI—United Nations Environment Program executive director Mostafa K. Tolba warns, in a report to be presented to the seventh UNEP General Council in Nairobi on April 18, that estimated resources for the UNEP Fund for the 1978-81 period are \$30.5 million short of the \$150 million target set by the Governing Council in 1977. "The modest amount of resources required surely cannot be considered as posing any insuperable obstacle," he adds. But some major donors have recently warned that the \$150 million target is unlikely to be achieved.

The Environment Fund depends on the voluntary contributions of member-states. But less than half the U.N. member-states are contributing and 14 developing countries (Botswana, China, Cuba, Egypt, India, Ivory Coast, Jamaica, Jordan, Liberia, Morocco, Oman, Qatar, Saudi Arabia and Swaziland) which have contributed in the past have announced no pledges for 1978 and onwards. Venezuela reduced its 1977 contribution by \$20,000.

However, ten developing countries pledged contributions in 1978 for the first time; 17 countries (10 developed and 7 developing) increased their pledges; and 48 countries maintained their 1978 pledges at 1977 levels.

Problems of the shortfall are increased by the need to spend considerable sums which are contributed in non-convertible currencies (mainly by the Eastern Bloc states).

Dr. Tolba warns that the Fund is approaching a turning point in 1979-80, and the Governing Council must give concrete guidance on future policy. He says 1978 was the first year in which the availability of resources became a serious constraint on the development of the Fund program.

CHARLES HARRISON

Egypt's Mohamed El Kassas discusses desertification

CAIRO—Scientists and planners the world over are at last mobilizing to combat the ominous growth of the desert, and this is due in no small measure to the efforts of a softspoken, unassuming Egyptian botany professor.

He is 58-year-old Mohamed El Kassas who, more than 30 years ago, started to study plant life in the Egyptian and Sudanese deserts. Since then, in classrooms, international scientific societies, and learned journals, he has been warning man of the dangers that will befall him if he continues to abuse natural barriers to desertification. Last year he won the International Pahlavi Environment Prize for his outstanding contribution.

"It's often thought that deserts creep or spread across cultivated fields and, like invading armies, sand dunes conquer fertile lands. But it doesn't happen that way at all," he explains. "What does occur is that through over-grazing and over-cutting of trees and brush, as well as through neglect of soil and water conservation,

the eco-system of the fertile areas is destroyed from within and then they turn into desert."

He is the current president of the International Union for Conservation of Nature and Natural Resources (IUCN), a 30-year-old organization with 430 members representing 100 countries. Dr. Kassas, the first scientist from the developing world to serve as president, wants to use his position to focus world attention on the need for conservation in arid lands.

He helped plan the 1977 UN-sponsored conference in Nairobi on desertification but has not been satisfied with subsequent international response. He estimates it will take at least \$1.5 billion a year for the next 20 years to reclaim land now being lost to the desert and to educate everyone—from nomad to policy-maker. To raise the money, he has called for an international system of taxation.

Although he has been deeply involved in United Nations projects over the years, Dr. Kassas believes "the most important thing is to build up each country's indigenous capacities. This is more important than outside help in the form of food or money. Of course, research is useful, but the basic technologies are already known. It's more important to apply existing knowledge than to enlist more experts."

NATHANIEL HARRISON

South African scientists desalt Namibia's water



JOHANNESBURG—Mineral-rich Namibia is critically short of one major resource, water.

South Africa's National Institute for Water Research (NIWR), based in Pretoria, is now coming to grips with the problem, and its innovations may have relevance to other arid areas of the world.

The capital, Windhoek, since the early 1960s has been the first municipality in the world to drink its own purified sewage. Ten percent of its water is purified effluent.

But the NIWR's most important area of research is mapping the territory's groundwater supplies—20 percent of the area and 20,900 sources have now been mapped, tested and computerized. And much of it is too highly mineralized even for animals.

Desalination is therefore necessary, and the NIWR has researched solar desalination. With South Africa's Department of Water Affairs it has published a do-it-yourself manual on how to make a solar still that will produce drinking water in low rainfall areas where groundwater is highly mineralized. (Large areas of

Water wise ...

THE CITY OF CARACAS has been suffering from water shortages for several months. Some Venezuelans charge it is not just drought, the water system is simply inadequate to serve peoples' needs. As a result, some local and national politicians fell out of favor in the recent elections.

Last week Jose Curiel, chief of a transition team working with the Environment Ministry's engineers, stated that contrary to previous announcements, water shortages would continue. He said Caracas' water reserves were at an alarming low.

Minister Arnoldo Jose Gabaldon confirmed the news a few days later, saying the rationing of water in parts of Caracas will continue until March. It also was announced that due to the low level of Caracas' water reserves, the water supply would be cut entirely in some parts of the city during weekends.

The rainy season usually starts at the end of June and lasts till September.

THE PHILIPPINE GOVERNMENT will manufacture solar cells to power portable irrigation pumps in rural areas this year. Technical requirements of the \$203,000 project are being undertaken by the Philippine Atomic Energy Commission.

The government also plans to utilize agriculture wastes to produce gas for running irrigation pumps.

DROUGHT has cut the South African maize crop of 1978/9 to less than 8 million tons. Last year's crop was nearly 10 million tons.

THE WESTERN AUSTRALIAN government has refused to let the United States carry out a cloud-seeding project on cyclones.

U.S. scientists overseeing the National Oceanic and Atmospheric Administration's project "Stormfury" had planned to seed cyclone clouds in an attempt to release latent heat, which would widen the eye of the cyclone and thus dissipate winds. Similar experiments on American hurricanes have been carried out in the 18-year-old project.

The Minister for Regional Administration, Des O'Neil, informed the federal ministry of science that Western Australia benefitted more from cyclonic rainfall than it suffered from wind damage. There were fears that this experimental control of cyclones, and especially their wind force, would reduce rainfall or change the cyclones' courses, due to the seeding. Project "Stormfury" had been expected to start here later this year.

Down under . . .

IT'S BEEN A BOOM YEAR for Queensland's wheat crop, and some of Australia's exotic wildlife is eating up the profits.

A record 1.98 million tons of wheat—three times last year's crop—has been harvested. But wild pigs, emus, rats, mice, cockatoos and weevils are devouring tons of the grain awaiting shipment in temporary silos on the farms.

The make-shift silos have been damaged by the foraging creatures while the crop awaits removal by the Australian Wheat Board. In some areas, the pests have already been feasting for three months. And while electric fences can keep out the pigs and wide-eyed emus, weevils can't be fumigated out of the temporary silos.

The Australian Wheat Board recently closed a \$900 million sale to China of 8.25 million tons of wheat for the next three years.

SOUTH AUSTRALIA will not back down on the moratorium on uranium mining imposed 18 months ago.

State Premier Don Dunstan returned to Adelaide from a two-week fact-finding mission to Europe and announced that his Labor government could see no major developments which suggested nuclear safeguards—including its particular concern, the disposal of nuclear waste—were any safer than the situation under which the mining of uranium was banned in South Australia.

A week after his announcement, Mr. Dunstan resigned his post for reasons of ill-health. A Labor party convention several days later endorsed his stand and thus avoided taking the issue to a public referendum.

One large deposit in South Australia is the Beverly, which has 15,780 tons of low-grade (5.3 percent) uranium oxide. Only one uranium mine, the Mary Kathleen, is now producing uranium for export although construction of facilities is underway at the Northern Territory Ranger (100,350 tons, 7 percent uranium oxide) deposit.

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Namibia receive as little as 50 millimeters, 2 inches, of rain a year.)

Since distillation is of little practical use for industry, the NIWR investigated reverse osmosis. "The process has proved itself and is highly recommended," says the NIWR. It is now extending its research to desalting sea water at the coastal desert town of Swakopmund where there is a pilot plant.

Because of health dangers, especially to infants, high nitrate concentrations in groundwater at various places in the territory are a serious problem. The Institute recently developed a practical ion-exchange method to remove nitrate ions from water. The process is being evaluated.

Biological denitrification is a practical process for farmers, as higher nitrate levels are permissable for stock watering than for human consumption. In this process bacteria reduce the nitrate content by converting most of it to nitrogen gas which escapes to the atmosphere.

The process is aerobic and uses molasses as a carbon source. The process has proved successful in the laboratory and design criteria are being evaluated. The NIWR is producing a simple apparatus that can be made by farmers.

JAMES CLARKE

Australia to mine uranium in new national park

PERTH—A uranium deposit which lies wholly within the recently declared Kakadu National Park in Australia's Northern Territory is expected to go into production by 1981.

Noranda Australia Ltd. (the parent firm is Canadian) said in its environmental impact study that it will mine the Koongarra deposit, one of the smallest in Australia, for 12 years.

The company plans to dump waste acid tailings in a pond about 3 kilometers from the mine site, then cover it with water to a depth of 1.5 meters. At the end of the mine's life, the tailings will be covered by two meters of earth to cut radon gas emission. This plan is a concession to the government's recently toughened environmental demands. Original expectations were that tailings would be dumped in the hills behind the minesite—but the hills contain a major Aboriginal art site and tourist point. Other environmental concessions include the retention of contaminated ground water and rehabilitation of the area in a five-year program costing \$10 million.

The question of the escape of radon gas has also been raised in the case of Western Mining Corporation's Yeelirrie mine in Western Australia. The company is resisting vigorous opposition by environmentalists to its plans to store radioactive tailings in a surface dam, rather than putting the tailings in the mine itself after high-grade ore is extracted. The release of radon gas would be reduced 25 percent by doing the latter. But the corporation wants to mine the lower-grade ore at the bottom of the mine later. The tailings, in the corporation's preferred scheme, will be damped down in the dam with a 6.6 meter-thick wall, then covered with a 0.6 meter layer of soil and gravel.

JANE NACZYNSKI-PHILLIPS

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America's AID program works at environmental responsibility

WASHINGTON—"The best thing that could have happened to us was the suit the four environmental groups brought against us. You can see definite changes in the way AID is operating now." And, said Albert C. Printz Jr., AID's environmental coordinator, "I think we'll have a different kind of program a year from now."

The suit, brought against the U.S. Agency for International Development in 1975 by the Environmental Defense Fund, Sierra Club, Natural Resources Defense Council and National Audubon Society, compelled AID to make environmental assessments of its projects in developing countries.

Previously AID had prescribed for the recipient country without necessarily asking what was wrong: "Take this, it's good for you." Over the past year, to prepare the fiscal 1980 budget, 67 USAID missions, regional offices and embassy sections have actually asked the developing countries to identify their problems and then worked with them to come up with programs for AID. In each of these programs, environmental considerations must be taken into account.

Each mission now has to submit a Country Development Strategy Statement. Printz said the missions identified 68 environmental programs; Printz and company found more than 150. "We are trying to get information out to the missions so they are more in tune with the environmental problems of the countries," Printz said. "I expect once the missions get the hang of it, we will have a much sounder program, and each country will pretty much get a tailor-made program."

In AID's total \$1.7 billion budget now before Congress, Printz thinks at least \$240 million of it could be defined as environmental. He quickly adds that AID's definition is broader in scope than for example, the World Bank's. The World Bank estimates that no more than 3 percent of its \$8 billion in project loans this year is environment-related; about 7 percent of AID's total budget is now considered "environmental."

One AID environment project is a direct result of the U.S.-Panama canal treaty: AID will provide \$10 million of a total of \$16 million to do a complete Panama Canal watershed management study and then implement the two nations' joint findings. Egypt is getting huge chunks of money from AID's other pocket, the Security Support Account, and \$113.5 million of that is environment-related. A very big project is a sewerage system for Alexandria. Printz says his office is continuing its emphasis on renewable energy. In 1978, renewable energy projects got over \$17.6 million; in 1979, it was \$18.3 million and for fiscal 1980, it will

Environmental Management . . .

UNITED NATIONS INSTITUTIONS should ensure that environmental questions are considered in all their operations, says a report to be submitted to the annual Governing Council of the United Nations Environment Program in Nairobi this April.

The report, prepared on the basis of a study commissioned by the Environment Coordination Board, says there is always a risk of environmental factors being overlooked in the preparation of UN development schemes. It recommends a separate section on environmental aspects in all UN Development Program

(UNDP) project reports.

It praises the World Bank, which it says appears to be the only organization in which a systematic centralized effort is made to minimize possible adverse environmental impacts of operational field projects. The report suggests that the World Bank might take the initiative for preparing a short non-technical publication for senior government officials about the need to take environmental factors into account in development projects.

THE 20 INDUSTRIALIZED NATIONS which make up the International Energy Agency (IEA) announced earlier this month that they would reduce their demand for oil by about two million barrels a day, or about 5 percent of their combined consumption. This energy-conservation measure was not prompted by ecological logic but by the increasing strain on their economies brought about by Iranian oil disappearing from the world market and the resultant increases in price asked by many thirdworld oil producers.

The IEA was created as a response to the 1973-74 oil embargo and is an insurance policy of sorts—an oil-sharing agreement when a member has a shortfall in oil greater than 7 percent.

THE UNITED STATES and the Soviet Union signed an agreement in Moscow to continue joint oceanographic projects for another three years.

Participants said the pact permits a study of some phenomena that would be impossible for either country to research by itself. In some projects, the U.S. provides the advanced technical equipment, including computers, while the Soviet Union provides the research vessels. Included among the major continuing projects is the study of ocean currents.

The original agreement was signed in 1973.

be \$45.5 million with Asian nations getting the lion's share.

Printz says that when Congress finally approves the entire fiscal 1980 budget, probably in mid-April, "some of our projects may be shelved and some combined, but I don't anticipate any difficulties in almost all of these going ahead."

LIBBY BASSETT

EPA's overseas program is small but beneficial

WASHINGTON—It is a small program by any measure. Even within the Environmental Protection Agency, Dr. Donald T. Oakley's foreign technical assistance program is known to only a few—a tiny niche in the bureaucracy. Nevertheless, Oakley's program, part of the EPA Office of International Activities and little more than a year old, is starting to make its presence felt where it counts most: in the developing countries.

"Our greatest resource is expertise," says Alice B. Popkin, director of the Office of International Activities. "We feel a responsibility to help." And since the EPA is essentially a domestic agency, Oakley explains, the help is not in the traditional form of huge dollops of money but in a handful of experts culled from various EPA departments whose expenses are reimbursed by the host nation.

One reason Oakley's program has such low visibility is that it doesn't cost the U.S. very much. Perhaps more to the point, he runs a one-man show. With authority to tap EPA experts from around the country for short-term technical assistance missions, Oakley needs no staff. That is highly unusual in status conscious Washington.

Oakley finds that what the agency can offer is not always so easy to dole out, since department heads are reluctant to part with key personnel even for short periods. "Basically," Oakley says, his job is like "horse trading to find the right expertise." And only about half of the technical assistance requests, most of which are filtered through the State Department and the various embassies, can be met.

Recently Oakley sent experts to Iran, to Nigeria and to Brazil. "The returns aren't in yet," Oakley says of the fledgling program, but as the number of foreign environmental officials who request to tour U.S. facilities goes up, so do the requests for U.S. expertise.

A few weeks ago Oakley returned from what he says was a "sounding mission" to Saudi Arabia "to nail down the kind of experts they need." The Saudis have made an unprecedented request for four full-time experts to stay at least two years. Oakley came away impressed that "in the face of all the industrial development, the Saudis have included an environmental consciousness" in their planning. The U.S. mission is designed to help the Saudis develop environmental legislation and two and five-year development plans.

PETER PHILIPPS

New pollutants, old polluters hamper Rhine River cleanup

DUSSELDORF—Municipal officials from 29 cities along the Rhine River ended a two-day meeting here this month by calling on the parliaments of the five countries sharing "the world's longest sewer" to enact legislation requiring industry to make known the exact composition of the wastes they dump into the river.

"Until now," Jul Lieffering of the Amsterdam delegation told WER, "the problem has been one of looking for a black cat in a black room. Some 1500 different noxious substances are known to be dumped into the Rhine by industry, with some 600 new substances showing up every month. But which firms are dumping what substances? No legislation currently exists to force companies to declare what they are putting into the river." Without such legislation, he said, it is impossible to pin the blame and to punish the offenders.

The municipal officials, from cities with populations of more than 100,000, were invited to the meeting by the city councils of Amsterdam, Rotterdam, The Hague and Dusseldorf. They agreed to submit a 10-point resolution approved at the meeting to the environment ministers of Luxembourg, West Germany, Switzerland, France and The Netherlands, who are scheduled to meet next month.

"We all consider this symposium a major step forward," Mr. Lieffering said. "Never before has the problem been approached from a political point of view. Sure, scientists have met to discuss the problem of Rhine pollution. But this meeting will give a new impetus to bringing about true political cooperation, which has been long in coming."

Some analysts at the meeting, however, were less optimistic, noting that only 29 of the 50 cities invited had actually sent representatives. France was poorly represented—the mayor of Strasbourg, for example, refused to come, saying he was incompetent to discuss the problem. Its small representation was significant in light of the fact that France remains the only country yet to ratify the so-called Bonn Agreement signed by the five Rhine nations in 1976. The Agreement sets forth anti-pollution steps to be taken, notably by France, whose Alsace potash mines account for one-third of the river's total pollution by salt. It stipulated that France should begin by reducing its salt dumping by one-sixth.

The 10-point resolution adopted by the municipal officials called on the environment ministers to draw up and initiate a common plan for cleaning up the river, in accordance with a European Community (EC) directive agreed on in 1975. It also urged the ministers to ask their staffs to compile "a quantitative and qualitative inventory" of all waste products presently found in the river and to adopt "profound measures for the protection of the water by purifying domestic and industrial waste." It finally called on the five nations "to pool their financial resources" in order to complete the cleaning task.

GARY YERKEY

In Europe ...

SWEDISH FOREIGN MINISTER Hans Blix complained in Switzerland about air pollution from four European countries that he claimed had affected 10,000 Swedish lakes and many forests. He spoke at a press conference in Berne. He charged the damage was caused by air pollution from Britain, Poland, East and West Germany.

Sweden has been actively attempting to persuade the 30 European members of the Economic Commission for Europe (ECE) to agree to control air pollution that crosses national borders.

A PARIS-BASED ENVIRONMENT GROUP, Espaces pour Demain, has announced plans for a European Sun Day June 23, 1979, patterned after a similar American experiment last year. It will be the first time major environment groups throughout the nine member nations of the European Community (EC) have joined together on such a project. Previously, their cooperative efforts have focused on staging anti-nuclear demonstrations and on lobbying at EC headquarters in Brussels.

European Sun Day will be coordinated by the Brussels-based European Environment Bureau, the umbrella lobbying organization at EC headquarters. It has received the support of the president of the EC Commission, Roy Jenkins.

POLLUTING is to become a criminal offense in Spain, punishable under a new penal code expected to be approved by the end of 1979.

The Director General of Spanish Jails, Carlos Garcia Valdes, said a new penal code currently in the works will include a new category of crime, "unconventional delinquency," containing offenses previously punishable only with fines: tax fraud, capital evasion, land speculation and polluting the environment.

A GREEK COURT sentenced four executives of a chemical plant to five months imprisonment each for polluting the atmosphere and causing bodily injuries. The four appealed the verdict and were set free.

The sentences came when four workers of Ethyl Hellas Co., one of the country's biggest chemical companies, charged they suffered lead poisoning from emissions, and that the health of other workers was also affected. The company was established in the Northern Greek city of Salonica in 1965 and produces antiknock compounds.

After the workers' charges, measurements taken by authorities of Salonica port, where Ethyl has its installations, showed lead levels in the atmosphere much higher than those considered acceptable.

Ocean Management ...

SEVENTEEN MEDITERRANEAN coastal countries have agreed to finance half the \$6.4 million program to fight pollution in the Mediterranean Sea over the next two years. The budget, approved as an increase in the four-year (1976-1980) anti-pollution program financed so far almost entirely by the UN, will cover projects ranging from monitoring oil slicks to measuring mercury levels in tuna fish.

The coastal countries themselves, with Albania the only Mediterranean nation not represented at the meeting, agreed to raise \$3.2 million, leaving the balance to be paid by the UN Environment Program and other international organizations, notably the European

Community (EC).

MEDITERRANEAN COASTAL STATES voted to budget \$672,000 to run the Regional Oil Combating Center at Manoel Island in Malta. For two years, through last December, the Center was financed solely by the United Nations Environment Program. Malta's contribution consisted in making available, rent-free, the building for the Center.

The Center's functions include the exchange of information in emergencies, and research and assistance in the formulation of contingency plans at national, bilateral and international levels. The Center was opened in

December 1976.

SOVIET SPECIALISTS have designed a method for producing at much lower cost a ferromagnetic fluid that is highly effective in cleaning up ocean oil spills, Tass reports.

The Soviet news agency said the clean-up fluid originally had been developed by American scientists, but they had estimated its cost of production as "fantastically high.

Now, Tass said, specialists from Kharkhov in the Soviet Ukraine "have changed the technology and now obtain the same fluid at much

lower cost.

The fluid is first sprayed from an airplane onto the affected ocean surface. After the fluid interacts with the oil, the polluting film can be readily skimmed off using a ship equipped with special magnetic equipment (WER, Feb. 26, p. 1)

THE SPANISH GOVERNMENT is spending 7 million pesetas (\$101,449) on a pilot study of pollution in one of Spain's biggest tourist areas: the bay of Palma in the Mediterranean island of Mallorca.

The study, to be launched in April and expected to be completed by year-end, is the first of its kind in Spain and is expected to pave the way for other similar initiatives to clean up highly polluted resort areas.

One year after Amoco Cadiz, the oilspill damage goes on



PORTSALL. France—It is just one year after the supertanker Amoco Cadiz went aground less than two miles from this fishing village in Brittany, and spilled 230,000 tons of oil. Nearly \$100 million has been spent to clean up after the worst such disaster in history. More than \$1 billion has been claimed in U.S. courts by French interests for damages, and stricter anti-pollution legislation has been introduced by the French government. Yet the real damage, both economic and environmental, remains.

In economic terms, hardest hit have been the tourist hotel owners, who claim to have lost at least \$165 million as a direct result of Amoco Cadiz from April through June of last year.

It is not surprising, then, that hotel owners have joined restaurateurs, fishermen and other individuals affected by the oil spill in filing class-action suits in U.S. courts (the first ever by French citizens in the U.S. for damages resulting from pollution) to the tune of \$200 million. The suits name as defendant the Amoco International Oil Company, a subsidiary of Standard Oil of Indiana. The French government filed similar suits in U.S. courts, also naming Amoco and claiming \$300 million in damages, while municipalities and trade associations in Brittany have entered suits for \$366 million in damage claims. A departmental union of family associations has filed for another \$200 million in damages.

Since the disaster, on March 17, 1978, the French government has reportedly spent \$108 million to clean up sea and shore. It has also introduced several harsh anti-pollution initiatives, notably stiffer penalties for violations of shipping regulations, setting the maximum prison sentences for offending captains at one to five years and fines at between 100,000 and 5 million francs (\$24,000 to \$1.8 million). The regulations concern dumping wastes at sea, prior notification of load description and routes of ships transporting hydrocarbons in French territorial waters, as well as crew incompetence and negligence.

French Prime Minister Raymond Barre last October unveiled the Polmar Plan, which sets forth procedures to be followed at the national level for combating marine pollution. The French government was strongly criticized last March for the patchwork manner in which it coordinated the Amoco Cadiz clean-up. The text of the new Polmar Plan indicates the government now intends to create a sorely needed documentation and research center on accidental marine pollution.

Earlier, in July, the French cabinet had announced its \$35 million plan for preventing such disasters, which included construction of

three new radar stations along the coast, and improvement of the beacon system along the oil tanker routes in the Atlantic Ocean and the English Channel.

But clearly the most promising post-spill government initiative has been the setting up of a "Mission of the Sea," an effort headed by Aymar Achille-Fould designed to gather the maritime responsibilities of 15 government ministers and eight under-secretaries under one umbrella organization. The Mission, whose initial budget has been set at 2.5 million francs (\$588,000), will, among other things, draw up a national program for combating marine pollution and develop wide-ranging environmental protection policies intended to assure that the chances of another Amoco Cadiz happening are minimal.

Even so, estimates of the environmental toll of Amoco Cadiz have continued to climb. Today many scientists consider the situation desperate.

The sand along the Brittany shore, once thick-coated with Iranian and Saudi crude, has been cleaned. But scientists say some 50,000 tons of oil, brought in by the tides, remains trapped below the surface in the sand at the Bay of Morlaix, where half of Brittany's oyster production is centered. And while judging the full extent of the pollution damage on future sea life continues, it has been estimated that it will be more than a decade before edible oysters can again be grown. Moreover, commercial seaweed production—80 percent of France's total production comes from the area hit by the pollution—is likely to remain substantially below normal for several years to come, a situation that could in turn have disastrous effects on the food chain of many types of marine life.

In the past year, scientists put the total number of birds lost as a direct result of the oil-spill disaster at more than 20,000 and have said the eggs destroyed and young animals killed were "a very large proportion."

GARY YERKEY

Residents of toxic village scorn scientists' studies

LONDON—When excessive amounts of a toxic element were discovered in the soil of their village, Shipham's 1,200 inhabitants were angry—at the scientists who brought them the news.

Scientists from Imperial College, London, found up to 100 parts of cadmium per million in the soil of the Somerset village, and isolated readings ran as high as 998 parts per million—levels known to have caused kidney damage in Japan in the 1960s, the "itai-itai" disease. The contamination at Shipham comes from zinc mine workings, last used 120 years ago.

Villagers were warned by their local Environmental Health Officer on January 19th to reduce smoking and stop eating homegrown vegetables until a further extensive survey financed by the government departments of health, environment and agriculture is carried out.

Indignant at the influx of the media and the effect of publicity on property values, the villagers have protested their longevity

Environmental Legislation ...

THE INDONESIAN GOVERNMENT has allocated a total of \$1.04 billion for environmental development under its Third Five-year Plan. This includes forestry, land and water preservation, development of natural resources and the environment, meterology and geophysical programs.

TAX WRITE-OFFS for money invested in the manufacturing of anti-pollution facilities are planned for South Korea.

According to the plan, a three-year full holiday on income and corporate taxes will be provided to firms which produce anti-pollution devices or those that deal with the disposal of industrial wastes. For two more years following the full exemption, such firms will be granted a 50 percent tax break.

The plan also calls for customs duty cuts on imported anti-pollution equipment. Firms which install and use such facilities will receive tax breaks equivalent to 8 percent of their investment, according to the Ministry of Health and Social Affairs.

SWEDEN'S National Environment Protection Agency (NEPA) has proposed that the government forbid the use of cadmium or its compounds from January 1, 1980. Cadmium, in excess, can cause anemia, kidney and respiratory diseases. Plastic packaging, kitchen and other household wares are particular targets.

Satisfactory substances less dangerous to health and the environment already exist which can substitute for cadmium in most cases, NEPA said. Cadmium is being used increasingly in various alloys, as a stabilizer in plastics, as a color pigment and in glazing and enamelling. Household waste alone, for example, is estimated to contain 10 tons of cadmium annually. A ban would drastically reduce poisonous emissions into the environment with smoke when the waste is burned.

Considerable human intake of cadmium is through food and six months ago NEPA and health authorities ran a check of chinaware, pottery and similar food storage utensils on sale around the country to determine whether the permitted levels of lead and cadmium emissions from these products were being observed (WER, Sept. 25, 1978, p. 7).

The NEPA Products Control Bureau also proposed limiting quicksilver (mercury) as a seed disinfectant controlling fungi growth. The bureau estimated such a control would reduce the use of the pollutant for this purpose from 1.5 tons per year to less than 0.1 ton per year.

Energy Sources...

THE INDONESIAN GOVERNMENT has appointed an Indonesian-Italian team to conduct a feasibility study on the building of a nuclear power station in the country. The team is expected to complete the study in October this year.

Prospective locations selected for the projected station include Lasem and Muria in West Java. It has been estimated that a nuclear power station will need five to eight years to be fully operational.

INDONESIA AND WEST GERMANY have agreed on a "solar village" joint project in Indonesia. The project will be located in Jakarta and will serve as a model for transmigration centers where inexpensive houses will be built.

The two countries have also agreed to collaborate on wind and nuclear energy projects (including prospecting for uranium in Indonesia). Representatives from the two countries also discussed cooperation in the fields of marine and bio-technology.

CHINA HAS SOUGHT JAPAN'S cooperation in jointly undertaking research and development of solar and terrestrial heat in China, the Japanese Agency of Industrial Science and Technology said recently.

China reportedly plans to seek Japan's cooperation in designing a solar energy research center in Peking, undertaking a geographical survey of underground heat and preparing a utilization plan for terrestrial heat development in Tientskin.

IN PERU, the National University of Engineering (UNI) has started a research program with technical assistance from the University of Grenoble of France on ways of utilizing solar energy on a massive scale. As yet, solar energy is still in its infancy in Peru.

So far, the university has developed a model of selenium cells which are used to generate heat. It is hoped that research on the prototype will enable the UNI team to perfect experimental solar ovens which have been installed in a few homes in remote areas of the Andes. The rationale is that domestic uses of solar energy have to be exploited before moving on to large-scale projects in industry.

In addition, ITINTEC, the state office for technical research, is researching solar water heaters and windmills in the southern Andes of Peru.

and robust health. They say they have known of what they describe as "the metal" for 100 years and avoid patches of soil which turn the vegetables yellow.

Certainly there is no immediate evidence of disease or kidney damage in Shipham, and informed comment suggests there may be no real comparison with the Japanese situation even if cadmium content in the vegetables is similar. For example there is no malnutrition in Shipham, and there are also zinc deposits—both of which could slow up the intake of cadmium.

At a crowded public meeting on January 22nd government scientists were accused of "scaremongering" by angry villagers, but the government still insists on further surveys and research.

BARBARA MASSAM

Schoolchildren mount first Filipino nuclear protest

MANILA—In the Philippines' first organized anti-nuclear protest, a group of schoolchildren have written a letter to Australian Prime Minister Malcolm Fraser protesting his government's decision to sell uranium for this country's first nuclear reactor.

The letter was signed by some 200 children living in the town of Morong in Bataan province, the site of the nuclear plant (about 50 miles northwest of Manila). Construction began in 1977 and is about half-completed. The 620-megawatt plant is due to start operations in 1982.

The plant has sparked protests by anti-nuclear groups in the U.S., Europe and Australia, but this letter marks the first organized protest in this country. Although there are numerous Filipino foes of the nuclear project, demonstrations are outlawed here under martial law decrees, so protest has been limited to a few scattered letters from Filipino scientists to President Marcos. The government-controlled press has maintained a complete news blackout on the anti-nuclear views. A community discussion in the town of Morong was broken up by the military who termed the leaders "subversives."

The plant is being built by Westinghouse and is the most expensive plant of its size ever sold. The cost is \$1.2 billion, a cost that was originally earmarked for two plants. After disclosures in the foreign press of alleged kickbacks by Westinghouse to friends of the President in connection with the sale, as well as alleged improprieties in the granting of U.S. Ex-Im Bank loans and loan guarantees, investigations were started by the U.S. Congress, the SEC and the Justice Department. These investigations are continuing, as is a review of the decision to grant an export permit for the reactor.

In the meantime, however, Australia has agreed to sell nuclear fuel for the reactor.

The Philippine government had originally planned a series of 10 nuclear power plants, but given the high cost of this one plus the adverse reaction, it has quietly decided to limit nuclear power to this one unit.

BERNARD WIDEMAN

Eco-protests lead the Sudan to alter Jonglei Canal



NAIROBI—The Sudan government has announced a decision to realign the \$160 million Jonglei Canal in southern Sudan, in answer to continued pressure from environmental groups who feared that the original route would adversely affect both the land and the lives of people in the area. (WER, Sept. 27, 1976, p. 2; Sept. 26, 1977, p.1.

An official announcement by the Sudan's Minister of Irrigation, announced the government had accepted an alternative route further to the east.

The 350-kilometer (210-mile) route of the canal will now be increased by another 100 kilometers (62 miles), in order to take it through a sparsely populated area, instead of cutting through the traditional cattle migration routes of the 200,000 people living in

the longlei area.

Last year a Dutch survey team produced a report criticizing the original route, which it said would produce intertribal friction and over-grazing.

The cost of the change in route is expected to be considerable, as the canal's French contractors are expected to recalculate earlier cost estimates which have already proved to be too low.

The purpose of the canal is to divert the waters of the White Nile away from the Sudd swamps, reducing evaporation and making more water available for irrigation in the Sudan and Egypt. It will also ease river communication between north and south Sudan.

CHARLES HARRISON

Four alternative energy centers for Pakistan

ISLAMABAD—The United Nations Development Program has agreed to finance four rural alternative energy demonstration centers in Pakistan at a cost of more than \$800,000, said Dr. I. H. Usmani, Senior Energy Advisor to the UN Center for Natural Resources, Energy and Transport.

The government selected one village from each of Pakistan's

four provinces for the pilot project.

Dr. Usmani said each village would centrally generate 25 to 50 kilowatts of electricity. In addition each village will set up a community bio-gas plant for cooking fuel, which will be piped to each home.

Dr. Usmani said that if these centers succeed, large-scale duplication in other villages would reduce the cost "by a factor of five to 10."

MOHAMMAD AFTAB

Water Quality ...

LAKE VALENCIA, the largest fresh-water lake in Venezuela, had been shrinking and sickening fast. The city of Valencia and its surrounding industries have been siphoning water from the lake's sources and dumping wastes into them. Of 22 rivers which ran into the lake 150 years ago, all have either disappeared or been drastically reduced by deforestation and urban growth.

But now the lake will get a new water supply, piped in 150 kilometers from Pao Cachinche Reservoir. Ecologists expect the lake will have recovered its ecological balance in 10 years.

At the same time, the Environment Ministry has told 150 local factories to treat their wastes or move elsewhere. Government studies recommend also that lakeshore truck farmers not be allowed to farm within one kilometer of the water.

MOST STREAMS AND RIVERS in Kyonggi-do in South Korea have been polluted by industrial waste waters from factories, according to a recent survey conducted by the Seoul National University College of Agriculture.

The Kyonggi provincial government has decided to build a dam 778 meters long and 4 meters wide in the region to prevent further pollution of farmlands by industrial wastes.

MALAYSIA will be able to cope with large-scale oil spills in the Malacca Straits when a national contingency plan is put into force. Malaysian Science, Technology and Environment Minister, Tan Sri Ong Kee Hui, said that under the plan three operational centers will be set up at Port Klang, Penang and Johore. Each center will be manned by an area coordinator from the Marine Department.

THE PHILIPPINE NATIONAL POLLUTION Control Commission (NPCC) has ordered a mining firm in Benquet to pay the government a fine of \$135 a day for polluting the Agno River in Northern Luzon.

The firm was fined after its repeated failure to install anti-pollution equipment. Tailings from its gold and silver mining operations were said to cause damage to agricultural crops, aquatic life, and irrigation systems in the area. The penalty will continue until the firm installs the adequate anti-pollution facilities. If it fails to do so after six months, the firm will be ordered to cease operations.

In Asia ...

FILIPINO SCIENTISTS claim to have proven that coconut oil not only can substitute for diesel fuel but that it has cleaner emissions and causes less engine corrosion, the Philippine Coconut Authority (PCA) said.

PCA said crude coconut oil extracted from copra can be used to fuel motor vehicles without modifying their engines. However, they said production of coco diesel is impractical at the moment because it is too expensive.

PCA also announced that gas extracted from coconut husks can fuel stationary diesel engines, like irrigation pumps and generators.

ABOUT 5,000 of the 9,000 factories in Malaysia are affected by the Environmental Quality (Sewage and Industrial Effluents) Regulations that have been in force since January 1 this year.

For factories set up after the effective date, the regulations are effective immediately. For those in existence before the beginning of this year, there is a two-year grace period.

The regulations do not apply to palm oil and rubber processing factories because they are under the control of separate regulations. Also, small factories which produce effluents of less than 2,119 cubic feet (60 cubic meters) per day, and housing or commercial establishments with less than 30 units are not subject to the new regulations.

A RECENT SURVEY conducted by the South Korea Institute of Science and Technology on environmental attitudes and conservation in the country showed that a majority of South Koreans felt an urgent need for conservation of the natural environment and resources.

According to the survey 63 percent said the need was for their health while 21 percent said efforts were needed for the maintenance of a good and comfortable environment. Forty-eight percent were willing to pay an extra tax for preservation of the environment. In general, the more educated the respondents, the higher their interest in environmental conservation.

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Coconut fiber dust briquettes produced in Sri Lanka

COLOMBO—Ten years ago, a tall, grey-haired, ruddy-complexioned Swiss man boarded the locomotive of the narrow-gauge railway that puffs along the breathtakingly beautiful Kelani Valley line of the Sri Lanka Government Railway.

Adeptly using a shovel, he stoked the boiler of what Lankans call the "baby train" with an unfamiliar fuel. Instead of coal, briquettes made of coconut fiber dust kept the steam hissing with a clean fire that emitted neither smoke nor sparks.

The train reached its destination, Padukka, a station set in the midst of rubber plantations 22 miles out of Colombo, four minutes ahead of schedule. Fred Hausmann had proved a point but did not succeed in selling the machinery that would convert into usable briquettes the mountains of coconut fiber, or coir, dust that had been dumped for decades in the fiber milling areas of Sri Lanka.

But Hausmann, who runs a company of environmental and ecological engineers in Basle, has at last succeeded. He has sold a plant to the Ceylon Tobacco Company, a subsidiary of British American Tobacco, and the monopoly cigarette manufacturer in Sri Lanka.

Ceylon Tobacco which has installed the plant and has successfully made test runs producing fuel briquettes of paddy husk and coconut fiber dust plans to use the briquettes for firing tobacco barns that have been dependent on firewood.

Tests completed demonstrate that the briquettes produce more heat than an equal volume of firewood or a third the calorific value of heat emitted by burning fuel oil. There are other advantages as well. The briquettes are denser than other fuel material and take up less storage space. Since they are dry, no energy is used to get rid of moisture, and a uniform cylindrical shape makes handling and furnace control easy.

Ceylon Tobacco said that the pilot plant it has installed will produce 10 percent of the-fuel required by their tobacco barns. The company's experience is being closely watched, particularly by the tea industry which uses large volumes of firewood and fuel oil for firing driers. Briquettes have already been successfully used in tea production by one estate where a test was run.

"I am not the inventor of briquettes," says Hausmann. "They've been used from the turn of the century. But coconut fiber dust briquettes have not been commercially produced before."

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US and Soviets agree to work on 41 environmental projects

WASHINGTON—U.S. Environmental Protection Agency chief Douglas M. Costle has come home from Moscow with an agenda listing 41 environmental projects the U.S. and the U.S.S.R. will work on jointly in the coming year. They cover 11 areas, ranging from protection of the marine environment to assessing the influence of pollution on climate, and from earthquake prediction to prevention of pollution associated with farming.

Costle headed the U.S. delegation of representatives from twelve government agencies, and is co-chairman of the committee monitoring the 1972 bilateral cooperative agreement on environmental protection with Yuri A. Izrael, chairman of the U.S.S.R. State Committee for Hydrometeorology and Control of the Natural Environment.

Some projects the delegations agreed to in their week-long meeting already are underway; others will begin soon. In the next few weeks, for example, the Soviets will send to the U.S. an ocean skimmer designed to clean up oil spills. A U.S. team will test the vessel and evaluate it for the Soviets. The exchange could result in improvements in both countries' ocean skimmer designs.

Other upcoming projects include:

 a comparison of emergency measures taken in response to toxic chemical spills;

• a study of the effects on humans of working in the oil shale industry, for which U.S. scientists will visit a production site in Estonia:

• a visit by the Russians to a U.S. area in the early stages of energy development, perhaps coal fields in Colstrip, Wyoming. Later, Americans will travel to a comparable site in Russia;

• studies of Arctic animal life in Russia by a U.S. scientific delegation:

• an exchange of information on technology to control air pollution from automobiles.

During the past year the two countries concluded talks on a migratory bird convention protecting species that travel between the U.S. S.R. and the U.S. They agreed to work on similar bilateral conventions protecting other threatened species of wildlife.

Earthquake prediction has been an ongoing project since 1972. The committee also discussed a common complaint: Scientists from both countries say they have not been granted enough access to information, facilities, and some areas. The committee concluded that major needs were being satisfied and agreed to try to cooperate more fully where they were not.

The committee will meet again in a year's time. Since the last review of the agreement, in November 1977, environmental experts from the two countries have met in more than 100 exchanges.

JUDITH H. DOBRZYNSKI

In Europe ...

THE FIRST CLASS OF GRADUATES from the Faculty for Environment of the USSR at the Technological Institute (University) of Leningrad are about to assume their new positions, the Novosti news agency reported from Leningrad. They will work in business, laboratories and in design bureaus on matters relating to maintaining a clean biosphere as well as effective utilization of natural resources, the agency said.

ROMANIA, which ranks high among those countries with rich thermal resources, has begun to tap these springs for heating purposes in the western areas of the country.

The national news agency Agerpress reported that in Oradea, where thermal springs with temperatures of 100 degrees Celsius are found, specialists have perfected heating systems for dwellings and greenhouses. In the Nufarul district of Oradea, more than 1,500 flats are heated with thermal water.

The agency added that prospecting will also be carried out in the Danube plain, where more thermal springs are believed to exist.

Iceland has long used its thermal springs for domestic and commercial heating to the extent that its greenhouses even produce oranges for export.

THE HUNGARIAN GOVERNMENT has announced that by 1990 at least 90 percent of the population will be connected with the drinking water network. When the first phase of the program is completed at the end of this year, 75 percent of the people and 50 percent of the homes should have running water.

The expansion will bring 900 communities into the network and also enable land to be irrigated that up to now has suffered severely in a succession of dry summers. The plan includes measures to protect the water supplies from growing industrial pollution and to create new reserves.

WHILE ALL ARE AWARE of the environmental damage caused by the extensive use of brown coal, or lignite, it cannot at present be replaced by other fuels in the Czechoslovak power station system, a conference in Prague was told recently.

According to statistics presented, only about 10 percent of electricity was gas or oil produced in 1977, the rest came from hydro power and solid fuels. Of the solid fuels, three quarters was lignite. If lignite were to be replaced by oil, production costs would be doubled, if electricity was imported, costs would triple.

UNEP should be political, says Soviet official

MOSCOW—A senior Soviet diplomat has sought to rebut Western arguments that the United Nations Environment Program should steer clear of politics because environmental protection is basically a scientific and technical matter.

Writing in the Soviet journal International Affairs, Ambassador to Kenya Boris P. Miroshnichenko noted that "some Western spokesmen have been quite often heard to claim that this is a technical problem and, therefore, UNEP should keep aloof from politics."

"Its actual experience, however, points to the contrary," said Miroshnichenko, who has had extensive experience in dealing with Nairobi-based UNEP.

Miroshnichenko pointed to provisions of the 1975 Helsinki accords as an example of constructive political action helping to create an improved climate for environmental cooperation.

SPECIAL TO WER

Czech-Austrian relations strained over nuclear plants

VIENNA—Czechoslovakia's plan to have twelve atomic power stations operational within the next six years threatens to become a major issue at the forthcoming Austrian general election on May 6th. Since Austrians, in a referendum last November, rejected by the narrowest of majorities the use of atomic power stations in their own country, they have become increasingly aware of the fact that Czechoslovak power stations are located sensitively close to the Austrian border and that there is no national or bilateral "accident" contingency plan.

The Austrians are most concerned about the two reactors already operational and one under construction at Bohunice not far from Pressburg (the experimental Bohunice plant went operational in December, 1972). Shortly after the Austrian referendum a technical report was leaked to the West concerning accidents at Bohunice that killed some employees and exposed others to more than the permissable dose of radiation during repairs.

During a short meeting between Austrian chancellor Bruno Kreisky and Czechoslovak premier Lubomir Strougal near Brno on January 26th the subject was officially discussed. After the discussion Premier Strougal said publicly that there was no question of changing the locations of the present and future atomic power stations—three at Bohunice, one at Brno, four at Dukowany and four at Levice in Slovakia—for only in the south was there a sufficient water supply for cooling.

The Czechoslovak premier promised the Austrians full information on the structure of the power stations, and said it had been agreed that groups of Austrian experts could inspect the Czechoslovak power stations if required. The accidents at Bohunice, he said, were purely mechanical and involved no radioactive pollution. They had been reported to the International Atomic Energy

Agency in Vienna. This was confirmed by the Agency. The reports, however, are not available to the public. They are only for internal circulation among the Authority's experts.

The main criticism now leveled against the Austrian chancellor both by the opposition and by part of his own Socialist party is that no discussions with Czechoslovakia have yet been held on a mutual "disaster plan". Should an accident occur, there is no contingency plan for Austria to be warned if dangerous pollution is heading its way. Nor do the Austrians themselves have a plan to deal with such a situation.



Ironically, one of the present sources of tension is that the Austrians think Czechoslovakia is charging extortionate fees for transporting coal by pipeline across their territory from Poland to Austria. Austria balances its exports to Eastern Europe by importing large quantities of East European energy. Now that the Eastern European electricity networks are being linked up, and Austria in turn is linked into them, it is possible that in the not too distant future Austria will be importing electricity generated by the atomic power stations now causing a political storm.

SUE MASTERMAN

Norway will have wave energy power plant next year

OSLO—Norway expects to have a wave-energy power plant in operation by 1980-81. If all goes according to plan, and if the test project proves to be a profitable operation, Norway should be in a favorable position for developing wave power plants from the beginning of the 1990's, says Professor Johannes Falnes of the Institute for Experimental Physics at the Institute of Technology (NTH) at Trondheim.

He said the idea is to construct a power plant consisting of several "power buoys" working on this principle: Waves will swing the buoys up and down in relation to a mooring. Within the buoys there is a hydraulic piston cylinder system which can be coupled to gas accumulators and a high and a low pressure tank. As the buoys move up and down some of the hydraulic fluid is pumped from the low pressure tank to the high pressure tank, and a turbine, which is placed inside the low pressure tank, converts that energy to electricity.

The Norwegian Water Resources and Electricity Board (NVE) believes wave energy could double the energy presently provided by Norway's conventional hydro-electrical power stations.

SPECIAL TO WER

More on Europe ...

THE TRANSPORT OF RADIOACTIVE materials will be studied soon by the European Community (EC) Commission. Although the amount of radioactive material transported within the EC remains relatively small, the Commission decided to start the study as the quantity is expected to increase significantly in the coming decade.

Until now, rules governing the transportation of radioactive materials internationally have been the exclusive concern of the United Nation's International Atomic Energy Agency. The EC has had no rules of its own.

EC Commission experts have now been instructed to consult with national authorities on the problem of writing its own rules and to report back within the year with "concrete recommendations for precautionary measures to be taken."

NINETY PERCENT OF AUSTRIAN consumers would choose products grown on biological (organic) farms rather than those grown with the aid of chemical pesticides and fertilizers, if the price of both products was the same. This is one result of a survey carried out by the Ford Institute in Vienna.

Of the 200 farmers in Austria who have turned to biological farming, 61 percent now claim they have a higher income and 25 percent say that their income is higher without charging higher prices for their products. Thousands of Austrian farmers are reported to be seriously considering switching to biological farming. A recent film on this subject screened by Austrian television produced so many reactions from farmers that it was repeated on a Sunday afternoon.

SPANIARDS have little or no opportunity for studying environmental sciences, a Madrid symposium found recently. Speakers lamented the fact that only two universities in Spain offer environmental studies and said more initiatives are needed similar to those launched by the United Nations Environment Program.

BRITAIN'S BIGGEST chain of clothing stores, Marks and Spencer Ltd., says that last year their energy-savings efforts saved them £2.5 million (\$5 million), and a total £8.2 million (\$16.4 million) over the past 5 years.

The savings involved a total capital investment of £1.25 million (\$2.5 million), plus a determined effort from employees. Largest savings came from the installation of more efficient fluorescent lighting on the sales floor, which cut the lighting bill by half and cut down on air-conditioning needs.

Next year "Marks & Sparks" will install waste heat recovery equipment for refrigerators serving their food section.

Environmental Legislation ...

POLLUTERS in the nine member nations of the European Community (EC) may soon find it more difficult to hide behind national boundaries in cases where pollution has crossed frontiers.

The EC Commission indicated, in response to a question raised in the European Parliament, that it may introduce measures whereby legal action could be initiated by citizens of one EC country against another, polluting, country. The Commission said experts will study ways in which border residents whose environment might be affected by a proposed industrial plant in the neighboring state, could have their say in granting permission for building the plant.

The issue of transnational pollution has gained increasing attention within the EC in recent years. It has been raised principally in connection with discussions about waste carried down the Rhine River, and who pays, and about pollution borne by the wind, mainly from the heavily industrialized Ruhr Valley in

West Germany.

IN NORWAY a disputed new regulation requires that private homes must be built with

chimneys.

"The minimum requirement is that all new houses shall have alternate heating systems," the Ministry of Municipal Affairs said. The new regulation is disputed because a chimney increases construction costs by \$2000 to \$4000. Most people prefer electric heating as hydroelectric power supply is readily available.

HARSHER PENALTIES for violating Sweden's environmental protection laws have been recommended to the government by a commission assigned to update legislation in this field.

Recommendations include doubling imprisonment from one to two years maximum, an increase in the time within which violations may be prosecuted from two to five years, and a sanctions system for excessive discharge of

pollutants into the environment.

Under the sanctions system a factory, for example, could be assessed a so-called "environment protection fee" of up to 25,000 Swedish Crowns (\$5,800) a day as long as it continued to discharge pollution beyond the current limitations. Thus, it would be made unrewarding to ignore or violate regulatory conditions.

The commission also would extend authority to see that laws and regulations on environment are obeyed down to local community health boards. The task now lies on a national and provincial government basis, but the resources there aren't equal to the job.



Acid rains will increase, says leading Dutch scientist

AMSTERDAM—A Dutch chemist predicts that the heavens will increasingly rain acid with harmful ecological effects not only in his own country but in many other industrial areas of the Western hemisphere. Dr. Arend J. Vermeulen, 32, was the first scientist to find a pronounced and direct relationship between air pollution by sulphur and nitrogen oxides and acidification of precipitation. In the atmosphere the oxides are changed into nitric and sulphuric acids which are soluble in water. In large areas of the Western hemisphere rain can be considered a dilute solution of acid.

Vermeulen said that though little is known yet about the magnitude of the threat, it is a serious problem in sensitive areas. Some of the dangers are acidification of natural water sources and freshwater systems, leaching of the soil, damage to vegetation and corrosion of materials.

Around 1966 the highest acid rain measurements in the world were made in The Netherlands where three of the 150 European network monitoring stations are located. They coincided with a

maximum emission of sulphur dioxide.

Thereafter acidification decreased, partly because of desulphurization under the Clean Air Act, but mainly because of increasing use of natural gas for fuel needs. This favorable development will soon end. Under its new policy the Dutch government is reserving natural gas only for domestic heating until 2000. Power stations will increasingly have to rely on coal and oil. Vermeulen expects that by 1985 air polluted by sulphur emissions will be as bad as in 1966.

Vermeulen's report came as a shock for environmentalists here. Within a week after publication he got more than 500 requests for copies. The most striking effect of acid rain and consequent soil acidification in The Netherlands is in its effect on plant life. An example is the great loss in diversity of lichens. There were 117 species before heavy industrialization began after World War II; there are only 47 now. Fortunately Holland's surface waters have enough calcium carbonate so the acid effect is neutralized.

It is different in Scandinavia, where damage done by acid rain is widespread and increasing rapidly. A major part of Western Europe's air pollution is transported in a northeasternly direction towards Scandinavia. At an average wind velocity, distances of 1,000 kilometers or more can be covered in two to four days. The inland waters in Scandinavia have an extremely low neutralizing capacity. Large areas are quite vulnerable to pollutants deposited from the atmosphere. Acidification of fresh waters, with the disappearance of fish, frogs and other water organisms, has been particularly rapid over the last decades. In the Tovdal river catchment area in southern Norway, an area with 266 lakes, 48

lakes were without fish in 1950. By 1960 the number of fishless lakes had increased to 75 and to 175 in 1975!

A situation comparable to that in Scandinavia is found in the Adirondack Mountains in New York.

It was found in Sweden that the growth of fir trees was hampered by acid rain. Trees and needles were undersized. In The Netherlands tomatoes watered with acid rain grew 50 percent slower. In Denmark suggestions have been made to calcify lakes to offset acidification. In the Dutch province of Friesland calcifying pasture land suffering from acid type moss had good results. But, Vermeulen said, this only can be done for relatively small areas. It is impractical for the vast Scandinavian lands.

What solution then, Vermeulen was asked. There was only one: clear the air as much as possible from sulphur and nitric oxides.

HENK KERSTING

Spain's anti-nuclear forces growing and organizing

MADRID—As Spain's Socialist Party campaigned on a platform to halt nuclear construction, leading opponents of nuclear development in Spain formed a group to pressure the government to change its plans.

The new committee surfaced in Madrid only days after the Basque General Council asked the International Atomic Energy Agency to make a detailed report on a \$1 billion nuclear plant nearing completion in Lemoniz, near the Basque city of Bilbao. The plant, now in its sixth year of construction, has been the scene of some of Spain's largest anti-nuclear demonstrations.

Launched by some 200 personalities from universities, politics, unions and business, the new Committee for a Nuclear Moratorium and Popular Plebiscite said its prime aim was to awaken Spaniards to the realities of Spain's nuclear program, which plans some 16 plants to supply 15 percent of Spain's total energy needs by 1987.

"The risks that an industrial society runs in developing economically—fundamentally, that of radioactive contamination—cannot be decided by a technocratic minority," the committee said in its manifesto. "On the contrary, from now on, it must be we citizens who accept or reject this type of risk."

Citing private polls showing that more than half of those questioned had no idea what a nuclear plant was, the committee said it favored a popular vote on whether to go ahead on nuclear energy—but not before two years of public debate.

The committee's position was considerably strengthened in the first days of February when the Socialist Party, running neck-and-neck with the centrist government party in the rundown to Spain's March 1 general elections, issued an economic program including a halt to nuclear construction and planning.

The Socialists said that in case of election victory—an eventuality generally considered unlikely but not impossible—they would paralyze all nuclear activity in Spain and withhold any new building permits in order to let the nation vote on its own energy future.

IULIE FEINT

Energy Sources...

IN 1975, the United Nations Environment Program decided to set up three alternative energy demonstration centers—in rural areas of Sri Lanka, Senegal and Mexico.

The latest report of UNEP's energy task force says, "Unfortunately, three years have passed . . . and the progress in its implementation has been very inadequate."

"It is very doubtful that the Rural Energy Center of Sri Lanka will be operational by the end of 1979." The task force believes 1980 may now be the start-up date for Senegal, with the Mexican project following later.

The plan was to demonstrate how renewable energy sources—solar, wind, biogas and hydro power—can make small rural communities self-sufficient in energy. Many are so small rural electrification schemes cannot be justified, nor can they afford oil to power generators.

UNEP's energy task force noted that several experimental or demonstration projects have been initiated by other UN bodies and are progressing rapidly. "It is unfortunate that UNEP is lagging behind."

SOLAR ENERGY in isolated parts of the Third World could cost less than diesel-generated energy by 1980, according to Henry Durand, president of the French government organization that administers solar-energy research funds, *le Commissariat a l'energie solaire* (COMES). Speaking to a solar-energy seminar held in Toulouse recently, Mr. Durand said that his agency's allocation for solar-energy research had been boosted for 1979 to nearly 100 million francs (\$22.7 million), about 20 percent of it for pilot projects in photovoltaic conversion.

For years, France has been a leader in Europe in the development and sales of photovoltaic equipment to the Third World. The new solar-energy R&D program is expected to hasten industrialization, lowering the per-unit cost of solar equipment.

THE SOUTH AFRICAN GOVERNMENT'S Electricity Supply Commission is considering building new coal-power stations far away from the coal mines where they are now located.

The reason is that the current power stations are creating a serious pollution problem. Because winters on the central highveld are cold and windless, temperature inversions often occur, blanketing the area in smoke and sulphur and carbon dioxides.

For example, four power stations east of Johannesburg burn 120,000 tons of coal daily, producing 16,000 tons of fly ash and at least 600 tons of sulphur dioxide every day.

Forestry ...

THE THAI GOVERNMENT has approved a plan to reforest 300,000 acres.

Half the reforestation will be implemented by the Forestry Department. Another 45,000 acres will be planted by the Forestry Industry Organization (FIO) and concessionaires all over the country, and the remaining 105,000 acres will be reforested by the private sector which will be hired by the Forestry Department.

There is one problem: Some of the forests have people living in them. If the government tries to reforest the areas by moving the people out, it could result in the forests being destroyed. In order to solve this problem, the FIO has been implementing the forestry village program by providing cultivation areas for the villagers and hiring them to carry out the reforestation activities.

GREEK ENVIRONMENTAL ORGANIZATIONS have blamed the government for having permitted the chopping down of thousands of fir trees for Christmas.

They said, "instead of increasing the country's already restricted greenery, the government encourages its diminishment."

A combined announcement by 14 private environmental groups said the justification given by the government, that this year's fir trees were taken only from special plant nurseries, was "baseless and naive." It added that as usual the illegal cutting of Christmas trees was not controlled and as a result "thousands of fir trees died this year again on sidewalks, waiting in vain for purchasers."

In 1976 the Ministry banned the cutting of Greek fir trees, necessitating the importation of Christmas trees. The measure has not been applied since then, and environmentalists termed this "catastrophic."

A VENEZUELAN ENVIRONMENT MINISTRY survey of the Amazon territory south of the Orinoco River recommended that more than 60 percent of this largely virgin area be maintained in its natural state. Of the 4 percent considered suitable for agriculture, experts said the acid soil would severely limit the type of cultivation permitted.

The study, which is to cover the 175,750 square kilometers of the Amazon Federal Territory by 1981, is using SLAR radar and Landsat satellite remote sensors.

But several projects have already been undertaken in this area, notably the government development plan known as "Conquest of the South" launched in 1968 to bring in settlers and farmers. In 1972, the army-built road to Brazil was finished along which travel fleets of trucks bringing lumber to Venezuela in exchange for gasoline.

EC environment ministers hold lackluster meeting

BRUSSELS—The European Community (EC) ended its semiannual meeting of Environment Ministers in lackluster fashion by failing to come to agreement on several issues environmentalists consider crucial.

While they approved measures on bird protection, adherence to three maritime conventions and the quality of drinking water, the Ministers failed during their two-day meeting to tackle water pollution caused by wood pulp mills and certain chemical substances. At issue in both cases was the difficult matter of pinning blame on individual nations for situations that extend beyond national boundaries.

The Ministers did manage to move ahead on another matter of concern to Community industry, namely, assessing the additional costs, or savings, resulting from efforts to fight pollution. The Ministers drew up detailed guidelines that industries throughout the Community are expected to use in estimating pollution-fighting costs and savings.

GARY YERKEY

British rainforest expedition starts its study in Panama

PANAMA—The world's rainforests are being destroyed at the rate of 50 acres a minute, say spokesmen for Operation Drake, a British scientific and exploratory expedition studying Panama's tropical rainforest from a base camp on Caledonia Bay on the Caribbean coast.

Major Jeremy Groves said the expedition will conduct a comparative study of the tropical rainforest canopy in Panama, Papua New Guinea and Sulawesi, Indonesia, to learn more about how rainforests regenerate.

To aid in the study, the expedition will construct aerial walkways in the rainforest canopies about 45 meters above the surface.

Teams of botanists and zoologists will be able to study the effects of insect and bird pollination on forest regeneration from the platforms.

Two British scientists, F. R. Whatley, a professor of botany at Oxford, and Dr. S. L. Sutton, a zoologist at Leeds, are supervising the study.

At the current rate of destruction, most lowland rainforest areas will have ceased to exist in 20 years, causing incalculable effects on the earth's eco-system, Operation Drake spokesmen said.

ELLIE FENTON



Dieback fungus is killing Australian woodlands

PERTH—In Western Australia, which is the size of Texas, Japan and the British Isles combined, forests cover only one percent of the state. Because the people are almost isolated by the Indian Ocean to the west and the Great Sandy Desert to the east, they rely heavily on their oases of jarrah forests for hardwood. And they are fiercely protective of them—especially now that these forests are being attacked by a fungus disease that has already destroyed 46,000 hectares and is spreading.

This year the state Forests Department begins a six-year aerial mapping program to determine just how far the lethal dieback fungus has spread. It takes six years because only 15 days a year during the autumn months of April and May-are suitable for cloud-free, windless aerial photography. Each 15-day venture will

cost more than \$200,000.

Pilot and photographer will fly over 720,000 hectares of guarantined land and try to find out where the disease is located, how bad the damage is, and how safe access to the forest can be

The fungus (Phytophthora Cinnamoni) was brought to Australia during the late 1800s to become—as rabbits have—a scourge, not only here but world wide. It lives in soil and rots the feeder roots of plants, and it can be carried into healthy forested areas in dirt JANE NACZYNSKI-PHILLIPS caught on vehicles.

A Rhodesian says he will turn raw sewage into drinking water

SALISBURY—A breakthrough in methods of turning new sewage into high-standard drinking water is expected in Rhodesia within two years.

Salisbury city engineer John McKendrick believes Rhodesia may be the first country in the world to achieve direct transition. The chemical processing he has devised takes about five hours.

McKendrick has been invited to submit a paper on his process in March to a six-day symposium in Washington on "Water Reuse-From Research to Application."

He said, "We think we may be the first here to produce water in this way which is well up to the standard of the World Health Organization.'

McKendrick explained the basics during a few minutes break from compulsory para-military police duties: Alum flocculation as a first step is followed by clarification, then follows a procedure including several chlorination steps.

A similar system is used in South West Africa starting with treated effluent, but the McKendrick method takes it right back to

the raw sewage stage.

Money shortages due to military commitments mean that two years will be needed to complete further research, which could otherwise be achieved in months, McKendrick said.

McKendrick explained that recycling research is essential because Rhodesia has one of the highest population expansions in the world, nearly four births per thousand. JOHN KELLEY

In Africa ...

THE KENYA ARMY has been mobilized to support a new anti-locust control unit set up by the government to meet the biggest locust threat to Kenya for many years. Spraying aircraft and ground control teams, with large supplies of insecticide, have been stationed across northern Kenya to intercept swarms of locusts moving south from the Horn of Africa, where large-scale breeding has been taking place over

Kenya's operations are reinforcing those of the Desert Locust Control Organization for Eastern Africa, of which Kenya is a member. Holland has given Kenya \$5 million, and West Germany has given \$3.5 million for the

operation.

AFRICAN GOVERNMENT policy-makers and planners, representatives of the Organization of African Unity (OAU), UN agencies and other international bodies are to meet in Addis Ababa in early March to discuss alternative patterns of development and life-styles of the African region.

Jointly sponsored by the UN Environment Program (UNEP) and the Economic Commission for Africa (ECA), the seminar is regarded as a major event in celebrations marking the 21st

anniversary of ECA.

By reviewing the results of past development efforts in Africa, while comparing experiences relating to the different African socioeconomic systems, the seminar should provide guidelines for accelerating African development, an ECA spokesman said.

UNEP will submit a basic document focusing on environment and development perspectives in Africa, stressing the need to frame development plans on environmentally-sound

IN SOUTH AFRICA, river trails are being set up through suburbia.

Because the nation's cities have been growing rapidly since the 1950s, the only public areas left are ridges and river valleys. In Johannesburg and Pretoria, during the rainless winters, the only runoff is effluent. New houses literally turn their backs to the river scene, and the streams have become dumping grounds.

Now town planners and local authorities are landscaping suburban streams, and local groups are clearing them of discarded cars and other rubbish. In the Pretoria-Witwatersrand region, where four million people live, authorities are planning to link these strip parks into unbroken urban trails that lead into open country.

But, public utilities have found that these open routes cost very little to expropriate. One stream system in the town of Sandton, which cost more than \$3 million to develop as a park, will now bloom with a line of giant pylons. Others have been earmarked for roadways.

Briefly...

THE ENVIRONMENT INDUSTRY COUNCIL will hold its Third Annual Meeting Feb. 28-March 1, in Washington, D.C. Contact: Environment Industry Council, 1825 K Street, N.W. Washington, D.C. 20006.

TO STIMULATE new and more effective techniques in handling and recycling waste, the Swedish government has set aside 59 million crowns (\$13.7 million) as this year's budget, a sharp increase from 34 million crowns (\$7.9 million) last year.

THE SOUTH KOREAN government has extended the ban on game hunting in the country for three more years until 1981, the Office of Forestry announced. The ban was originally slated to end in 1978. At present, Cheju-do is the only place where game hunting is permitted.

THE PHILIPPINE FERTILIZER and Pesticide Authority (FPA) has started a year-round pesticide residue analysis on vegetables, food crops, fish and other marine life to determine their safety to the end-users.

THE SOUTH KOREAN government has decided to liberalize import restrictions on home solar collectors as part of its program for developing solar energy as an alternate energy source, the Ministry of Energy and Resources said recently. The government has lowered the tariff rate on solar heat collectors from 60 percent to 15 percent.

IN INDIA, a new island, almost 50,000 square kilometers in size, is being formed in the Bay of Bengal, according to aerial photographs. Environmentalists believe the island is made up of soil washed down from the Himalayas and other watersheds since deforestation in those areas has led to serious soil erosion.

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Bangladesh works with UNEP on environmental programs

DACCA—The Bangladesh government is investing \$1.75 million in local currency this year in environmental programs.

This fund, which is supervised by the national Environment Pollution Control Board, will be used primarily for preventing water pollution. Projects include a detailed survey of industries to determine the extent of industrial effluents in water systems, establishing a data bank, and setting up of permissible levels of different toxic ingredients in water. Ten monitoring stations have already been established in the major industrial belts.

In addition, the autonomous municipal corporations and the Public Health Engineering Department will be executing programs involving \$30 million that indirectly help the environment. These encompass provisions for sanitation in rural areas and in urban shanties, proper planning of urban settlements and a rural water supply system.

"The major environmental problems for Bangladesh are not only due to industrialization but also due to underdevelopment and the pressure of population," says Dr. S.H.K. Eusafzai who heads the high-powered 16-member inter-ministerial Environmental Pollution Control Board. The United Nations Environment Program is currently providing the Board with both expertise and financial assistance.

AHMED FAZL

Decent housing in Mid-East a victim of land speculators

NAIROBI—Land speculation is holding up improvement of poor housing in most parts of the Middle East. This is the conclusion of two experts—Naigzy Gebremedhin, of the Human Settlements Technology Program of the United Nations Environment Program (UNEP), and Marwan Mohsen, of the Economic Commission for Western Asia (ECWA)—who have been visiting West Asian (Middle Eastern) countries to assess their human settlements problems.

"In most cases, the shortage of land is an artificial problem caused by speculation," Gebremedhin commented. He regretted that most West Asian countries lack a clear policy on housing strategy. Despite the urgent demand for more housing, many cities and towns in the Middle East have large undeveloped areas. And people seeking cheap land must move far from central services (such as schools and shops), far even from work opportunities.

To compensate, too many housing authorities turn to importing industrialized systems which can produce large numbers of houses in a short time. But these systems do not use traditional local building materials (ranging from soil, mud and stone to reeds and grass) which have good thermal insulation properties.

The mission suggested development of a prototype low-cost "autonomous" house—self-sufficient (as far as possible) in energy, built of local low-cost materials and recycling its waste and water.

CHARLES HARRISON

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In This Issue...

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German canal to join North Sea with Med & Black Seas

Germany's dream of connecting North Sea with Mediterranean and Black Seas is due to come true in 1985 1

Romania will spend billions on river control to save the land from recurrent floods and drought. 2

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French nuclear engineers can now turn liquid nuclear wastes into glass blocks, a low-risk method of waste disposal. 4

Apparently dissatisfied with the state of environmental protection in the USSR, the Kremlin has issued a strongly critical policy statement. 5

West Germany's Justice Minister has asked Parliament for a strong environmental crime law, and chances for passage look good. 5

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South African scientists suggest that since they have plenty of coal, it should be used to fuel vehicles. 6

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Japan's Environment Agency tested its rivers, lakes and seas and found the water quality is worse 8

Five Asian states have asked for more United Nations help in solving the region's environmental problems. 8 MUNICH—A centuries-old dream of a canal connecting the North Sea to the Mediterranean and Black Seas is scheduled to come true in 1985, but for many Bavarians its spin-off effect will be even more important.

For completion of the final stretch of the canal will permit this huge southern German state to effect a complicated interbasin water transfer system between the Danube and Main Rivers that will, in effect, balance the supply between the water-poor north and the water-rich south.

Bavarian officials believe the impact will be enormous on Germany's economy, environment, agriculture, acreational facilities, industry, drinking water supply, flood control and hydropower.

According to Dr. Reinhard F. Schmidtke, Building Director for the Bayarian Water Authority, the water transfer scheme became practicable when the 1921 plan to connect the Rhine and Danube was furthered when the Danube was extended to Nuremberg by canal. Then the "jump" across the so-called continental divide became realistic, he said.

The "continental divide" between the North Sea and the Black Sea separates Bavaria into north and south. The southern section, about two-thirds of the total area, belongs to the Danube River basin, while the northern part drains chiefly into the Rhine River, using the tributary Main River.

There is a vast difference in natural water resources between the two. The Main River basin has considerably lower water availability and greater population density. In addition, the flow pattern of the Main is much more irregular than that of the Danube. Therefore, Dr. Schmidtke pointed out, the possibilities of water supply and waste disposal are less by nature in the Mainto-Rhine region.

He explained that the more favorable water situation in Southern Bavaria gave rise to the plan for an interbasin transfer to balance water resources between the two regions.

The plan was adopted by the Bavarian Parliament which authorized financing in 1970 of 560 million marks (about \$295 million).

The canal project has continually come under fire from environmental groups. Opponents note that the last link will sever the country's largest state park in the Altmuehl Valley. They claim also that the canal is economically unviable, and that it would open German waterways to "invasion" by the price-cutting Soviet fleet.

Simultaneously, Rhine and Danube nations have mounted intensive efforts to curb pollution of both rivers. Purification plants have been built (a new federal law will make towns and

In Europe ...

SCIENTISTS FROM 12 COUNTRIES gathered for a four-day symposium in Yurmala, Soviet Latvia, to discuss problems of organizing a worldwide system for observing man-caused changes in the biosphere.

The proposed international information network would provide for continuous monitoring of air, water and soil conditions, pollution sources, and reactions of both plant and animal life to adverse environmental factors, Tass reported.

Attending the mid-December symposium were scientists from the Soviet Union, the United States, Britain, Canada, West Germany, Switzerland, Kenya, Bulgaria, Hungary, East Germany, Poland and Czechaslovakia.

It was held under the aussices of the World Meteorological Organization and the United

Nations Environment Program.

THE SLOVNAFT OIL REFINERY at Bratislava, Czechoslovakia, is reportedly seeking techniques for drastically reducing the sulphur content of its emissions. The refinery's two thermal power plants discharge 1,800 kilograms of sulphur dioxide per hour into the amosphere. The refinery-petrochemical complex is situated close to the Danube River, some five miles downstream from the Austrian/Czechoslovak frontier.

SOVIET ENGINEERS in the Ukrainian city of Kharkov are planning to street-test taxis and buses that are powered by a pollution-reducing mixture of gasoline and hydrogen.

According to the Soviet news agency Tass, the researchers are seeking to develop a practical gasoline-hydrogen system that eventually could be utilized on a wide scale in the Volga, a medium-sized Soviet auto.

Plans now call for starting day-to-day operation of hydrogen-powered vehicles along public transport routes in Kharkov—a major industrial center of 1.4 million—by 1980, Tass said.

"UMWELTDATEN 78" is the first compendium of environmental conditions in Austria. The "Environmental Data 78" publication was released recently by the Austrian Central Statistical Agency jointly with the Federal Ministry for Health and Environmental Protection.

A wealth of facts and figures is contained in the volume which was researched and written over 36 months.

One interesting result of the survey is that 54 percent of all people polled felt that noise—not smoke nor the quality of air or water—is the main cause of complaints.

companies contribute to purification plants if they haven't acted themselves by 1981). At the same time, a system of heavy fines and public pressure on industries has brought about an encouraging improvement. An International Danube Commission attempts to coordinate such activities, and agencies, such as the United Nations Economic Commission for Europe, have been nudging riverine states into cooperation.

The five countries touched by the Rhine (West Germany, France, the Netherlands, Luxembourg and Switzerland, together with EEC as a whole) signed a set of accords in 1976 to limit the discharge of chemicals into the Rhine and its tributaries.

WILLIAM G. MAHONEY



Romania to spend billions on river control programs

BUCHAREST—Romania is planning to spend \$83 billion to control its rivers and save the country from the destructive effects of recurrent floods and droughts.

In 1970 and 1975 Romania was hit by two devastating floods—the worst in memory—that damaged four million acres of farmland, several hundred industrial plants, and left more than 300,000 homeless. During the summer and fall of last year, lack of rain meant the Danube and other rivers flowed half their normal capacity, and the national hydroelectric system suffered.

The national program includes creating 1,400 storage lakes (there are now 100), digging 2,000 kilometers of canals and pipelines, doubling the amount of land under irrigation, constructing scores of hydroelectric stations, and doubling the amount of water available for each person, to about 500 liters a day. All this is to be done in two stages, up to the year 2005.

Officials have asked the army and Romania's people to partici-

pate in implementing this project.

In a related development, Romanian ecologists, concerned about the gradual ruin of the Danube River Delta—one of Europe's most unusual areas of bird, fish and plantlife—are taking measures to stop its further delay.

Once upon a time millions of birds nested in the million-acre Delta's reeds, and fish thrived in its clean waters. But since 1950, more than three-quarters of the Delta's 300 species of birds have

been slaughtered.

Factories and towns in West Germany, Austria, Czechoslovakia, Hungary, Yugoslavia, Romania, Bulgaria and the Soviet Union have been pouring chemicals and sewage into the no-longer "Blue Danube" as it flows 2,900 kilometers to the Delta from its source. Naturally, fish yields decreased.

The Danube Delta has one of the world's largest compact reed zones—675,000 acres. For many years they were burned, for they were considered useless and a danger to navigation. But since 1956 the reeds have been harvested in ever-greater amounts to provide raw material for a large paper factory. The annual harvest is now about 180,000 tons.

To protect the area, several laws have been passed in the past few years forbidding reed harvesting in some preserves and the hunting of several species of birds, including pelicans and egrets, which were mass-exterminated for their feathers.

A reed research center was set up at Maliuc, in the central Delta, and coordinating all economic and scientific activities is an enterprise located at Tulcea, where the Danube branches into the Delta. Corneliu Dascalu, its general manager, said the Delta has been divided into two zones. The upstream zone is for fish and reed growing, forestry exploitation and agriculture. Ever since the mid-1970s when fish farms were developed upstream, yields have increased. One of its great prizes is the sturgeon which immigrates from the Black Sea to lay roe in the Delta, a "catch" of 30 to 35 tons of caviar a year.

The downstream zone near the sea is a 100,000 acre national park, where flora and fauna are conserved intact. This zone may be expanded to 180,000 acres, Dascalu said.

SPECIAL TO WER

Irish demand tighter controls after supertanker explodes

DUBLIN—It was Ireland's worst-ever disaster. A supertanker exploded at an oil terminal in Bantry Bay in January, killing 50. In its ghastly wake, both the Irish and British called for inquiries, new rules and that the European Community run an international marine environment protection agency.

The supertanker was the French-operated Betelgeuse, which caught fire at the American Gulf Oil Terminal and blew apart. Experts agreed the pollution was not as bad as had been feared—much of the oil remained in the bow section, but the incident brought renewed controversy about the terminal. In October 1974 625,000 gallons were spilled into the bay during transshipment, in January 1975 115,000 gallons were spilled. Gulf operates the terminal as a transshipment point, bringing oil from the Middle East in supertankers, off-loading it at Bantry and then sending it to the UK and European market in smaller tankers.

Michael Spencer-Davis, an independent oil expert based in Dublin, said, "The main problem is not with the oil companies, but with the tankers. Hundreds of them are at risk today because their steel hulls are literally being eaten thin by the effects of oil over the years. A great many of them lack the 'inert gas' system required to prevent vapor exploding inside the tanks. And they face a constant risk of running aground." The Betelgeuse reportedly did not have an inert gas system.

A British government report asked for additional powers that would enable other states to intervene in nearby international waters to forestall threatened pollution by detaining substandard ships in port and even prosecuting the owners. TOM MacSWEENEY

More on Europe ...

IN THE WEST GERMAN STATE of North Rhine Westphalia, an unprecedented public opinion effort is underway. The Minister for Transport and Economics, Horst-Ludwig Riemer, sent letters to 32,000 people living near the Duesseldorf Airport, soliciting their views concerning the planned construction of a new runway there. Even before the letter was sent, numerous objections had been filed with state building authorities.

Riemer has stated that no authorization to proceed with construction will be issued until every citizen has had the opportunity to present his or her objections.

SWEDEN HAS BANNED unrestricted use of snow scooters across its wintry countryside in an effort to prevent damage to the environment. In the future, scooter drivers must stick to specially marked trails.

The law went into effect on January 1, but for economic reasons the approved routes haven't yet been sign-posted everywhere. Police are skeptical about their ability to enforce the new law, particularly in the wide open terrain in the north of Sweden.

"We are aware that the prohibition is difficult to enforce, but we believe that everything gradually will function in a satisfactory manner," said a spokesman for the National Board for Protection of the Environment.

TWO NORWEGIAN FIRMS say they have jointly developed a new process for effective disposal of sulphur dioxide.

The Flakt-Hydro process is marketed by Norsk Viftefabrikk, which jointly developed it with Norsk Hydro. It exploits the alkalinity of seawater for the absorption and neutralization of sulphur dioxide in flue gases. The gases are "scrubbed with seawater," and the polluted effluent is processed in a liquid treatment plant in which the SO² is oxidized to form harmless sulfate ions, which are returned to the sea—and which makes the process useful only to coastal companies.

Years of experimental operations with the Flakt-Hydro process installations have shown that 99 percent of the sulphur dioxide content of the gas can be removed. The installations are simple in design, operationally safe and demand minimum capital outlay and maintenance costs, the firms said.

ABOUT 400 INDUSTRIAL ENTERPRISES posing environmental hazards have been relocated outside Moscow city limits, according to the Soviet newspaper Vechernyaya Moskva.

The relocation program has gone on for several years and has been planned by the Soviet capital's Interdepartmental Scientific-Technical Council for Environmental Protection.

Nuclear Power...

A SWISS GOVERNMENT commission reported that only nuclear power could meet this country's long-term energy requirements.

The report—the result of a four-year study—did note, however, that there were social and political problems that would first have to be solved. It suggested that a vigorous information campaign be conducted.

The Commission projected that nuclear power could supply 10 percent of Switzerland's energy needs by the year 2000, double the present percentage.

The report came under fire immediately from opposition groupings. One group—that links various organizations for the protection of the environment—charged that the Commission had been heavily weighted in favor of the energy supply industry and had very little input from environmental or anti-nuclear groups.



A MINING COMPANY faces legal action after a radioactive measuring device was lost in a West Australian nickel mill and later found in a scrap metal heap in Singapore.

Western Mining Corporation will be prosecuted under Western Australia's Radiation Safety Act for the loss of the device which contained Celsium 137 and has a radioactive life of 30 years.

Hundreds of similar devices—this one measuring nickel pump density—are used in Australia, but this is the first one, it is believed, to have been lost.

THE WEST BERLIN SENATE has declared that it would like an agreement with the East Berlin government that would permit local authorities to take precautions if there were a nuclear accident in neighboring—and surrounding—East Germany.

Currently the atomic power plant at Rheinsberg—a 70-megawatt pilot project—is the only reactor in operation in East Germany less than 100 kilometers away from Berlin. A major nuclear power plant is planned at Stendal, about 90 kilometers west of Berlin, but no details are officially known as yet.

There is a small research reactor in operation in West Berlin, but there is no nuclear power plant.

French change nuclear wastes into low-risk glass blocks

PARIS—French nuclear engineers have developed a process for solidifying liquid nuclear wastes. The French claim that the process, used successfully since last summer at their plant in Marcoule, makes the disposal of nuclear wastes risk-free. ("Nothing is risk-free," said an American specialized in this field.)

The process, called vitrification, converts the wastes into blocks of boroscilicate glass, which are buried deep in mountain caverns, allowing their harmful properties to dissipate over a period of roughly 100,000 years. Volume is reduced by about 15 times. The blocks, weighing about 1500 pounds each, are encased in huge steel drums before burial. The vitrification plant at Marcoule is the first of three planned by the French government. Costing about \$120,000 each, the plants will pave the way for similar technology—which France has indicated it would sell—to be introduced in other European countries. This despite President Carter's wishes that the reprocessing of spent uranium reactor fuels be banned worldwide. Reprocessing creates plutonium, the main ingredient of atomic weapons. Plutonium is also used as fuel in fast-breeder nuclear reactors, whose development has also been proposed for banning by President Carter.

France is thought to be the only country in the world to have the technology for solidifying liquid nuclear wastes. The United States and Great Britain have long worked on the technology, but it remains in the experimental stage.

In the United States, a scientist specializing in this method of nuclear waste disposal said, "The French are one step up from us. They're already doing this on a commercial basis. We are producing large-scale cannisters but on an experimental basis."

The specialist was William F. Bonner, manager of nuclear waste process development for Batelle, which is working with the Department of Energy on a high-level waste immobilization program.

He said vitrification is a leading contender for a low-risk method of nuclear waste disposal: "The major U.S. program is in the same direction, although we are looking at crystal as well." The French system, Bonner said, is too small-scale for the U.S. to buy its equipment. But he understands it is a good system: "They feel they can contain it during processing, transport and burial. They feel the risk is very low...and I agree with them."

A majority of the French approve the development of nuclear power in their country, according to a poll conducted for the conservative daily, *Le Figaro*. When asked, "Are you for or against the development of nuclear plants in France?" 47 percent were for, 42 percent against, and 11 percent had no opinion.

The poll is significant because among European countries France has always been considered strongly opposed to nuclear energy, boasting the most vocal and demonstrative proenvironment, anti-nuclear movement on the continent. France has been the scene of numerous bloody demonstrations in recent years at nuclear sites, or at sites where construction of nuclear-power plants was underway.

GARY YERKEY

Kremlin critical of Soviet environmental protection

MOSCOW—The Kremlin has issued a decree calling for steppedup efforts to conserve natural resources and strengthen environmental protection in the Soviet Union.

It apparently reflected continuing high-level dissatisfaction with the state of environmental protection in this country, where ecological awareness generally has been slower to emerge than in Western industrial nations.

The latest Kremlin policy statement, which was published in the Communist party newspaper Pravda, was strongly critical of the party and government at all levels, and the Soviet Academy of Sciences and its sister organizations in the country's republics.

Remedial measures urged by the decree included:

 Stricter enforcement of pollution standards by the State Committee for Hydrometerology and Environmental Control, and its local branches.

• Steps by Gosstroi, the top Soviet construction organization, to modify plans for major territorial-complex development projects so that adverse environmental effects can be minimized.

 Reducing and eventually eliminating the use of peat for fuel at electric power stations in the European part of the Soviet Union.

 Greater coordination among scientific institutes and other organizations involved in environmental research.

 Expanding popular education on environmental protection in schools, films, via television and radio, and through publication of a new magazine, "Nature and Man."

German law mandates prison for some ecological crimes

MUNICH—West German Justice Minister Hans-Jochen Vogel, a Bavarian Socialist Party leader, has submitted a draft for this country's first environmental criminality law to the West German Parliament. Prospects for passage are good: The opposition Christian Democratic Union/Christian Social Union is in general agreement with the measure.

Environmental violations and directives have existed for years. Why, Vogel was asked, is a Federal law necessary now? "What is happening now is that we are combining a multitude of different directives into one penal code and closing existing gaps," he

explained.

"Naturally punishment is a final and extreme measure, Vogel said. "More important is the change in consciousness, in attitudes toward environment. Also important is control by the administration. But in the final instance-against incorrigibles who intentionally damage or destroy the environment, we are obliged to apply the instrument of punishment."

Vogel said the more serious penalties range from six months to 10 years when, for example, the crime against the environment endangered the health or the lives of a large number of people.

The Justice Minister predicted that the new penal code would be adopted and go into effect during the 1979 legislative period. WILLIAM G. MAHONEY

Environmental Legislation ...

CONSTRUCTION OF NEW FACTORIES within Seoul and to its north will be banned from April on, said Kim Jong-nan, Director General of the Industrial Estate Bureau of the Ministry of Commerce and Industry. The government plans to reduce the percentage of factories in the country's metropolitan area from about 30 percent now to 20 percent by the end of 1986.

TWO BILLS will soon be introduced in Hong Kong to tighten control over the pollution of inshore waters and streams, the Secretary for the Environment, Derek Jones, has announced.

Jones said a new water pollution control bill will limit and control the discharge of liquid effluents. Another new law, a waste disposal bill, will deal with the disposal of agricultural wastes which are one of the main causes of stream pollution in the colony.

MOTORISTS IN SOUTH KOREA will face strict penalties if their cars are found to be emitting carbon monoxide, hydrocarbons and nitric oxides above the permissable levels beginning in July this year.

Government officials said that motorists of all new cars will be asked to limit the level of carbon monoxide emission from their cars to 4.2 grams per mile. A limit of 6 grams per mile for hydrocarbon emission and 4 grams per mile for nitric oxide emission are also imposed.

Violators of these controls will face imprisonment of up to three years and fines of

up to \$30,928.

For cars that are already in use before July, there will be only carbon monoxide checks. Motorists whose cars are found to be emitting more than 7.3 grams of carbon monoxide per mile will face one year in prison.

DETERMINED TO MAKE THE IRISH more healthy, Minister for Health Charles Haughey has announced even more ruthless methods of

stopping smoking.

As reported in WER (Jan. 1, p. 5), Haughey had put strong curbs on cigarette advertising, in addition to the government warning on cigarette packs, "smoking can damage your health." He now wants another notice in large type on cigarette packs, "SMOKERS DIE YOUNGER." And he also wants power to ban the importation of magazines into Ireland which carry cigarette advertising. There has been strong opposition to the latter proposal which has been termed as censorship of publications.

Down under . . .

A HUGE SUBTERRANEAN LAKE has been found in Western Australia, where drought conditions have prevailed for the past three years.

The lake, some 210 kilometers south of the capital city of Perth, is thought to be three times as large as the capacity of the metropolitan dam, which holds 93,400 cubic meters of water.

The find was made after a deliberate search by the state's department of mines.

The water found is potable, containing as little as 200 milligrams of dissolved salts per liter.

Although the state government has warned the find is no cause for complacency, drought-weary citizens are rejoicing. The drought, the worst on record since records were begun in 1876, has resulted in severe water use restrictions.

TESTS AT THE AUSTRALIAN Coal Industry research laboratories in Sydney have resulted in a method of extracting oil from black coal by adding hydrogen.

The coal-to-oil conversion is considered a breakthrough because it recycles continuously, where prior research involved batch testing. For further information contact Mr. Patrick Hills, New South Wales Minister for Energy, Energy Authority of N.S.W., 1 Castlereagh Street, Sydney 2000, New South Wales, Australia.

"KEEP OUT" notices have become familiar to New Zealanders in the fire-conscious state forests. Except for specified picnic spots the forests have been protected from the careless campfire lighter.

But now 151 native forests are being opened to public recreation though fire lighting will be by permit. The only prohibition will be on carrying firearms.

Only forests containing public water supply catchments will be prohibited. The state Forest Service is trying to involve the public more in decisions concerning the management of state forests.

NEARLY 90 PERCENT OF THE POPULATION in Peninsular Malaysia will get tap water by 1985, Works and Public Utilities Minister Datuk Lee San Choon said. The government has already allocated \$317 million under the Third Malaysia Plan for water projects.

AN EDITORIAL in the Malaysian Forester pointed out that the rate of logging in Peninsular Malaysia exceeds 2,500 acres a day or over 922,000 acres a year based on the 1977 figures. There is a total of 17.8 million acres of forests in Peninsular Malaysia.

Australia urges car owners to convert to LPG

PERTH—Faced with dwindling oil reserves, the Australian government is mounting a campaign to encourage the conversion of vehicles to liquid petroleum gas (LPG) fueling.

A state/federal government task force will be set up to evaluate and demonstrate the use of LPG.

The Minister for National Development, Kevin Newman, announced several incentives to boost conversion in the private sector:

- any rise in the price of LPG will be forewarned five years in advance
- the road tax on LPG-driven cars will be half that of conventional cars
- increases in the cost of LPG will be limited to half the increase in the cost of gasoline
- ways of improving bulk storage facilities for LPG will be examined

The main domestic source of petroleum, Bass Strait, is due to start running out in 1980, and increased exploration in potential offshore oilfields has not yet produced a major find. Meanwhile, the price of gasoline is rising steadily. LPG costs about 9 cents less per liter than petroleum.

Newman said the conversion to LPG—costing about \$600—would be particularly applicable to fleet vehicles such as taxis, vans, and trucks. A taxi could recover the conversion expenses in fuel savings within six months or 50,000 kilometers, he said.

IANE NACZYNSKI-PHILLIPS

Coal is suggested fuel for South Africa's vehicles

JOHANNESBURG—South Africa's coal resources are four times higher than previously supposed. As a result, some scientists say it should be used to fuel motor vehicles—especially now that Iranian oil will be in short supply.

Because of the country's bright coal outlook, a strong plea has been made in the latest South Africa Journal of Science for research into coal-fired external combustion engines for motor vehicles. The writer argues that as paraffin-fired boiler engines have worked in small cars (as long as 50 years ago), the only problem to overcome now is how to heat such engines with coal. He suggests a fluidized-bed concept is probably feasible "as one of the potentially most efficient and environmentally acceptable means of burning coal yet developed."

It would make more sense than South Africa's present policy of producing gasoline from coal at its huge Sasol plant—a process which, in energy terms, requires more energy to produce petroleum from the coal feedstock than is recovered from the fuel when it is finally used.

The journal calls for research on three fronts: to design a

pulverized fuel burner to run the already available steam engine for light and heavy vehicles; to find whether a fluidized-bed system can be developed on a small scale; to find whether a liquid or solid product from the solvent refining of coal can be used in the burner and whether these products can be made commercially available at reasonably low cost. JAMES CLARKE

Plan to turn vast forest into woodchips angers Chileans

SANTIAGO—A Chilean plan to have international firms transform 118,950 hectares of virgin forest into lumber, woodchips and agricultural land is being bitterly opposed by environmentalists and an organization of the Roman Catholic Church.

Two Japanese firms conducted a four-year feasibility study of the project jointly with CORFO, the Chilean state development corporation, and then quietly pulled out of the \$65 million project late last year. The Japanese cited unsatisfactory market conditions. But a Chilean ecologist said he was told the Japanese were leery of the combination of building public pressure and increasing demands by CORFO for social capital investment, such as

So now the Chilean government plans to put the project up for international bids. It would affect about one-sixth of the island of Chiloe, just off the Chilean mainland. It has led to what many believe was the first confrontation in Chile between environmentalists and the government over an industrial project. But neither side convinced the other during a meeting organized by the Roman Catholic foundation for developing Chiloe, FUNDECHI.

One environmentalist charged that "to wipe out the woods" would result in an "ecological disaster." But that assumption was based on scant knowledge of the project since CORFO refused to divulge technical details ("There are things that just can't be made public," said CORFO's Carlos Borquez.) The project's broad outline includes a plant to produce 1.25 million tons of wood chips a year, construction of a mechanized port for exporting the chips, and creating a lumber complex with a capacity of one million inches of lumber a year.

CORFO's planned 15-year joint venture with the Japanese would have employed 2,500 people, reforested half the 118,950 logged hectares and turned the rest over for grazing and agriculture.

Borquez said CORFO didn't know of any other development project suitable for Chiloe, which has a per capita income of \$250 a year, compared with \$450 for the rest of Chile.

But FUNDECHI concluded that not only had CORFO not done an ecological study of the project, it had not made an anthropological-social study to prepare Chiloe's 120,000 residents for the abrupt changes they would undergo. CORFO responded it would have to know exactly what the project would entail before it could begin studies. NINA SERAFINO

Environmental Investments...

THE PHILIPPINE MINISTRIES of Energy and Natural Resources have agreed to establish an ice plant powered by solar energy. It will cost \$500,000 and be located in the Navotas district in Luzon. Similar solar-powered ice plants will be established in the country if the Navotas plant proves to be successful.

IN SWEDEN, funds to buy land for nature reserves have been doubled from 13 million crowns (\$3 million) last year to 25 million crowns (\$5,814,000) in this year's budget after having remained more or less static for many vears.

IN ENGLAND, Dr. John Cunningham, minister responsible for energy conservation, announced that a demonstration project, the first of its kind in the food industry, would recycle heat in a working dairy. "It is based on a templifier heat pump—the first of its kind in Europe," he said, and is expected to be in commission in the latter half of next year.

The installation will cost about £82,000 (\$162,360) and could save £30,000 to £60,000 (\$59,400 to \$118,800) a year in energy costs. It will be housed in a plastic bottling plant now being built by the Unigate dairy group at Walsall in the county of Staffordshire.

FOR THE FIRST TIME Sweden is going to check diesel engines for dangerous emissions. The National Board of Protection of the Environment was allotted 1,370,000 crowns (\$318,000) in this year's budget for equipment to test the exhaust from diesel motors. Heretofore, Swedes have concentrated their experiments on gasoline engines.

"Up to now, we have mainly used the percentage of carbon monoxide as a gauge in the automobile exhaust problem," commented Olle Aaslander, a technical expert on the state committee studying automobile exhaust. 'Therefore vehicles with diesel motors escaped because they emit a small amount of carbon monoxide in their exhaust.

"On the other hand, there undoubtedly are various cancer inducing agents in diesel smoke. The release of particles from a diesel is ten times greater than from a gasoline driven engine."

The committee is gathering facts on the whole problem of engine exhaust as the basis for laying down a workable national policy in the spring of 1980.

In Asia ...

JAPAN has set up a Traffic Pollution Control Office to be in charge of matters relating to air and noise pollution caused by traffic in the

In recent years, noise and air pollution caused by automobiles, aircraft and railways has become a serious problem. The Environment Agency has already taken a series of measures, such as the setting up of environmental quality standards and the lowering of the permissable levels of automobile noise and exhaust gases.

The new Traffic Pollution Control Office will plan, formulate and promote basic policies; coordinate measures taken by related administrative agencies; and do comprehensive surveys and research.

THE SOUTH KOREAN government is expected to drop its original plan of asking new oil refineries to install desulphurization facilities. Instead, the government will ask the refineries to provide facilities to process low-sulphur crude oil.

The Ministry of Commerce and Industry, in disclosing this decision, said the high cost of installing desulphurization facilities is discouraging local petroleum firms from building more oil refineries.

THE HUGE TIWI GEOTHERMAL POWER PLANT

was recently inaugurated by Philippine President Ferdinand Marcos. So far, 40 wells have been dug in Tiwi but only 15 will be utilized for the first two powerhouses, each generating 55 megawatts of electricity.

The Philippine Commission on Volcanology has discovered a new geothermal site in the

Manito area in Albay Province.

The Ministry of Energy projects that by 1987 geothermal power will account for 8 percent of the total power in the country.

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Japan's waterways deteriorating

TOKYO-The water quality of approximately 40 percent of Japan's rivers, lakes and seas does not meet the country's environmental control standards, and the situation is getting worse instead of better, particularly where inland waters are concerned. This is the most recent finding of the Japan Environment Agency.

One of the most polluting factors is tourism, simply because it is less organized as an industry.

Agency officials took 164,558 water samples from 10,000 locations throughout Japan.

Only 35 percent of the lakes tested between April 1, 1977 and March 31, 1978 met water quality control standards compared with 40.7 per cent in the previous testing period. In these lakes, much of the pollution came from sewage discharged by nearby hotels and other tourist facilities.

Happily, the agency failed to find any place where mercury pollutants exceeded environmental standards. However, one river in Tokyo and another in Osaka were polluted with cyanide. Two other Japanese rivers were contaminated with polychlorinated biphenyl.

Agency officials said that the survey results clearly reflected inadequate enforcement of water pollution controls by local governments, many of which seemed to be more concerned with the continuing economic recession than with pollution pre-

Asian states ask UNEP to help solve environmental problems

JAKARTA—The five-member Association of Southeast Asian Nations (ASEAN) has asked for more United Nations participation in solving environmental problems in the region.

The request was made following a recent three-day meeting of ASEAN officials attended by Dr. Mostafa K. Tolba, Executive Director of the United Nations Environment Program (UNEP), and 50 environmental experts.

Participants said specific problems of ASEAN cities were waste disposal and recycling, perennial floods and landslides caused by deforestation.

Indonesia's Minister for Developmental Control and Environment, Dr. Emil Salim, listed priorities for the Regional Environment Program: relocation of population, wildlife conservation, developing microbiological and genetic resources, evaluating the environmental impact of manufacturing, agriculture, industry and mining, monitoring ocean pollution and air quality.

Salim said cooperation in the environmental field would strengthen ASEAN if the objectives were achieved jointly and efficiently.

Several regional meetings are being planned for mid-1979, Dr. Tolba said, which would provide an opportunity for the group of 77 to discuss reconciling development with environment.

GHAFUR FADYL

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U.S. government actions overseas now require eco-reviews

WASHINGTON—Ever since passage of the National Environmental Policy Act (NEPA) in 1969, various government agencies have been at odds over whether NEPA should be applied to U.S. Government actions abroad. Agencies concerned with foreign defense and export policy, including the State and Defense Departments, traditionally maintained that it did not. Opposing them, the Environmental Protection Agency and the White House Council on Environmental Quality (CEQ) insisted on a strict interpretation of the NEPA provision that states that "all agencies of the federal government must file impact statements in advance of actions significantly affecting the quality of the human environment."

Now, after years of intragovernment wrangling, President Carter has signed an executive order that requires environmental reviews of certain major government actions that have effects outside the U.S. It represents a compromise worked out by CEQ negotiating for environmental agencies and the State Department negotiating for foreign and export policy agencies.

What government actions require environmental reviews? Those that have an exceptionally important effect on human health or the environment in foreign countries. Actions affecting "innocent bystander" countries that are not party to a U.S.-sponsored project. And actions with impacts on the global environment that belongs to the world in common. Only actions affecting the global commons will require a full environmental impact statement. The rest can be assessed by concise environmental reviews, known as environmental assessments, or by environmental studies with the affected foreign countries.

Also included under the order are all major federal actions that:

- Involve a facility that is strictly regulated or prohibited in the U.S. to protect against radioactive hazards, such as the export of nuclear reactors.
- Involve a product or facility whose principal products or whose emissions or effluents are prohibited or strictly regulated in the U.S. because their toxic effects create a serious public health risk (e.g., pesticides).
- Affect natural or ecological resources of global importance that may in the future be designated by the President or, in the case of resources protected by international agreement, the secretary of state.

Under the order, all federal agencies with activities outside the U.S. must put procedures for implementing the order into effect within eight months of the signing by President Carter on Jan. 5.

Not affected by the President's order are, among other things, disaster and relief action, intelligence activities and arms transfers, actions involving national security or which occur in the course of

Environmental Legislation . . .

BY PRESIDENTIAL DECREE, Mexico has created an Inter-Secretarial Commission on Environmental Sanitation to coordinate all major environmental improvement activities at a national level. Commission members are the secretaries of health (chairman), agriculture and water resources, human settlements and public works, patrimony and industrial development, program and budget, public education, labor, national defense, navy and fishing. The sub-secretary for Environmental Improvement, a division of the health department, and the director of the department of Mexico City, a federal district, also are permanent members.

The commission, which meets at least once monthly, is empowered to invite other officials to participate in discussions of special problems. For example, the commission's first work is with officials of Petroleos Mexicanos, the government oil monopoly, in determining how to clean up oil refineries and tankers without slowing economic progress. State governors and city officials also may be invited when their areas are under discussion.

BULGARIA'S National Assembly Commission for Environmental Protection has called for more anti-pollution measures in the country during the next two years.

Radio Sofia said that the deputies proposed a greater concentration of funds and forces for building water purification installations. Construction of 145 projects is planned and the construction of another 14 town purification stations will be continued, it said.

NORWEGIAN authorities may reduce the content of lead in gasoline and enforce stricter controls over automobile emissions.

The Ministry of Environment is considering a reduction of from 0.4 to 0.15 grams of lead per liter.

"Specific proposals aimed at reducing pollution from automobiles can be expected around the New Year," Environment Ministry spokeswoman Ragnhold Krosshavn said.

In reaction to this proposal, it was reported that the price of gasoline to consumers will increase by five ore (one cent) a liter and that oil companies will be forced to invest some 150 million kroner (\$30 million) to comply with the new regulation.

Secretary General Eiler Holtermann of the Norwegian Petroleum Institute, said that reducing the lead content of gasoline will also mean increased annual production costs of some \$12 million.

armed conflict, and export licensing except when the export of nuclear facilities is involved. In addition to including the export of nuclear reactors, the order may require environmental reviews for a small percentage (probably less than 5 percent) of the total dollar volume of exports financed by the Export-Import Bank.

The White House made it clear that the order in no way violates the sovereignty of foreign nations nor imposes U.S. environmental standards and values on other countries. "Other countries have a right to know whether U.S. activities in their countries might get them into serious health, safety, and environmental problems," states a fact sheet accompanying the order. "Furthermore, if an agency determines that the preparation of an environmental review will violate a foreign country's sovereignty in fact or appearance, the agency may modify its compliance with the environmental review and notification requirements in order to avoid diplomatic problems." Further, the fact sheet notes that "both the U.S. agency and the country can decide to proceed with environmentally damaging activities if they see good reason for doing so."

Charles Warren, chairman of the CEQ, called the order an important step toward better protection of the world's environment. And a White House spokesman said the order "will help carry out the (Carter) Administration's strong commitment to global environmental protection."

PETER PHILIPPS

Don't sell us what you ban, Central Americans tell U.S.

SAN JOSE, Costa Rica—A new Central American federation of conservation groups has sent a cable to President Carter asking the U.S. government to prohibit the exportation of products (primarily chemicals) that have been rejected for use in the United States.

The Middle American Federation of Non-Governmental Conservation Organizations (FEMAC) said it would send similar cables to the heads of other exporting countries.

The federation stated that the Third World has often been the dumping ground for unscrupulous manufacturers. Rather than lose their investment, they sell often dangerous products to the less developed countries, which do not have extensive testing facilities. The new group also asked the developed world to stop exporting vehicles which do not contain the minimum emission requirements of the country of origin.

At its founding conference last month, FEMAC members agreed to urge the banking systems of their respective countries to require ecological impact studies in connection with relevant bank loans.

The regional conference that established FEMAC was the first of its kind in Latin America, and was funded in part by the U.S. Agency for International Development. It was held in Guatemala City, but FEMAC's headquarters is in San Jose, Costa Rica, c/o P.O. Box 3089.

MURRAY SILBERMAN

Amazon forest may go to pay Brazil's debts



RIO DE JANEIRO—A reported plan, in which the government would cut down vast sections of the Amazon forest in order to pay Brazil's staggering foreign debt, is meeting strong environmental opposition here.

The plan, which was leaked to the press, calls for tendering risk contracts on vast tracts of jungle in much the same way that concessions are offered for oil exploration. The offer would be made to multinational companies who have the capital and knowhow required to market the valuable but remote rare hardwoods.

Studies based on aerial photo surveys estimate there are about 700 types of trees in the Amazon jungle, and many of them have high commercial value—perhaps billions of dollars—if an infrastructure can be built to bring them to market.

Brazil has a whopping \$40 billion foreign debt and has been running a one to two billion dollar annual trade deficit for the last few years, so the government is desperately looking for additional revenue.

The government has not officially confirmed the plan but has announced that it is considering going ahead with a smaller scale "lumber concession" plan in the Tapajos River area. Critics fear this might be a pilot project that then could be applied to the whole jungle.

The devastation of the jungle has been going on for centuries but has accelerated in the last two decades with the introduction of modern technology, introduced primarily by individual settlers.

Environmentalists fear that large-scale lumbering in the Amazon could irreparably damage the jungle in as short a time as two decades. They are launching a strong campaign against the plan and are obtaining a surprising amount of favorable support both in Brazil and abroad. Even Brazilian nationalists, who traditionally look suspiciously at environmentalists, are joining forces with them this time, partly because their ecology consciousness has been raised but also because they dislike the multinational companies that would cut down the forest.

The main argument against the plan continues to be the danger of turning the jungle into a desert and perhaps even cutting down on the world's oxygen supply. Environmentalists point out that the Amazon jungle has a unique and highly delicate ecological system which once cut down is most likely to lead to erosion and loss of the very thin layer of top soil that covers most of the jungle floor. The land left would be useless for agriculture, and it would take centuries for the rain forest to grow again.

GEORGE HAWRYLYSHYN

Forestry ...

THE AUSTRALIAN GOVERNMENT, through the Social Affairs Ministry, has contributed \$36,772 to Indonesia to help the country's reforestation program in East Nusatenggara Province. The fund will be used to buy perennial seedlings and agricultural tools for the villagers there.

A PROVINCIAL GOVERNOR in the Philippines has ordered an investigation team to look into the continued destruction of the 617,500-acre (250,000-hectare) forest in the Bukidnon district of Malaybalay Province.

Reports showed that only three of the 16 licensed loggers operating in the district have been undertaking adequate reforestation measures in their concessions. Some loggers sold their concession areas while others have been operating outside their areas. Inhabitants of the district claimed that the Pulangi River and watershed area were silting up, a result of erosion from the denuded mountains nearby.

THE THAI GOVERNMENT has approved a proposal of the Agriculture and Cooperatives Ministry to encourage the private sector to join with the government in the country's reforestation scheme.

Deputy Agriculture Minister Thamnong Singcalvanich said that numerous private firms had shown interest in replanting trees in various parts of the country. Currently, there are two government agencies, the Forestry Department and the Forest Industry Organization, responsible for the reforestation. Thailand has lost more than 10.2 million acres of forest in the northeast due to illegal logging.

BANGLADESH has the largest block of mangrove forest in the world. It covers one-eighth of the country's land area, and one-third of the population, directly or indirectly, depends upon it for their livelihood.

So, Bangladesh was a logical site for the recent five-day regional seminar on the mangrove environment. About 50 delegates from 12 Asian nations, Australia, UNESCO and FAO attended.

The results of the seminar were that Bangladesh was recommended as the site for an interdisciplinary research center for studying the ecosystem of mangrove forests, that mangrove committees be set up in each participating country and that research be coordinated for management, including the problems of pollution and depletion of fish stocks.

UNESCO offered finance and expertise.

In Latin America ...

WEST GERMANY AND BRAZIL will build a solar village in Brazil this year.

The announcement was made by Gunter Narkus, science attache of the German Embassy in Brasilia. The project will be organized jontly by the Brazilian National Research Council and the German Research Center at Julich. Construction is scheduled to start in the middle of this year, but the solar village site has not yet been selected.

The main objective of the solar village project is to provide a model or demonstrator unit so as to industrialize the production of solar collectors, now only a small-scale business in Brazil. The French have been talking about installing a solar village in northeastern Brazil for two years, but nothing has come of it. Now Germany, which recently sold Brazil a multibillion-dollar nuclear energy complex, has taken the lead with solar.

MEXICAN ASTRONOMER Arcadio Poveda says environmental contamination is seriously retarding astronomical investigations worldwide. "Optical" contamination of smoke or smog coupled with the electromagnetic noise generated by large cities is creating a need to build new observatories far away from cities, declared the director of the Astronomy Institute at the National Autonomous University of Mexico in Mexico City.

VENEZUELAN RICE IS CONTAMINATED with the insecticide dieldrin, charged Dr. Enrique Tejera, president of the First Venezuelan Congress of Conservation. He said American laboratories had analyzed rice sold on the Caracas market and found it contained 0.5 percent dieldrin.

The U.S. vetoed the purchase of Venezuelan rice some years ago, yet it is still being sold on the local market.

Venezuelan rice production is 400,000 tons annually. Together with black beans and plaintains, rice is an everyday component of the people's diet.

VENEZUELAN PRESIDENT Carlos Andres Perez has announced the creation of seven new national parks and four natural national monuments. The announcement was made at the closing of Conservation Week celebrations.

The new parks are located on the border with Guyana, Brazil, and Colombia, all along the vast trontier in mostly unexplored, uninhabited jungle territory. The presidential decree creating these new parks will provide for permanent custody and protection by the National Guard.



A soap opera and the church try to clean up Brazilian city

SAO PAULO—In a unique joining of forces, a popular nationwide TV "novela" and the Catholic Church are cooperating in a campaign to improve the air quality of Brazil's third biggest city, Belo Horizonte. Belo has a large industrial concentration with air pollution problems rivaling those of Sao Paulo which has the largest concentration of industries in the continent.

Belo's workers began to bring pressure on the government and factory owners in 1972 when, through a petition, they managed to get filters installed which dramatically cut levels of particulate matter (mainly cement dust), the city's major pollutant. Still, current dust levels are five times the acceptable maximum set by the World Health Organization. The orange clay roof tiles of the industrial district are covered with a thick layer of gray dust, and more than 50 percent of the area's residents complain of chronic respiratory ailments—asthma, allergies, bronchitis.

The 1978-79 fight for clean air is being led and organized by the Church. Ecological Masses to focus attention on the issue are celebrated and well attended. Recently priests led an Ecological Procession through the streets of Belo.

Day-to-day impetus for the movement is provided by a nightly hour-long serialized drama on national television called "Warning Signal" which highlights the conflict between poor factory workers who are subjected to unbearable levels of pollution and the rich and powerful owner of the factory where they are employed. Even though the drama runs late for workers who must be up at 5:30 a.m., it draws a regular audience of over 10 million, a record for that time slot, and nearly 10 percent of the Brazilian population. Actors starring in "Warning Signal" have traveled to Belo Horizonte for the Ecological Masses and the Procession, and their participation has been filmed by the TV network to be incorporated into the drama, providing a double reinforcement.

As the result of so much public pressure and publicity about their problem, leaders are optimistic and expect good results—strong clean air legislation, implementation and regular inspections.

LIBBIE S. MATHES

Mexico City moves on experts' suggestions to clean air

MEXICO CITY—"The air pollution situation in the Valley of Mexico City is potentially one of the most serious in the world." This was the conclusion of an international group of air quality experts after five days of on-site inspection, evaluation of scientific data and conferences with leaders of government and

industry. Invited by Mayor Carlos Hank Gonzalez to advise on the situation, the experts came from the U.S., Japan, France, Sweden, Australia and Great Britain for the unusual cooperation project sponsored by the United Nations Environment Program.

Their report said three factors cause the pollution: The city's location in a natural bowl 7,300 feet above sea level; the population growth rate, officially figured around 3.3 percent but now believed to be around 2.9 percent; and "socio-economic activities, especially the rapid growth of motor vehicle use."

Some 1.5 million vehicles are driven daily in the area, but on January 10 the Mayor banned several thousand suburban and interstate buses from the city center, ordering them to serve commuters from new bus terminals built on the city's periphery.

At the same time, Mayor Hank Gonzalez banned trucks from loading or unloading cargo within the city's business districts except from 10 p.m. to 7 a.m. In a related clean-air step, special concessions no longer will be granted to industries locating in the capital or the Valley of Mexico.

Automobiles are the chief source of air pollution, in the experts' opinion. Mexico lacks any emission standards and many vehicles are old. The experts urged that emission control standards be set and enforced on all vehicles, and that old polluting vehicles be forcibly retired.

Improvement of the city's bus and subway systems were recommendations already being realized in the mayor's programs

Because Mexico has an ample supply of natural gas, from which alcohol is produced, the panel suggested feasibility studies on using alcohol-containing fuels for motor vehicles and it suggested converting local industry to natural gas as a fuel. Relocation of existing plants in the Valley of Mexico to new sites elsewhere in Mexico was another strategy proposed.

KATHERINE HATCH

European "wise men" study energy use reduction

BRUSSELS—A panel of energy experts, headed by a member of the Club of Rome, is the long-awaited response to environmentalists' pleas that European Community authorities place more emphasis on reducing energy use and less on developing the nuclear industry.

The 12-member "panel of wise men," made up of important figures from the European scientific, academic, industrial and environmental communities, and including the 1977 Nobel-laureate in chemistry, Belgian scientist Ilya Prigogine, will receive \$100,000 from the EC Commission for work carried out in its first six months of operation. It is also expected to receive assistance from the Commission's regular staff of energy and environment experts. It has been asked to present a preliminary report no later than May 1979.

The panel will focus on practical problems associated with lowenergy consumption such as its effects on employment, leaving theory to other organizations. Panel leader Jean Saint-Geours, an

Energy Sources...

A "GUIDE TO ENERGY SPECIALISTS" is being published by the Center for International Environment Information. Designed to provide the news media with quick and easy access to authoritative sources on 15 energy technologies, it will also be available to energy professionals in industry and government.

The Guide contains the names, telephone numbers, and professional profiles of 1000 U.S. experts in solar, nuclear, gas, petroleum, coal, hydroelectric and other power systems. The experts are drawn from industry, government, environmental organizations and the scientific and academic communities.

What makes this Guide unique is that everyone listed in it has agreed—as a public service—to respond to inquiries from journalists as well as qualified energy professionals.

Cost of the Guide, which will be updated annually, is \$40. Copies may be ordered from the Center, 300 East 42nd Street, New York, N.Y. 10017.

CHINA IS BUILDING its biggest hydroengineering works on its biggest river, the Yangtze, to utilize its immense resources, the New China News Agency said.

The multi-purpose hydraulic project consists of a 2.56-kilometer-long dam and two hydroelectric power plants with a combined capacity of 2.7 million kilowatts. The power stations will supply 13.8 billion kilowatt hours of electricity a year to the country.

Other major items scheduled for construction include a flood discharge gate, shipping locks and silt discharge gates.

AT THE NORWEGIAN OIL REFINERY at Mongstad, lost energy will be recovered. The refinery will be expanded to use previously burnt-off gas, for producing propane and butane gas.

Plant expansion will cost about \$16 million and should be finished by mid-1980. The refinery is owned by Norsk Olje A/S (NOROL), Statoil and Norsk Hydro.

NOROL will market its own and Statoil's shares of the propane and butane production. NOROL already sells butane and propane to Norwegian industry and the domestic consumer market, but both gases have been imported. When the Mongstad plant goes into production, propane and butane can be exported instead.

NOROL believes the new project is important because it saves a large amount of energy once wasted. Ir addition, both gases pollute minimally and their use is constantly increasing.

In Europe ...

A GREEK TEXTILE FACTORY manager was sentenced to three months imprisonment by a Piraeus court as responsible for atmospheric pollution. Panayiotis Papafotiou, manager of the "Egeon" plant, was found guilty because he did not take measures necessary to prevent the emission of dense black smoke.

The suit was filed by the inhabitants of the area who charged that the smoke made their

lives unbearable.

The sentence was the first of its kind since Piraeus prosecutor D. Doris late last year instructed police authorities to strictly impose environmental protection regulations, and to seriously consider every complaint by inhabi-

IMPROVED WASTE PROCESSING and recycling are among Norway's main environment goals for 1979. Environment Minister Gro Harlem Brundtland, who is also deputy chairman of the ruling Labor Party, promised also to step up the fight against noise pollution in 1979: "Noise is pollution and cannot, unfortunately, be recycled for useful purposes." She said the special national commission on aircraft noise will be expanded and included in her own ministry administration. In the past, the commission worked independently of the central government.

THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO), headquartered in Geneva, has published two standards aimed at reducing food poisoning risks.

They are aimed at guiding persons conducting measurement tests for micro-organisms and therefore are of importance to public health officials, microbiological testing laboratories, to the food industry and others concerned with the problem of food poisoning in humans and

THE LARGEST COMPOSTING PLANT in Europe is being built in Czechoslovakia, by a subsidiary branch of the Prague state farm.

Pilot operation should begin this year, and annual processing capacity will ultimately be 50,000 metric tons to produce 30-35,000 tons of

organic fertilizer.

This fertilizer will be supplied primarily to state and cooperative farms around the Czech capital and to municipal parks and gardens. Enriched with mineral fertilizers, it will be sold retail under the name Pragonin.

But while the fertilizer is a valuable byproduct, improving Prague's environment is the primary reason for setting up the composting plant.

international energy consultant, said the panel would concern itself principally with designing ways to initiate a Europe-wide program of energy saving without sacrificing "adequate economic growth" or the interests of a consumer-oriented society. Until now, Europe has never had a pan-European, legally binding energy-saving program.

There was some skepticism about the final practicality of the project. "Of course, I like the idea," said Hubert David, Secretary General of the European Environmental Bureau, the proenvironment lobby at the EC. But, he said he thought it was "a long-term exercise." He added, "I expect their preliminary report in May will only say that this and that must be studied further.'

German castle owners and farmers fight for groundwater

BONN—Farmers and owners of ancient castles in Volgelsberg, 20 miles north of Frankfurt, are protesting water development plans that have already damaged their livelihoods and threaten their ancestral homes.

The Volgelsberg is a high forested area, surrounded by mixed farm, grazing, and wood land. Its rich groundwater reserves have been tapped for the past 20 years to provide water for Frankfurt and its satellites. The annual withdrawal now runs to about 45 million cubic meters a year, and work is under way that will drain off 150 million cubic meters a year by the year 2000.

It is that expansion that finally moved the Vogelsberg inhabitants to physical and legal obstruction. They have set fire to construction shacks at the sites of several experimental pumping stations. Pumping contractors now employ watch dogs to protect their facilities.

At locations longest in use, the groundwater level has been drawn down by as much as 25 feet. This has killed off extensive stands of trees, sharply lowered the productivity of agricultural land and caused major damage to buildings that have withstood wars and natural droughts for centuries.

The Vogelsbergers have not taken to suggestions that they restore the fertility of their land by installing sprinkler systems drawing water from the Rhine. This would involve an investment of over \$60 million and pumping the water a distance of 30 miles. The suggestion is particularly galling in that Frankfurt itself is only 12 miles from the Rhine and lies directly on the banks of the River Main.

Joining the protesting farmers, the Princes of Ysenburg and Buedingen, threatened with a shortage of water for breweries and porcelain works that provide their living, have engaged lawyers to institute court actions aimed at limiting the amount of water that can be taken. Their case is strengthened by an independent engineering firm's study which concludes that estimates of available water were overstated by 20 percent.

The success of their effort could force Frankfurt and, later, other cities that follow the same practice, either to catch and conserve surface water or to use water from the bigger rivers, treating it if necessary.

Many environmentalists see this as a critical step in forcing the country as a whole to clean up the rivers. This will require the construction of sewage treatment plants at every source of pollution. Without such measures, the country will be faced with a serious water shortage early in the next century, not to mention permanent damage to the environment and to many valuable man-made structures.

J.M. BRADLEY



The bloom is off Egypt's land reclamation plans

CAIRO—Egypt has launched a massive effort to reclaim and cultivate the desert and though so far results have not been impressive, the government expects to reclaim 2.8 million acres by the end of the century.

Less than 4 percent of Egypt's land is cultivable, an area that hasn't really changed for 5,000 years. However, Egypt's population has doubled in the past 25 years—to nearly 40 million—and is growing at the rate of close to a million a year. There are now a lot more people than the land can support.

Ever since the Aswan High Dam was built in the early '60s and even before, Egypt has been committed to "horizontal development," the reclamation of arid lands to supplement its traditional acreage.

Although the government claims that 900,000 acres have been reclaimed since 1952 (a little more than half for farmland, the rest for expanding settlements), some say there's been a net loss as housing has gobbled up both old farmland and new.

In opting for horizontal development, Egypt is going against the advice of the World Bank and a number of American agricultural experts. They claim there is too much economic risk since the productivity of reclaimed land will be hampered by poor soil conditions. A World Bank study completed last Spring found that reclaimed lands need up to 15 years of "capital absorption" before they can generate enough income even to cover operating expenses. In the last decade, says the Bank, the new lands have made insignificant contributions to the country's agricultural output despite substantial investment.

Rather than spend the \$2,800 it can cost to reclaim a single acre, Western experts contend Egypt would do better to concentrate on "vertical development" in lands where the infrastructure is already in place and where increases in yield can be achieved with better drainage.

Since the Aswan High Dam was built, existing drainage facilities have proved incapable of carrying away excess water. Soil has become waterlogged, and the groundwater increasingly saline.

Fish stories . . .

THE HOT, RUGGED VALLEY of the Zambesi between Zambia and Rhodesia once was as promising a commercial fishing area as Arizona.

Today seine fishermen are pulling in up to 36 tonnes of sardines a night, and a flourishing canning industry has blossomed. The cause for this transformation is the Kariba dam, completed in 1959, which created a 281-kilometerlong lake. In 1967-68, the UN Food and Agricultural Organization transported 360,000 sardine fry to Lake Kariba from Lake Tanganyika, nearly 1,000 kilometers to the north. Within eight months they had colonized the entire lake. In 1970 the Rhodesian Department of National Parks established a Fisheries Research Institute at Kariba and by 1973 it was able to give the goahead for commercial fishing.

In 1976 the annual catch was 1,000 tonnes. Now six firms are fishing the 50-square-kilometer Redcliffe Island Basin which represents but one percent of the lake area. On a good moonlit night they each haul up to 6 tonnes.

THE KAPIS SHELLFISH which provides shells for windowpanes, lampshades, and chandeliers made by cottage industries in the Philippines may soon become an endangered species.

Shellfish experts are now making studies in San Jose, Occidental Mindoro and Puerto Galera in hopes of raising the kapis artificially. Artificial fertilization by means of strip spawning has been tried but the larvae died of bacterial infections.

ALL SEAFOOD in the Channel and Brittany coastal areas of England and France will be unsafe for consumption if oil spills there continue at their present rate. This warning came from one of Britain's leading marine scientists, Dr. Alan J. Southward, in a paper delivered to the annual meeting of the British Association for the Advancement of Science, held at Bath University.

Four major spills have occurred in the area in the past eleven years. Their long-term effects were generally ignored once the immediate dangers were over, said Dr. Southward, but some oil persisted for a very long time and even at low concentrations was unacceptable in food.

"Contrary to the myth circulating among advisory committees and at some levels in the oil industry, the shores of Cornwall affected by the Torrey Canyon disaster (1967) were very slow to recover," he said. He also pointed out that areas treated with toxic dispersants had taken much longer to repopulate—ten years or more—than those left untreated.

Briefly...

PRINCIPLES OF ENVIRONMENTAL MANAGE-MENT in Developing Countries, a two-week seminar for government officials from developing countries, and representatives of international organizations, foreign aid programs and multinational corporations, June 11-22, in Concord, Massachusetts, U.S.A. Contact John Whitman, Director, International Environmental Management Institute, ERT International, Inc., 696 Virginia Road, Concord, Mass. 07142. Telephone (617) 369-8910; telex 923-335.

A SEMINAR IN ENVIRONMENTAL PLANNING will take place June 18-22 in Bergen, Norway, sponsored by the UN Economic Commission for Europe (ECE). Title of the seminar is: "Integrated Physical, Socio-Economic and Environmental Planning." All ECE member countries have been invited to send delegations.

AN INTERNATIONAL CONFERENCE on water pollution is being held in Hong Kong. Its purpose is to establish international standards in methodology for the assessment of data concerning water pollution and its control. Countries participating in the conference include: Japan, South Korea, Taiwan, the Philippines, Indonesia, India and Hong Kong.

THE INTERNATIONAL WHALING COMMISSION banned whaling off Australia's south and west coasts only days after a federal inquiry urged a total ban on whaling within Australia's 370-kilometer economic boundaries.

The whaling commission also dropped next year's sperm whale quota in the North Pacific by 59 percent, to 3,800. Only Japanese and Soviet fleets now operate in the area.

Australia's last commercial whaling station, Cheynes Beach Holdings Ltd. in Western Australia, closed down last November by order of the federal government.

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The Center is a non-profit, non-advocacy, educational organization which seeks to foster public understanding of global environmental issues. Established in 1974 by the UN Association of the USA with the support of the UN Environment Program (UNEP), the Center alone is responsible for WER's contents. A U.S. Department of Agriculture study contended that adequate drainage could increase crop yields by 50 percent. Now, a World Bank-funded project is installing tile drains throughout the country.

Egypt planners say both must be done—both horizontal and vertical development. One argues: "You can't judge reclamation from a strictly economic or agricultural point of view. We cannot continue to live on 6 million acres. We have got to move people." He predicts the new lands will eventually yield as much as the old. Since the 1967 war, he said, comparatively little was invested in reclamation, as Egypt concentrated on its military needs. Now that there's a possibility for peace, the government hopes to be able to spend \$1.4 billion on reclamation during its 1979-1983 Five Year Plan.

Portugal and UNDP fund study of Lisbon's polluted estuary

LISBON—Portuguese environmental agencies are taking the first steps toward what could eventually be a big clean-up of the Tagus River estuary at Lisbon. At present untreated industrial waste, including chemicals from two wood pulp factories, pours in mostly from the southern rim of the port. Beaches stretching 15 miles west of Lisbon are polluted with raw sewage.

The National Environment Commission is coordinating a threeyear study, begun several months ago, of Tagus River water. Samples are also being taken of acids and solids on the river bed. The aim is to determine both the quantity and type of pollution.

Portugal is paying \$600,000 toward the study and the United Nations Development Program is paying the remaining \$350,000 under an agreement signed in October.

"The river was much cleaner 20 or 25 years ago," Baltazar Morais Barroco, secretary of state for the environment, said in an interview. "The city was smaller and there were fewer industries. I can remember people fishing and swimming in the middle of Lisbon." No one swims in the Tagus now and catches are scanty for fishermen who sit atop the seawalls 10 miles outside the capital.

Morais Barroco said the estuary was "not in a dangerous situation," although the city's sewage pours untreated into the water. He said it will be at least five years before there can be significant lessening of pollution in the Tagus.

After the river study is completed, a decision must be made about what to do with the sewage. Construction of a central Lisbon treatment plant would require financing and several years. Another option would be to install pipes to carry raw sewage far out to sea.

Individual treatment facilities are foreseen for various industries on the southern bank. Financial studies are being made to determine whether the industries can themselves pay for the facilities or whether government aid will be needed.

MARIAN BLACK

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"Development pollution" debate in India

BOMBAY—If the "development pollution" debate poses cruel choices for a country like India, the problem is that much more acute when the project in question is a fertilizer plant.

A bitter controversy has been raging over the location of a 3,600-tonne a day fertilizer unit which the state-owned Fertilizer Corporation of India wanted to put up at Rewas, just south of Bombay on India's west coast. Anti-pollution bodies like the Bombay Bachav (Save Bombay) Committee waged a fierce battle against the project on the grounds that it would add to the contamination of the atmosphere in Bombay, easily the most polluted city in the country. Chembur, an industrial suburb, has already earned itself the epithet "gas Chember."

At one stage, the environmentalists looked as if they were winning when the central government ordered the state authorities—Bombay falls within Maharashtra—to shift the site. But when the Maharashtra government chose a location just 12 miles further south—at Thal-Vaishet—the central government concurred.

Thal-Vaishet is about 25 kilometers away from Bombay island on the mainland. An expert body, the National Committee on Environmental Planning and Coordination, appointed by New Delhi to go into the likely pollution caused by the plant, pointed out that there were 10,000 people living within a kilometer and a half and 73,000 within 16 of the site. It added: "Any inadvertent release of ammonia will jeopardise the population in the downwind direction."

The reason plant planners were keen on Thal-Vaishet was its proximity to the port of Bombay, as well as the off-shore gas fields known as Bombay High, from which the plant would obtain gas for its feedstock.

As for the central government, it wanted the plant built quickly—it is to cost a whopping \$600 million—so that the country could produce fertilizer to boost food output. The state authorities were anxious that the plant remain in Maharashtra because of the jobs, particularly those created by the multi-million-dollar petrochemical complexes that will follow in its wake.

Even now, the Bombay Bachav has not completely given up hope, although Thal-Vaishet looks set. A 100-year-old observatory in the vicinity will have to close down: It's one of the few remaining institutions of its kind in the world which has conducted certain tests uninterrupted for a century. More recently, the activists have raised a hue and cry about a proposal to fell hundreds of trees on the road from a makeshift port to the site. Whether their pleas will move the authorities, who want to complete the project quickly to make up for lost time, remains to be seen.

In Africa ...

THE SPHINX IS AILING. As it approaches 5,000, its neck is getting wobbly and its underpinnings

Often pelted by sand particles, its neck and chest area is severely eroded and, says Cairo's biggest paper, Al Akhbar, as a result the Sphinx's head may collapse. The paper, read by nearly all literate Egyptians, has called for a vigorous public campaign to convince the government that something must be done now to preserve one of Egypt's premier attractions.

What is needed, according to one scientist, is another injection of barium hydroxide, last administered in 1973 to strengthen the neck and chest. A wind shield has also been

suggested.

A more ominous problem for the Sphinx may be the underground water which is being absorbed by the limestone pedestal. When the water evaporates, salt crystals remain, leaving the limestone brittle. And, because the water table is not evenly distributed, the Sphinx is in danger of losing its balance.

"CALLOUS INDIFFERENCE" by international fishing fleets has led to the massive international exploitation of Namibia's \$104 million fishing industry, according to the South African Nature Foundation—a branch of the World Wildlife Fund.

Namibia's fishing industry is mainly concerned with canning. In 1962 the pilchard catch was more than 6 million tons. It is now down by 90 percent.

Up to 28 foreign fleets have in recent years fished the rich continental shelf.

The area off the west coast has the world's biggest hake fishery with a catch of over 1 million tons in 1975 and now declining.

A fishing zone of 20 kilometers is maintained by South Africa along the entire west coast, and legislation to declare a 200 nautical mile zone is now well advanced. (South Africa, because of political pressure, was forced to withdraw from the Law of the Sea conference some years ago.)

MORE THAN 700 ELEPHANTS were culled in Rhodesia this year, nearly 600 of them in the Wankie game reserve which borders Botswana.

Dr. G. Child, director of National Parks and Wildlife Management, said it was necessary because they were destroying the ecology on which thousands of other animals depended. Estimates of the elephant population in the Wankie area vary from 12,000 to 15,000. Rhodesia's wildlife authorities believe that is the maximum to be allowed.

The ivory is sold at an average of \$120 a kilo to help Rhodesia's desperate foreign currency situation.

Just a few miles away from the proposed site lies the "twin city" of New Bombay, which has been growing slowly over the past decade to accommodate Bombay's spillover. Ironically, only five years ago, a private manufacturer wanted to put up a much smaller fertilizer plant in the New Bombay area but had to give up the idea when people protested vigorously.

Bombay Bachav has been pointing out that it will be far better to locate the plant further down the Maharashtra coast, in the Konkan district, which is one of the most industrially depressed areas of the country. Once a massive plant like this one was built there, it would act as a magnet for other industries to follow.

As a last-ditch attempt, the committee is planning to take legal action against the Fertilizer Corp. for going ahead with a project which would endanger public health. If it succeeds, it will also create a precedent in India.

DARRYL D'MONTE

Rhodesia's guerilla war destroying the environment

SALISBURY—The guerilla war being waged here has affected Rhodesia's ecology, health, farming, wildlife and rural life generally.

The war, fought throughout the farming areas, makes it almost impossible to maintain firm control on the use of pesticides and to carry out regular checks and tests.

This was admitted in the Rhodesian parliament by the joint Minister of Health, Rowan Cronje, when he introduced an amended Hazardous Substances and Articles Bill.

Cronje admitted there had been some bad cases of pesticide excesses. He said vegetables in Salisbury market contained seven times the pesticide content which will be allowed in terms of the newly amended bill.

"Under present war conditions it is not easy to control matters. But we will see to it that we do the best within our limited abilities," he said.

Dr. Hamilton Ritchie told the House of Assembly, "Wash-off from the lands is now severely detrimental to river fish and everything else on the biological scale."

Tribespeople are now rarely obliged to dip cattle against tickborne fevers, and as a result the cattle are dying by the thousand. One black farmer has three emaciated cows left from a 200-strong herd two years ago.

Migrating wildlife is being confronted with more fencing, minefields, and indiscriminate shooting by both guerillas and security forces.

Mission hospitals and clinics are being forced to close down by the score, depriving many thousands of villagers of basic medical assistance, and driving doctors and nurses out of the country.

Malnutrition, the parasitic disease of bilharzia, and malaria are on the upsurge.

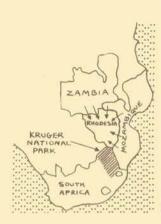
Rhodesia can no longer maintain the on-site resources needed

to stem a new tide of tse-tse fly, which had virtually been pushed out of the country in recent years. Several tse-tse fly control officers have been killed or wounded in guerilla ambushes along lonely dirt roads.

At least the amended Hazardous Substances and Articles Bill, with its stringent provisions for licensing and controlling sales of pesticides and other sprays, goes some way towards maintaining standards in the face of the war.

JOHN KELLEY

South Africa prospects for coal and oil in national park



JOHANNESBURG—Kruger National Park, one of the biggest (20,000 sq. km.) and best known of Africa's supposedly inviolate national parks, stands to lose enormous areas in the national hunt for energy.

Prospecting in the park is in direct violation of South Africa's National Parks Act of 1926. Nevertheless, the Department of Mines has condoned a year of extensive exploration, and coking coal has been found in Kruger. South Africa, although rich in coal, has only 20 years of coking (metallurgical) coal in reserve.

They are also drilling to find oil.

The Department of Agriculture is taking soil samples, which it says is routine, but there are rumors that it is contemplating growing sugar cane in the national park for the production of ethyl alcohol to mix with gasoline as Brazil does.

The most senior member of the National Parks Board (all are political appointees), P.Z.J. van Vuuren, said, "If it should be in the interests of South Africa to mine that coking coal at Kruger to meet our strategic requirements, I shall vote for it with both hands."

Also in the "national interest" has been the handing over of 3,000 sq. km. along the park's international border (it abuts Rhodesia, Mozambique and the about-to-be independent Vendaland in South Africa) to the Department of Defense which is seeking the right under the Defense Amendment Act to do what it likes in the area. The Minister of Defense, Mr. P.W. Botha, who is also Prime Minister, has assured conservationists he will not allow any unnecessary disturbance. But seeing the Department is already using the St. Lucia Estuary—a provincial game reserve—for bombing practice, conservationists are gloomy.

It is highly likely, according to Parliamentary observers, that the Government will change the National Parks Act this session to allow mineral exploitation.

JAMES CLARKE

Energy Sources...

COAL is the only raw material abundant enough to meet both long-term energy needs and the needs of the chemical industry in Europe and North America, according to a study prepared by the Secretariat of the United Nations Economic Commission for Europe (ECE).

But, it commented, massive reliance on coal will be feasible only if immediate attention is paid to:

- creating new technologies for efficient extraction and use of coal to protect the environment,
- developing international transport facilities and a coal trade infrastructure, and
- transferring the technology to developing countries so they can exploit their own coal.

Despite the high cost of oil imports, the annual growth of world coal production has remained unchanged and the share of coal compared with that of other sources of primary energy has continued to decline.

THE ELECTRICITY GENERATING AUTHORITY OF THAILAND (EGAT) will invest over \$50 million in the construction of a hydroelectric dam in the southern providence of Chum Phon.

The dam will produce 145 megawatts of electricity, or 335 million unit-hours, of energy per year. Construction of the dam will begin in 1980 and is expected to be completed by 1985. Most of the investment will come from loans and assistance from the West German reconstruction bank Kredit Anstalt Fur Wiederaufbau (K.F.W.).

ICELAND has produced large quantities of cheap, clean and safe energy from its hydroelectric and geothermal resources since World War II, and has become the envy of some not-so-lucky countries to whom power supplies come more dearly. But even through Iceland has an estimated 3,000 megawatts of hydropower still unharnessed and vast supplies of geothermal resources, with an estimated 15,000 megawatt-years of heat reserves, the problems involved in recovering this power will be complex.

Most of the geothermal power now used in Iceland involves the relatively uncomplicated technology of direct space heating. A newer, more complex method is in use at Krafla, where a high temperature natural steam power plant has been built. This generating plant has caused some concern, for it is sited very near an area of recent volcanic activity, where three lava flows and increasingly frequent seismic tremors have occurred since 1975. The danger of siting generating plants in the midst of volcanic activity threatens to be an obstacle to recovering much of Iceland's geothermal power.

Environmental Investments...

PETROLEOS DE VENEZUELA subsidiaries are investing 5 percent of their total \$175 million offshore drilling budget in environmental protection.

Twenty wildcat wells will be drilled in the next two years along Venezuela's 1,740-mile coast-line, from the Gulf of Venezuela in the west to the Orinoco Delta in the east. Petroven estimates Venezuela's continental platform to hold between 10 and 12 billion barrels of recoverable oil.

Long experience in Lake Maracaibo has contributed to making Venezuela into a Caribbean center of technology for prevention and control of oil spills. Studies have been undertaken in the ecologically delicate gulfs—breeding grounds for marine life. Two target areas, the Golfo Triste and Golfo de la Vela, are recreational areas.

Barriers to contain spilled oil, and mechanical and chemical clean-up methods are among the control systems employed by offshore drillers.

"THE SOLUTION TO ENVIRONMENTAL PROB-

LEMS doesn't always depend on money," said Jaime Hurtubia, interim director of the UNEP regional office for Latin America. "By making a rational use of existing resources, countries can make substantial changes that will avoid many environmental problems."

As examples of inexpensive steps toward environmental protection and improvement, Hurtubia cited thorough planning from village to national levels; instruction on basic health and sanitation practices, from the family unit upwards; and the inclusion of courses on ecology in schools at all levels, from primary to professional.

BANGLADESH is putting a total of \$28 million into a drainage and flood control project to protect three agricultural areas from floods. Of that amount, \$19 million is a credit from the World Bank's concessionary lending affiliate, the International Development Association.

Severe malnutrition has resulted in these areas from crop losses due to intermittent droughts and frequent floods. And the rural population there is among the poorest in Bangladesh.

All in all, 268,000 acres will be improved. And agricultural extension services, access roads, buildings, equipment and vehicles will be provided. Some 865,000 rural people will benefit from the project, which is expected to increase the annual production of foodgrains, mainly rice, by 52,000 tons and save the country about \$12 million a year. Farm incomes are expected to rise between 40 and 100 percent.

Colombia mounts major study of excessive pesticide use



BOGOTA—The Colombian government has announced a \$3.1 million program to investigate the effects of pesticides on the population's health following widespread criticism by farmers, doctors, government agronomists and local newspapers denouncing the excessive use of toxic pesticides. The program also is in response to complaints by farmers, particularly cotton growers, that insects have become immune to pesticides due to over-use.

According to the government Agriculture and Livestock Institute (ICA), Colombia consumed 17 million kilograms of pesticides last year at a cost of \$140 million. Among the 638 pesticides on the market are a variety of products based on DDT, aldrin, dieldrin and parathion. Fifty-five contain 2-4-D and 2-4-5-T, popularly known as the "orange agent," which was used to destroy forests and plantations during the Viet Nam War. Scientists consider 2-4-D 700 times more dangerous than Thalidomide. (The American Association for the Advancement of Science recommended the total banning of the herbicide in the United States after studies showed it causes birth defects.)

The Colombian government's decision to investigate the health hazards of pesticides came in the wake of studies of the cotton and rice-growing region of El Espinal in central Colombia by ICA; the Ecological Group of the University of Tolima, the country's leading environment association; and a group of 18 doctors working in the region. Though carried out separately, the studies coincided in their conclusions that El Espinal's farmers suffer from a variety of illnesses due to heavy crop spraying in the area (96 percent of the people work with pesticides).

The doctors reported a serious increase in the incidence of sexual impotency among men aged 22 to 30 coinciding with the introduction of aerial spraying six years ago. They also reported that they have had to increase the dosage of antidotes by 180 percent for patients affected by pesticides in order to achieve a response.

"Pesticides are sold in Colombia that are so dangerous and of such high toxicity that they are banned elsewhere in the world," said Dr. Luis Lamprea, a general surgeon with 15 years experience in El Espinal. "Not only are the lives and health of the farmers in danger. The entire country is affected."

For example, rice, the basis of the poor Colombian's diet, is sprayed eight times per crop. Fruit and vegetable farms adjacent to such plantations get the fall-out. Attempts to start a local grapegrowing industry in El Espinal failed due to such spraying. Italian agronomist Saverio Percipiano, who was responsible for the grape project, said that today it is impossible to grow even the native papaya on these lands. Pastureland for cattle also has been

poisoned, he said.

Because of the growing immunity of insects to pesticides, Colombia's cotton grop has diminished by 50 percent. The Cotton Growers Federation estimates that this traditional cotton-exporting nation will have to import 30,000 tons next year.

In response to the national alarm, the government Health Institute has announced the country's first scientific investigation of pesticides, with the establishment of a network of university-related laboratories in 10 regions of the country. The results will be publicized as a warning to the people and will serve as the basis for tougher government controls on pesticides, according to the institute's director, Hernando Vidales.

PENNY LERNOUX

Turkish government split over siting of nuclear plant

ISTANBUL—A serious split has occurred in the Turkish Government over construction of a nuclear power plant on Turkey's Mediterranean coast.

The Minister of Tourism, Alev Coskun, wrote an official letter to Prime Minister Bulent Ecevit, warning him that the building of such a plant near the resort areas on the coast would adversely affect the country's tourism development.

Coskun said it was essential to protect the coastline between Antalya and Mersin which, according to foreign experts, is "the least polluted part of the entire Mediterranean coast". The French explorer Jacques Cousteau visited the area recently and confirmed the experts' view.



Construction of the nuclear power plant at Akkuyu has also been criticized by fishermen's cooperatives and environmentalists.

Nevertheless, the Turkish Minister of Energy announced a contract would be awarded soon for building the plant. The chief contender in the bidding is Sweden's "Asea-Atom" in cooperation with "Metex" of Finland. The 600 megawatt plant will cost about half a billion dollars, and the Government expects its first nuclear power station to go into operation in 1984.

The Minister of Tourism stressed he does not oppose nuclear power to cope with the country's pressing energy problems, but said he thought Akkuyu was the wrong place. He suggested the creation of an inter-government committee to review the decision.

SAM COHEN

Nuclear Power...

THE KOREA ELECTRIC CO. in South Korea will receive loans totaling more than \$1.3 billion, the largest aggregate of loans ever provided for a single project in Asia, to expand its nuclear power generating capacity.

The loans consist of a \$400 million Eurodollar loan syndicated by Chase Manhattan Asia Ltd., a \$732 million loan from the U.S. Export-Import Bank, a \$97 million loan from the private export funding corporation of the United States, and a \$102 million loan guaranteed by the Export Credit Guarantee Department of Britain. The credits will be used for buying equipment and providing technical services for the construction of two nuclear units in Kori.

THE SOVIET press agency Tass has announced that the first stage of its nuclear-power reactor factory ATOMMASH is in operation.

It said that the giant assembly-line operation will produce one million kilowatt atomic power reactors and added the plant "has no equal in the world."

"For the first time in the world the producing of such reactor units will be organized on almost assembly line methods," Tass said. Located near Volgadonsk about 600 miles south of Moscow, the plant will be the symbol of Soviet intentions to push ahead with the development of nuclear power.

According to projections, it will turn out three to four million-kilowatt reactors each year by the middle of the 1980s. Eventually the assembly line will measure almost six miles in length, ending at a specially constructed port where the reactors will be loaded onto barges.

THE EUROPEAN COMMUNITIES (EC) new five-year thermonuclear fusion research program, running from January 1979 through December 1983, has been approved by the Commission and sent to the Council. It is worth 736 million European Units of Account (about \$957 million), including 208 million EUA to be contributed by the EC. The program will be carried out by EURATOM-associated laboratories in eleven European nations (the nine EC member states plus Sweden and Switzerland), plus the EC's common research facility in Ispra, Italy.

The purpose is to develop thermonuclear fusion experimentation to the point where the procedure can be successfully demonstrated. The model is the Tokomak Fusion Test Reactor at Princeton University; construction on a similar reactor will begin February in Culham, England, at an estimated cost of 184.6 million EUA under the auspices of the EC program called Joint European Torus (JET), which is funded by the EC.

Water wise ...

THE INTERNATIONAL OCEAN INSTITUTE at the Old University in Malta is organizing a training program in management and exploitation of seabed resources. The aim is to assist governments, particularly those of developing countries, to obtain the best and most authoritative information on developments in this highly complex and difficult field, to assist the training of Ocean Institute personnel, and to set up an international scholarship system.

The Institute intends to base the project in Malta. A meeting of experts recently examined the project in detail and is advising the Institute as to how it should be organized and funded. Attending were ILO and IMCO, the Red Sea Commission, the Oil Exploration Forum, and experts and observers from Belgium, Brazil, Canada, Chile, Egypt, West Germany, Holland, Kuwait, Mexico, Libya and the United States.

BANGLADESH is working on a law to cover all aspects of marine pollution. An expert from the UN's Inter-Governmental Maritime Consultative Organization has been in Dacca to assess the situation and to recommend and draft the legislation. He is also expected to recommend to the government the various international conventions relating to marine pollution which Bangladesh should accept.

The report is being prepared jointly with the Bangladesh Environment Pollution Control Department.

EGYPT'S LAKE EDCO, gradually becoming a dumping ground for industrial waste, is now the focus of a three-year Egyptian-United Nations project to monitor environmental change.

Egyptian scientists say the fresh and salt water lake, located 28 kilometers east of the city of Alexandria, currently has a low level of industrial pollution. But pollution can be expected to increase, as the city's industrial zone expands.

Scientists will also study ecological changes in the 26,000-acre lake caused by the Aswan High Dam. Lake Edco now absorbs less fresh water from the Nile River as a result of the Aswan Dam, according to Dr. A.R. Bayoumi, Director of the Institute of Oceanography and Fisheries, and will eventually receive significant amounts of drainage water from new communities to be established on reclaimed land.

Findings of the Lake Edco study will be applied to the country's three other coastal lakes, all of which contribute to Egypt's yearly fish catch.

With a \$100,000 grant from the United Nations Development Program to purchase field and laboratory equipment, the project will be conducted by the Institute of Oceanography and Fisheries.

Huge German open pit mine may be environmental boon

BONN—Work is now under way in west-central Germany on what will become the biggest open pit mine in the world. It will produce 2.5 billion tons of lignite during the next 50 to 60 years, worth around \$50 billion at current prices. It will also entail a record-breaking disruption of the local landscape, to be followed by a land restoration program which, in the end, could be worth more to the country than the value of the lignite recovered.

The area to be mined lies on the western edge of Europe's biggest lignite field, between Cologne and the German-Belgian border, with proven reserves of 55 billion tons. The new mine, known as Hambach, is being developed by the Rheinische Braun-kohlenwerke AG (Rheinbraun), which currently produces 100 million tons of lignite a year from a half-dozen smaller mines in the same field. This provides the fuel for about 16 percent of Germany's electrical power generation. The older mines will be exhausted in the next 15 to 30 years.

In the Hambach mine, six tons of earth will have to be removed for every ton of lignite recovered. Removing, storing and reusing that overburden during the next 50 years may well become a textbook case of land reclamation.

While the total area to be mined extends for 50 square kilometers, a modest start is being made in the northwest corner of the field. Here, as will be the rule throughout the mine's life, topsoil is first being removed and set aside for future use. That done, the digging begins in earnest.

It will take the excavators about five years to open up a work area on the first lignite surface. The overburden displaced in that operation and later ones will be carried some five kilometers by conveyor to a site where an artificial mountain, 168 meters high, will be built. Its completion, including covering with topsoil and planting with trees, will take about 12 years. The forest planted there will eventually replace one that will have to be cut towards the end of Hambach's useful life.

As the working area expands, more overburden will be conveyed 10 or 11 kilometers to the site of older mines reaching the end of their lives. They will be filled to the level of their original contours to reclaim some 6000 acres for agriculture or forestry. In the past, land reclaimed by Rheinbraun has shown a 20 to 25 percent improvement in productivity over what it had originally.

Inevitably in an operation of this kind, farms and villages are overrun. In the past, Rheinbraun has built a half dozen new villages to replace those it has destroyed, always with the concurrence of the public authorities and the inhabitants.

The third and major disposition of overburden will be refilling the Hambach pit itself. As the pit is enlarged, displaced overburden will be moved to the rear to refill worked-over areas. This will be a continuing process, so that by the time the last bit of lignite is removed from the exhausted mine, much of the area disrupted earlier will again be producing crops or supporting forests.

But, there obviously will be a shortage of material for refilling the Hambach pit. It will leave a hole in the ground 305 meters deep over an 21-square-kilometer area. A tunnel will be bored through solid rock below the level of the pit, to connect it with the Rhine River some 20 miles distant. This will permit it to fill within a few years, to provide a fresh water reservoir that will more than double West Germany's water storage capacity. It is expected to cost far less than would the construction of storage dams on streams. Planning for Hambach goes back to the early '60s, and has been under official review since 1972. While it entails a disruption of the landscape greater than any ever carried out in a settled community, the project is going ahead without public protests or court actions. That, in itself, is an accomplishment of historical significance.

J.M. BRADLEY

African locust threat growing



NAIROBI—East African Agriculture Ministers are appealing for more international assistance to help control the expected locust plague threatening their countries in the next few months.

Following an emergency meeting of the Desert Locust Control Organization of Eastern Africa in Nairobi, the organization's chairman, John Malecela, Tanzania's Agriculture Minister, was asked to make direct appeals to the UN Food and Agriculture Organization (FAO) and other bodies.

Spray aircraft have been posted at seven airstrips around Ethiopia's Ogaden desert area, where fighting between guerrillas and Ethopian government forces has prevented spraying and monitoring of breeding swarms of locusts. At least nine large swarms of locusts had moved into this area from Somalia in recent weeks, the Nairobi meeting was told, and after multiplying there in conditions made favorable by rain, they are expected to cross into northern Kenya early in 1979.

Many have been destroyed, but others escaped. More swarms have moved east from the western Sudan to the Red Sea coast, and control operations have begun in the area south of Port Sudan.

Malecela told the meeting that the present locust threat was no longer merely an East African problem, and it merited more international assistance.

The present threat affects a wide area of Africa and Asia, and more locust swarms are now expected to move into the Horn of Africa from Arabia between March and June. This indicates that the problem is going to continue at a crisis level for a long time.

CHARLES HARRISON

In Asia ...

THE GOVERNMENT OF BANGLADESH will soon introduce "realistic" environmental legislation, said Prof. S.H.K. Eusufzai, a member of the government's planning commission and chairman of the Bangladesh Environment Pollution Control Board.

He said the United Nations Environment Program would provide assistance.

Although the country is not highly industrialized, Dr. Eusufzai said the planning commission would introduce a provision requiring new industrial ventures or factories to get prior permission from the Environment Pollution Control Board.

The 16-member inter-ministerial pollution control board, which was set up in 1973 to coordinate environmental activities, will formulate policies for the control, prevention, and abatement of environmental pollution, he said. Four laboratories and one mobile lab (funded by a Dutch grant) will be set up to monitor air and water pollution.

A FULLY-GROWN FROG is said to consume a kilogram of insects—equivalent to its own weight—every day. This is why Indian conservationists have long suggested that exporters stop catching them in the rice-growing wetlands and set up special farms to breed them in captivity.

Maharashtra's Minister of State for Agriculture, S. S. Bondre, recently told the state assembly that the central government would soon be asked to ban the export of frogs.

The exporters claim that they are prevented from trapping frogs during the breeding season. But this is hardly convincing, since the peasants who catch them are desperately poor and will scarcely observe seasonal bans.

UNITED NATIONS ENVIRONMENT PROGRAM (UNEP) experts from Bangkok visited Dacca recently to assist the Environment Pollution Control Board of the Government of Bangladesh in its environment management program.

One UNEP mission covered the environmental pollution control area, environmental legislation, human settlement, conservation and wildlife protection problems.

The second mission conducted a study of environmental impact assessments, development and environmental legislation, and administration in the country.

The mission worked in close cooperation with the UNDP, the Dacca government and the Environment Pollution Control Board.

The mission submitted their findings to the government, and its final report is expected shortly.

Meetings ...

WORLD MARICULTURE SOCIETY annual meeting, January 22-26, in Honolulu, Hawaii. For information contact Colin Nash, Oceanic Institute, Waimanalo, Hawaii 96795.

COMMITTEE ON POPULATION AND DEMO-GRAPHY (National Academy of Sciences), open meeting, on February 15, on fertility patterns, contraception, demographic variables in developing countries. Contact Ken Hill, Committee on Population and Demography in Washington, D.C., (202) 389-6768.

"TECHNOLOGY APPROPRIATE TO UNDER-DEVELOPED COUNTRIES," International Symposium of Engineering, February 19-23, San Salvador, El Salvador. Contact Ing. Ricardo A. Navarro, Segundo Symposio de Ingenieria, Universidad Jose Simeon Canas, Apdo (01) 168, San Salvador, El Salvador, Central America.

1979 OIL SPILL CONFERENCE (Prevention, Behavior, Control, Cleanup), March 19-22, Los Angeles Bonaventure Hotel, Los Angeles, California. Contact: 1979 Oil Spill Conference Headquarters, 1629 K Street, N.W., Suite 700, Washington, D.C. 20006. Telephone (202) 296-7262.

INTERNATIONAL MATERIALS CONGRESS: Materials Aspects of World Engergy Needs, March 26-29, Sheraton Inn-International Conference Center, Reston, Virginia. Co-sponsored by the U.S. National Research Council and the National Academy of Engineering. Contact Robert Hemm, National Materials Advisory Board, (202) 389-6443.

5th WATER AND WASTE ENGINEERING for Developing Countries (WEDC) Conference, April 24-25, Loughborough, U.K. Contact Dept. of Civil Engineering, Loughborough University, Loughborough, U.K.

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Spaniards at odds over what to do about environment

MADRID—"Five ministries look after the environment, and badly," public works minister Joaquin Garrigues Walker declared at the start of a three-day conference on the Spanish environment.

In a different conflict of interests, ADELPHA—La Asociacion de Defensa Ecologica y del Patrimonio Historico-Artistico—one of Spain's more visible ecological groups, criticized conference organizers for excluding non-official groups.

The complaint was the last in a long line of charges that a counter-productive gap exists between the administration's new efforts to clean up Spain and the efforts of new ecological groups, forming a barrier rather than a common bond between them.

Keynoting the conference were calls for legislation to protect the environment—a body of legislation still conspicuous in Spain by its absence. Speakers called for laws to control noise, to classify and punish ecological and environmental offenses and to regulate effluent and exhaust.

As the conference began, a new poll showed that more Spaniards (40 percent) are concerned with traffic and pollution than with unemployment, housing, transport and teaching.

JULIE FLINT

Australian asbestos town's people to be relocated

PERTH—A mining town in Western Australia which once supplied 80 percent of the country's asbestos is to be relocated because of the health risk resulting from airborne asbestos at the present townsite.

The Western Australia government will foot the bill for moving Witenoom's 150 residents—the last remaining of a mining community that at its peak numbered 6,500. The mine operated between 1943 and 1966.

As reported in WER (September 25, 1978, p. 7), some 200 employees of the now-defunct Australian Blue Asbestos company, a subsidiary of CSR Limited, have been found to have developed asbestos-related lung diseases; of these, 45 have died.

Recently, CSR set up a \$2 million trust fund to compensate asbestosis victims. The company admitted no liability in setting up the trust, which will mete out \$2,000 per year over the next decade to victims of the diseases.

The state minister for health, Ray Young, told a meeting of townspeople that there was a small but positive health risk from the prevalence of airborne asbestos tailings and that prolonged exposure was inadvisable. It could lead to mesothelioma, a cancer of the lung, according to studies by the state public health department.

The townspeople will gradually be re-situated over the next 12 months, as town facilities are shut down.

JANE NACZYNSKI-PHILLIPS

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In This Issue

As WER embarks upon its fifth year of publication, we are proud to bring you this special issue—the first in our new format, and the first double issue on one subject: nuclear plans, policies and politics around the world.

Correspondents covering more than 50 countries wrote lengthy files based on interviews and data available from top officials. From this wealth of material, Michael Silvia, a graduate student whose specialty is nuclear energy, wrote this report. We think you will find it illuminating.

If you would like additional copies, they cost \$10 each.

Our first nuclear energy roundup, published in June 1975, found that many nations, reacting to the 1974 energy crisis, had announced plans to increase their nuclear energy capabilities.

This increased commitment caused increasing controversy. Then, it took the form of mass demonstrations, conferences, petitions and studies. Today, as you will read, opposition has become more sophisticated.

Trans-national alliances have been formed between anti-nuclear groups. The question of whether to build or expand nuclear capability, and what to do with nuclear wastes, has led to public demands that the people have a part in the decision-making. Actions taken have ranged from going to court to taking it to the people directly.

The result has been that in many nations the nuclear projections of a few years ago have had to be rethought and reduced.

Because these delays have been costly and because of the very real questions involved in nuclear power, a number of countries are looking more seriously at alternative forms of producing energy.

WER is not an advocate of any one point of view. What we want to do is provide you with the most comprehensive report now available on the state of nuclear energy around the world as of the beginning of 1979.

L.B.

= 8 JAN 1979

Nuclear policy, plans and politics: A global review by WER correspondents

No longer, it seems, can nuclear power expand free of public debate in many countries of the world. Nuclear programs have been slowed or stopped by means that have ranged from court action in West Germany to a referendum banning nuclear power in Austria. At the very least this public controversy has given countries a chance to weigh the advantages and potential hazards of nuclear power before committing themselves to it irreversibly.

The major exceptions to this trend, of course, are the one-party states where nuclear plants can be built without regard to local or national public opinion. However, for instance, as the Brazilian government has taken tentative steps towards a freer political arena, its politicians and press have begun to challenge the government's ambitious but expensive plan to buy an entire nuclear industry.



While many questions have been raised about nuclear power, what is becoming the pivotal issue that will shape the future of nuclear power is the problem of waste disposal. In Sweden and in the West German state of Hesse continued nuclear power development will hinge on whether a permanent disposal system can be developed. But the solution to waste disposal may depend less on the technological feasibility of creating a permanent dump than on public acceptance of the dump's siting. While many people can be sold on the idea of having a nuclear plant built near them, no one seems to want a nuclear waste dump in their own backyard. Test drilling on possible sites has encountered local opposition in England and the Netherlands, and the controversy caused in Egypt by a proposal to store Austrian nuclear waste there has shown that nuclear waste is one export of Western technology that the Third World doesn't want.

The nuclear power industry will continue to grow, but not as rapidly as its supporters would like, as more people around the world consider the decision to use nuclear power as too important to be left solely to governments and power companies.

In Latin America...

THE FIRST VENEZUELAN Conservation Congress convened last month in Catacas, as a highlight of the yearly Conservation Week. Congress President was Venezuela's first health minister, Dr. Enrique Tejera, 89, who held key posts as governor and minister of state during the 1940's, when Venezuela was winning its fight against epidemics. Dr. Tejera is still an outspoken champion of conservation and sanitation. His son, Enrique Tejera Paris, is head of the Environment Commission of Congress.

The agenda of the congress covered public health problems, malnutrition, and other problems including conservation vs. industrial development, urban growth, energy, education for conservation, and agricultural safety.

THE DUTCH PARLIAMENT recently ratified a delimitation treaty between the Netherlands Antilles and Venezuela regarding marine boundaries, Venezuelan Foreign Minister Simon Alberto Consalvi announced.

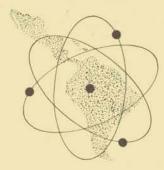
The agreement defines marine and submarine boundaries between Venezuela's Falcon state and the islands of Curacao, Aruba, and Bonaire. The accord was reached during meetings of Antillean and Venezuelan officials over the past year, but had to be ratified by the Dutch Parliament as the islands maintain their colonial status.

THE RESEARCH department of Venezuela's Environment Ministry has launched a program of fresh water fish studies, gathering some 44,000 specimens, representing 257 species, to determine those most efficient in larvae control.

A recent bout of dengue fever, locally dubbed the "Travolta," which struck widely in Caracas, is just one of the tropical diseases which the Ministry hopes to reduce through mosquito control. The Ministry wants, at the same time, to reduce the use of insecticides.

IN VENEZUELA, the first class of National Guards to specialize in environmental studies was graduated at the Ministry of Defense school in Santa Barbara, in the rural state of Barinas, a center of lumbering and stock raising. Eighty-three guardsmen of the Fuerzas Armadas de Cooperacion, which enforces environmental laws, spent six months studying ecology, environmental contamination, forestry protection, environmental legislation, administration and policies, laws and procedures.

In Latin America, Argentina is the leader



ARGENTINA is a Latin American leader in terms of atomic energy. The country has had an atomic energy study center for over a decade, and it trained those who worked in the country's first nuclear power station, Atucha, located in the province of Buenos Aires. Atucha is a natural uranium plant built by Germany and has a production potential of 340 Mw. It began operation in the early 1970s.

The country's waste disposal method is not really disposal but storage. In the wide-open area around the study center, the National Atomic Energy Commission has built a set of special pools (which actually look more like trenches) into which used radioactive rods from the plant are inserted.

Argentina plans to build another four plants before 1996. The country has ample uranium reserves, which never have been touched, in the south. It plans to put out an international tender soon on a risk contract basis for exploration and exploitation of these fields.

The Argentine government went into the nuclear export business last year when it agreed to sell nuclear technology to Peru and Bolivia.

BRAZIL'S controversial full-cycle nuclear power program is under investigation by a Brazilian senate committee. The investigation was touched off by an article in the German magazine "Der Spiegel" last September that hinted of corruption and faulty engineering in a major contract with West Germany to sell nuclear technology to Brazil.

Since the Brazilian government has removed censorship of the press and has given up its power to purge politicians, the opposition party seized on this opportunity to discredit the government. While charges of corruption were convincingly rebuffed, and the engineering problems explained, the investigation has given Brazil a chance to openly review its nuclear power program. For example, nuclear physicist Armando Turtelli testified that he did not see any need for a nuclear program at this time since the nation still has large, untouched hydroelectric reserves. The senate investigation also intends to go into the problems of worker safety, costs, environmental damage, and the danger of nuclear terrorism.

Brazil began its nuclear program by signing a contract with Westinghouse. However, American refusal to transfer nuclear technology, especially for building a reprocessing plant, led Brazil to make an agreement with West Germany which is supplying the technology, materials, and financing to build a reprocessing plant, an enrichment plant, a components industry, and eight 1,300 Mw nuclear reactors over a period lasting until 1990.

CHILE contracted with a U.S. environmental firm, Dames and Moore, in September to choose two alternative sites for the

construction of Chile's first nuclear power plant scheduled to be operational by 1987. The Comision de Energia Nuclear (COCHEN) will use the study as a basis for deciding whether to go ahead with plans for a 600 Mw plant.

Dr. Juan Grau, head of the environmental group, Instituto de Ecologia, says that it has not yet taken a position on the nuclear

plant and that he is not personally opposed to it.

COLOMBIA has only recently begun to develop a nuclear energy program. Presently, emphasis is on uranium exploration. Nuclear power plants are not expected to be developed until the next century since Colombia has cheaper energy sources in hydroelectric power and coal.

MEXICO hopes to have its first nuclear power plant completed by 1982. The Laguna Verde, Veracruz, nuclear energy plant is the only one under construction with a completion date now set for 1982 after several setbacks and work stoppages due to financial problems. Although nuclear power is expected to provide 20 percent of Mexico's energy needs by the year 2000, there is little urgency over the need for nuclear power because of the recent discoveries of large reserves of oil and natural gas.

PERUVIAN plans for nuclear power are in the preliminary stages. At the moment, there are only two well defined steps: training of personnel on a research reactor lent by Argentina and, after three years, the creation of an atomic research center. Environmentalists immediately questioned the wisdom of dismantling and transporting a reactor across the continent once it has gone critical. Argentina is also expected to construct the proposed atomic study center.

VENEZUELA—During the country's First Congress of Energy, held in December, the president of the national electricity company CADAFE, said, "Venezuelan demand for energy is growing at an impressive rate, which is a cause of concern. Venezuela has oil and hydroelectric energy, but nuclear energy, as an alternative source, is being considered"-with 1997 as the tentative start-up date. Even so, there already is public opposition to a nuclear plant.

Europeans tell governments



AUSTRIA-In an unique nation-wide referendum in November, Austrian voters voted 50.47 to 49.53 percent against the opening of Austria's first nuclear plant at Zwentendorf, near Vienna.

The Austrian government under Federal Chancellor Bruno Kreisky had called for a referendum since it felt that the issue was too controversial to be decided only by parliament. Kreisky,

More on Latin America...

FOR THE FIRST TIME IN LATIN AMERICA and the Caribbean, a country has prepared a National Environmental Plan. Venezuela's six-year plan, part of its National Development Plan, includes environmental objectives, strategies and goals developed over the past two years.

Assistance in formulating the plan was a task of the United Nations Environment Program's regional office for Latin America, which open-

ed in January, 1976, in Mexico City.

THE UN ENVIRONMENT PROGRAM'S regional office for Latin America and the UN Economic Commission for Latin America have agreed to create an Environmental Coordination Unit which will advise the full commission on environmental aspects of all matters from raw materials to economics to energy.

In another joint venture with the commission, the regional office studied alternative patterns of growth and environment in Latin America, and has recently completed a study on unconventional sources of energy for Latin

Throughout Latin America, each nation now has a single person as coordinator and international representative on environmental matters, and each country now has "environmental machinery functioning," said Jaime Hurtubia, interim director of the regional office.

One of the more ambitious projects of the office is an environmental management plan for the wider Caribbean area, which is similar in scope of the Mediterranean Action Plan.

VENEZUELA is incorporating scores of offshore islands in its claim for 200-mile territorial waters. As a result, foreign minister Alberto Consalvi said an estimated half million square kilometers of the Caribbean is Venezuelan.

The prize is offshore oil; the price, now being negotiated with near neighbors, is environmental control of marine contamination.

Isla de Aves (Bird Island), the northernmost Venezuelan possession, is a four-hectare sand spit, only three meters high and frequently under water in storms. The island is so small that it is often missed by navigators, yet its location 230 kilometers west of Dominica and 560 kilometers north of the Venezuelan mainland gives it strategic importance in the nation's maritime

As a measure of its national importance, President Carlos Andres Perez visited the island in October to inspect the construction of a naval base manned by a crew of 24. He announced that Venezuela has ordered an oceanographic vessel and will contract with local and foreign scientists to study Isla de Aves marine resources.

In Europe ...

THE IRISH have been told by their Minister for Health that they are bent on national suicide because of their attitude toward smoking.

Minister Charles Haughey has put strong curbs on cigarette advertising, now banned from national television. The tobacco companies are also faced with new restrictions on their sponsorship of major sporting activities.

The national opinion trend has shown more awareness of smoking dangers, but there has been no dramatic decrease in smoking and controversies have developed where theaters have tried to bar smoking completely.

All cigarette packs must now carry a government warning, proclaiming that "SMOK-ING CAN DAMAGE YOUR HEALTH." but it does not appear to have affected purchases seriously.

IN SPAIN, new environmental regulations passed by Madrid city hall are expected to win quick approval from the Interior Ministry. The new ordinances are designed primarily to reduce atmospheric contamination in the Spanish capital, where pollution forms what the city's four million inhabitants call "the Beret"-a thick grey cloud hanging over the city every morning. The ordinances also include penalties for polluting rivers and defacing the countryside, impose limits on noise and vibration levels and, for the first time, oblige all pollution-causing concerns to obtain permission to operate from the Department of the Environment before opening.

IRELAND'S first "Bottle Bank" has been opened in an effort to increase the recycling of glass.

The Irish Glass Bottle Company's "bank" at Blanchardstown in County Dublin consists of a specially designed container with separate compartments for clear, brown and green glass. Used jars and containers can be deposited there and each consignment will be paid for to the local community organization, which can use the money to improve local amenities.

Irish Glass Bottle already recycles 20,000 tons of used glass each year. It hopes to increase this to 30,000 tons within five years and to extend the scheme to other areas.

The pilot scheme is being supported by the Government and local authorities.

A HUNGARIAN nuclear physicist has stated that despite technical differences in construction and operation of nuclear power plants in the East and West, both areas placed equal stress on maximum safety precautions.

The comment was made by Laszlo Jeki during an interview with a Radio Budapest reporter. confident the plant opening would be approved, staked his job on it, but when the plant was voted down he staved anyway.

While the governing Social Democrats, industry and labor unions favored starting up the plant, it was opposed by the Liberal party and a broad coalition of 16 organizations known as Action against Zwentendorf that included left-wing, conservative, and environmental groups. The opponents claimed that the problem of nuclear waste disposal had not been solved and that Zwentendorf was dangerously situated in an earthquake-prone zone.

The defeat was generally attributed to apprehension on the part of the Austrian public about the ultimate safety of nuclear power. Despite an educational campaign by the Austrian utility industry, one-third of the Austrian people, according to one poll, still believed that an accident at a nuclear plant could lead to a nuclear explosion.

People living near the plant voted yes; those in the western provinces far from Zwentendorf but near nuclear power plants across the border in Switzerland, voted no. Farmers, concerned with possible degradation of the environment, voted against the plant opening while the urban vote was split.

As a result of the referendum, the Kreisky government proposed a law, expected to be unanimously approved by Parliament, that will prohibit generating electricity with nuclear power. The consortium of public utilities that was to operate the Zwentendorf plant has disbanded.

BELGIUM—Citizens of Andenne (population 23,000) dealt a severe blow to the future of nuclear energy in Belgium. Early last October they voted resoundingly against plans to build the country's sixth nuclear power plant on nearby land owned by the private electric power company Intercom. Intercom spent a reported 10 million Belgian francs (about \$312,000) in their effort to persuade the electorate to abstain. But environmental groups, principally Inter-environnement, needed only an estimated 500,000 francs to bring 75 percent of the electorate to the polls to vote the nuclear plant down.

The Andenne debate has been followed carefully by the rest of Belgium, which leads the world in the percentage of electricity produced by nuclear power (22.4 percent). The debate that led to this non-binding referendum sparked a similar debate on nuclear power in the Belgian press, which has tended to side with the antinuclear interests. Of greater significance, the Andenne referendum is expected to force a full-scale debate on nuclear power in the Belgian Parliament. Parliament promised the debate three years ago when the Government declared a moratorium on atomic plant construction. However, when the government of Leo Tindemanns fell in October, it put all concerns other than that of forming a new government on a back burner.

CZECHOSLOVAKIA—A report in late November by the Chapter 77 human rights group in Czechoslovakia of an accident in the Jaslovski Bohunice nuclear power plant has touched off a crossborder squabble involving Czechoslovak and Austrian authorities and the International Atomic Energy Agency. The Chapter 77 statement, written by an unnamed Czech nuclear scientist, reported that two workers had died in the accident in January 1976

and that the plant was closed in February 1977 following a second accident. After Austrian protests, Czechoslovakia moved through the UN's IAEA, asking them to "categorically deny" the reported accident. The IAEA said it could not positively say there had been no accidents, but it printed the Prague statement and request and added, "as far as we know, there hasn't been one."

Up till November, the Czechoslovak government was untroubled by anti-nuclear lobbies and is firmly committed to a nuclear program which by 1990 is to provide 8,000-10,000 megawatts per year, a little over a third of Czechoslovakia's energy needs. By the year 2000, half of Czechoslovakia's energy will come

from nuclear power.

Czechoslovakia had to depend on Soviet technology for its first nuclear plant, but Czechoslovak industry has been undergoing extensive restructuring to permit the production of four to five nuclear reactors a year by 1980. Ultimately 80 to 95 percent of all equipment will be of Czechoslovak manufacture. Czech industry has already supplied components to the Soviets and for Hungary's first nuclear station. It expects to supply nuclear equipment to all Comecon countries and may even export outside the bloc.

The only public outcry against Czechlovakia's nuclear energy program has come from neighboring Austria because Czech nuclear stations will ultimately ring the Czechoslovak-Austrian border. The Austrians officially proposed talks between nuclear experts of the two countries. The proposal was accepted although the talks have not yet taken place. Disclosure that nuclear waste materials are being stored not in Czechoslovakia but in the Soviet Union went far to allay popular anxiety in Austria.

DENMARK had originally planned five or six nuclear plants with the first becoming operational in 1985. However, a final decision on whether to develop nuclear power will be made by Parliament and will depend upon a long-term solution to the nuclear waste

problem.

Danish opposition to nuclear power began in 1974 after the government published a list of proposed sites for plants. Opponents formed the Organisationen til Oplysning om Atomkraft (O.O.A.) or Organization for Information on Atomic Power. The O.O.A., which has about 160 local chapters, has not rejected atomic power outright but insists that the basis for making a proper decision on nuclear power has not been found and that it is irresponsible to make a decision at the present time. The organization, which restricts itself to peaceful means of protest, has made contacts with other anti-nuclear groups abroad such as the American Clamshell Alliance.

Presently, anti-nuclear protest has focused on the Swedish nuclear plant at Barseback which is only fifteen miles from Copenhagen. Opponents have pointed out that while the United States restricts the siting of nuclear plants to areas that would have only 380,000 people within 16 miles of the plant, two million Swedes and Danes live within a radius of 30 miles of Barseback. In September, 10,000 Danes marched in protest against the Barseback plant.

FRANCE—Nuclear energy presently furnishes 12 percent of France's electricity, a 4 percent rise from 1977. The increase was

More on Europe...

THE RELATIONSHIP OF CLIMATE TO HUMAN ACTIVITY and environment will be studied by some 500 specialists from a multitude of disciplines at the first World Climate Conference this winter. "To our knowledge, this will be the first time that a meteorological conference has brought together specialists" from so many fields, said a spokesman for the World Meteorological Organization (WMO).

The 11-day conference will be convened February 12, 1979, in Geneva, and is being sponsored by WMO and a number of other UN agencies and international organizations.

Its purpose is to provide a definitive assessment of current knowledge of climate and to integrate this with information from other disciplines. Among the subjects to be discussed are the imact of climate on world food production, on energy supply and demand, on water resources, land use and other aspects of society.

PORTUGUESE officials are mounting fresh attacks on the garbage they say is threatening public health and destroying the natural beauty of cities, forests and beaches. Small-scale efforts so far have hardly dented the problem.

Municipal authorities say that, for significant improvement, a massive campaign is needed to change public attitudes, along with funds to buy modern disposal plants, expand fleets of garbage trucks, install litter baskets and hire more refuse collectors. But during the current political uncertainly and economic austerity, neither the propaganda nor the money seems likely to be forthcoming, despite the admission by some town councillors that their cities would rank fairly low on any European scale of urban cleanliness.

THE EUROPEAN COMMUNITY (EC) has rediscovered coal. In a recent status report on energy, the EC Commission calls it "the best guarantee" of long-term energy security. And it seeks to encourage coal usage by proposing a 10 Units of Account (about \$13) subsidy per ton.

An important consideration in the Commission's decision to emphasize coal was the awareness that nuclear power, once thought to be the answer to the EC's energy blues, has not been developing as originally planned. Since 1973, environmental groups throughout the ninemember EC have been forceful (and obviously successful) in their bid to halt construction of new nuclear power plants. "Last year's forecast of 90 gigawatts of installed capacity by 1985 will have to be revised downwards to around 80 gigawatts," a Commission spokesman said. (A gigawatt equals one million kilowatts.) "Current forecasts of a doubling of nuclear capacity by 1990 must now be regarded with scepticism."

Water wise . . .

NEARLY A THOUSAND TORTOISES were set free into the Ganges river in northern India after a court order saved them from ending up in cooking pots.

The tortoises had been at Allahabad railway

station where they were booked for different destinations all over India. But the wildlife warden in the area, acting on a tip, seized the amphibians under the Wildlife (Protection) Act of 1972.

Tortoises are considered sacred by many Hindus and are generally not eaten. Many live for scores of years in the safety of temple ponds.

INDIA'S Central Ground Water Board (CGWB) will survey the country's underground water potential within the next five years at a cost of

B.K. Baweja, the chief hydrogeologist, said that ground water now provides 40 percent of India's irrigation needs.

Recent research has shown that large rocky areas hold substantial amounts of ground water that can be used for development.

IN SPAIN, residents of Barcelona have been told to give infants only bottled mineral water after three consecutive readings of unusually high cyanide levels in the city's water supply.

Officials said the increase was due to a long, dry spell and effluent from industries along a tributary of the River Llobregat. They stressed that the cyanide level-0.30 milligrams per liter-would only endanger the health of an adult drinking some 200 liters daily, and announced no immediate measures.

PHILIPPINE PRESIDENT Ferdinand Marcos has declared 14 areas in the country as tourist zones and marine reserves to develop tourism and to correct ecological imbalances in the marine environment.

THE MAYOR OF ISTANBUL, Ayetekin Kotil, has announced that Turkey has obtained a \$500 million credit from the World Bank to finance a project for renewing and modernizing the old sewage system in this city.

The old sewage system is inadequate due to the growth and expansion of the city (now with a population over 4 million) and this has become one of Istanbul's major problems, the Mayor said.

due to the commissioning in 1977 in Fessenheim of two reactors which are expected to be the first of a series of 22 900-Mw nuclear reactors to be built by 1985. A second generation of nuclear plants, two of which are presently under construction, will have a capacity of 1,300 Mw. Also France's first commercial breeder reactor, the Super-Phenix, is currently under construction and will have a capacity of 1200 Mw when it goes into service in 1983. The French government hopes to reach by 1985 a nuclear output of 44,000 Mw, which will provide 25 percent of France's electricity.

However, France's ambitious nuclear power program is already two years behind schedule largely because protests by ecologists on the safety and security of nuclear installations have multiplied the procedures for plant approval. Spokesmen for the French national utility company have claimed that the delay could cause serious financial difficulties for the company in five years.

Other anti-nuclear protests have taken the form of large, sometimes violent, demonstrations. The most recent was a demonstration by 5,000 people against a proposed nuclear power plant at Plogoff last September. It ended in a violent confrontation with police when youths attacked a local office of the national utility company with Molotov cocktails.

WEST GERMANY—Protesters, politicians, and the courts have delayed Germany's 1973 energy plan that called for the expansion of nuclear power from 5 percent to 40 percent of total generating capacity by 1985. With a continuing flow of orders, the goal of 45,000 Mw should have been met easily.

Then the plan began to slip. The world-wide economic slump that followed the 1973 oil crisis cut demand for electric power. As a result, capacity in operation and on order by the end of 1975 was seen as adequate for the near term putting a stop to new orders for nuclear plants from that date to the present.

Utilities were further discouraged from placing new orders because construction can be held up any time pending approval of the next stage of work. Actual and threatened delays in this process substantially increase costs.

Still greater costs and delays have been incurred through protests by anti-nuclear groups and court actions. Massive demonstrations were staged at four nuclear plants, and in one case demonstraters injured 237 police and 80 of themselves. Some protesters have been identified as members of extreme left-wing groups, and they have no trouble mustering up to 5,000 people, drawing them from all over Europe.

Both violent and non-violent groups are now making greater use of the courts to attain their ends. By the simple expedient of filing joint action suits on grounds of environmental dangers, they can bring construction to a halt while the court reviews the case. Court action has delayed work on the ten plants ordered in 1974 by close to two years on the average.

Politicians, citing safety, the environment and employment for coal miners, have also slowed the nuclear program. For example, the Economic Minister of North Rhine Westphalia announced last year that no construction authorizations would be issued until a suitable permanent disposal facility was established. If the Minister's ruling stands, it would be at least 13 years before Germany's most power-hungry state would have a new nuclear plant.

Opinion surveys, however, reveal that there is no widespread opposition to the peaceful use of nuclear power. In elections last October, an environmentalist party in Hesse campaigned to "Ban the Atom" and took less than one percent of the vote. Labor unions strongly support nuclear energy because of the job opportunities. Workers have seen their jobs threatened or eliminated as power plant work is delayed or stopped.

With no new domestic orders received since 1975, Kraftwerk Union, the leading German firm in nuclear energy technology, makes no secret of the fact that it is in serious financial trouble even though it has orders for plants from abroad.

GREAT BRITAIN's nuclear power stations presently account for 14 percent of the country's electricity supply, most still generated from nine Magnox reactors built during the first stage of the government nuclear program announced in 1955. Britain hopes to increase the percentage of nuclear-generated electricity to 20 percent in the 1980's with the completion of three gas-cooled reactors.

Opposition to nuclear power was slow to start in Britain. Although it has grown considerably over the past four years, so far it has not fired the public imagination as the Campaign for Nuclear Disarmament in the 1950s did. The nuclear industry can use public money for literature, public relations, and films. Some opponents have gone nearly bankrupt trying to match the scientific and legal expertise the nuclear industry is able to command.

Anti-nuclear activists come from a wide range of organizations, but they are predominantly from environmental groups with Friends of the Earth and the Conservation Society taking lead roles. Protests generally take the form of political lobbying, public meetings, and an occasional large-scale rally. Links are stronger with anti-nuclear groups in the Commonwealth countries than with European groups partly because of the language barrier and partly because of the British groups' insistence on peaceful methods.

Nuclear opponents suffered a defeat when Parliament voted 220-80 to expand the Windscale reprocessing plant, but opponents say this is 80 more votes than they would have received four years ago, and they believe theirs is a growing cause.

An issue that could ignite greater public opposition is the question of nuclear waste disposal. The United Kingdom Atomic Energy Authority (UKAEA) is searching for prospective sites and finding difficulties. Of three formal applications made to County Councils for experimental rock drilling within their areas, two



In Africa...

IN SOUTH AFRICA an average 23 percent of agricultural production is lost as a direct result of adverse weather (S.A. Journal of Science, Vol. 74/11, pg 436). Loss of income in 1975/76 was estimated at R616 million (\$710 million). Most of the loss was due to drought and hail.

KENYA is to build a Wildlife and Fisheries College at Naivasha, 50 miles from Nairobi, with finance from the World Bank. It will train rangers, wardens and other personnel for service in game and fisheries departments of Kenya and other African countries. The college will cost about \$800,000.

SOUTH AFRICA's first independent "homeland," the Transkei, was set up to be an agricultural land, but its natural environment works against it, as does its poverty.

Although some estimate the Transkei should be producing three million tons of maize annually, it grows only 100,000 tons. This is partly due to a lack of draft animals and agricultural machinery. But another factor is that the southeastern coastal territory is extremely hilly, and even if equipment were available for plowing, the soil is so fragile it would quickly be pulverized and wash down the hillsides.

EAST AFRICAN countries have agreed to step up even further their efforts to counter the greatest threat of a large-scale locust invasion of this region in the last 20 years (*WER*, Sept. 11, p.4).

Aid from many international sources, including the U.S., Britain, and the UN Food and Agriculture Organization (FAO) already totals several million dollars. Adefris Bellehu, Director-General of the Desert Locust Control Organization of Eastern Africa, said the swarms had continued to increase because of heavy rain. Cloudy conditions had made it difficult to locate them from the air, and as remote sensing via satellites.

The biggest breeding area, extending over deep and almost inaccessible gorges of Ethiopia's Blue Nile valley, covered thousands of square miles.

In northern Somalia, the main breeding area covered 370 square miles, containing billions on immature locusts.

Experts said one swarm had recently skirted the Arabian Sea from the Horn of Africa to India in four days. This showed the extent of the threat to a wide area of Africa and Asia.

Noise pollution...

IN THE WEST, EASTERN RELIGIONS are thought of as quiet and meditative, but in India religious celebrations can be deafeningly noisy.

To honor good Lord Rama who slew the evil demon Ravana, religious Hindus bang drums, sing songs through loudspeakers, and declaim plays in street theaters—often well into the night.

"Despite my respect for the religious activites of individual faiths," wrote one citizen in the Indian Express, "I feel that (they) do not have a right to foist 10 sleepless nights on citizens who can do with less noise."

But he is unlikely to get much help from the government, which is unwilling to go against 3000 years of religious fervor by passing noise prevention, or even reduction, laws.

"Unlike other forms of attack on human beings, noise, the invisible enemy, is not always punishable by law," said Dr. S. Kameswaran of the Madras Medical College. But he did suggest a partial solution: "The noise nuisance can be minimized considerably if trees are planted on either side of the road and around industries and educational institutions." He said it has been found that trees can diminish noise levels by 8 to 10 decibels.

JOHANNESBURG (population 1.5 million), one of the noisiest cities in the world, is about to ban Sunday afternoon lawn mowing. But South Africa's biggest city is at a loss to solve the problem of traffic noise in its relatively narrow, canyon-like streets where the ambient noise level during the day is 80—and rising by 1 decibel a year.

STRICT NOISE STANDARDS for motorcycles have been made law in the European Communities (EC). The standards, applicable in full throughout the nine countries of the EC by October 1, 1980, are part of a series of anti-noise regulations now being developed by the EC Commission. They include standards for some industrial equipment, such as jackhammers, air compressors, generators and others, as well as for subsonic aircraft.

Motorcycle manufacturers will be required to affix to their products a certificate showing that they passed the sound-level test. Otherwise, the products may not be sold within the EC.

The new law stipulates that motorcycle noise emissions not exceed 86 decibels for engines over 500 cubic centimeters. For smaller engines, standards range from 78 to 85 decibels.

have been turned down. The only permission granted so far is by Caithness in Scotland, where the Dounreay nuclear reactor is sited and where many people work for the UKAEA. Although the UKAEA program is only at the experimental stage, those objecting think permission to drill would give an opening for later use.

GREECE—The government is giving top priority to nuclear power as a means of meeting the country's increasing electric energy demands. The Ministry of Industry and Energy has already given the Public Power Corporation a green light to establish the first 600 Mw nuclear station expected to be operational by 1986.

The government's nuclear power policy quickly encountered political and environmental opposition. Leftist opposition deputies termed establishment of a nuclear plant a "dangerous and expensive" solution and argued that the country should concentrate on the development of domestic deposits of lignite and off-shore oil.

An organization calling itself the Environmental Protection Group openly denounced the government's nuclear policy claiming that it is guided by multinational corporations that wish to sell nuclear reactors to Greece. The group called upon all Greek scientists to oppose the government's plan.

Reaction also came from the inhabitants of Karystos, a town on the Aegean island of Euboea and a possible nuclear installation site. They held a series of rallies declaring their intention to block construction of what they termed a "death station."

IRELAND is virtually certain to get its first nuclear power station now that the Minister of Energy, Desmond O'Malley, recommended its construction to the government. While a final decision has yet to be announced, the 600 Mw plant will be located at Carnsore Point, County Wexford.

This recommendation is the first official reaction by the government to the large anti-nuclear protest at the site of the Carnsore station last September.

While opposition to the nuclear plant has been growing, and most people would like to see a public inquiry into the project, the general belief is that a nuclear station is necessary to meet the country's energy requirements.

The opposition movement began under the auspices of the Irish section of Friends of the Earth and crystallized in the September protest at Carnsore. Though widespread and well-publicized, the protesters will find it very difficult to stop the nuclear program if the government decides to go ahead.

ITALY—Bargaining by local politicians has seriously constrained the development of nuclear power in Italy. While Parliamentarians generally agree on the urgent need to build new power plants, local politicians of the same parties procrastinate to appease their constituencies. They want economic aid from the central government in return for permission to build a power plant. For the next plant on the building list, near Montalto di Castro in central Italy, the local authorities got 30 billion lire (\$3.6 million) to build up the local economy in return for the con-

cession of a nuclear plant site. A bill is being prepared that would deny electricity inputs to any of the 20 Italian regions if its population votes against the siting of a nuclear or large-scale conventional power plant.

In 1975 the Italian government prepared a plan that envisaged 20 nuclear plants with a capacity of 1,000 Mw each. However, the next two years were spent in revising the plan which now calls for only 6,000 Mw of nuclear capacity by 1985. This goal is already one year behind schedule.

THE NETHERLANDS has not decided whether to embark on a large-scale nuclear program. Extension of the Netherlands present 500 Mw nuclear power capacity has been delayed by the development of large natural gas reserves and a growing opposition to nuclear power.

The process of reaching a decision on nuclear power will include a public debate starting this year, which will be prepared and led by a neutral guiding group and will include industrialists, scientists, politicians, labor unions, and national and local anti-

nuclear groups.

The growth of anti-nuclear feeling among Dutch citizens was made apparent by the recent controversy over proposed nuclear waste disposal sites. When the government announced that subterranean salt layers in two northeastern provinces were deemed acceptable for storing nuclear waste, a wave of protest spread over the area and in response the central government postponed test drilling at the sites.

Organized opposition to nuclear energy is coordinated by the National Energy Committee with some 30 local groups around the country. The committee includes environmentalists, scientists, and two small left-wing parties. The Labor Party has observer

status.

Dutch groups have forged links with the anti-nuclear movements in other countries. Some 15,000 Dutch took part in a massive demonstration at the Kalkor fast-breeder reactor in Germany in 1977. Another international protest (German, British, and Dutch) was a demonstration last March against enlarging the URENCO enrichment plant at Almelo in the Netherlands.

NORWAY—After two years of study, a government-appointed committee that was set up to study the security and safety risks involved in nuclear power voted 18 to 3 that the risks "are within the limits of what is acceptable." It will be up to other committees to study the social, economic and political consequences of introducing nuclear power. No final decision on developing nuclear power in Norway can be expected until well into the 1980s.

POLAND—Because of Poland's large coal and lignite reserves, the production of nuclear power has a lower priority than the development of more conventional energy sources. Poland plans to start its first atomic power project in the years 1984-1985 and expects by 1990 to have a nuclear capacity of 5,000 Mw. Poland will use Soviet-made reactors.

Forestry...

THAILAND'S Royal Forest Department has decided to cut down the present logging business by half to preserve the country's forests.

Director-General Thanom Premrasmi said there are some 500 logging concessions given by the Agriculture Ministry at present. A total of 250,000 cubic meters of teak and some three million cubic meters of other species of wood have been produced annually from the concessions.

No more forestry concessions will be given in the future and the current concessions will not be renewed when they expire. "In cases where the present concessionaires violate the concession agreement, the Ministry of Agriculture will immediately revoke the concession," Thanom said. The Ministry has already revoked the licenses of four concessionaires this year.

MAHARASHTRA STATE in western India has instructed its forest department to adopt villages so the villagers can help save forests. The first to be chosen is Shedung in a hilly district not far off the west coast. With just 200 people, it is chronically poor and the forest range officer has been helping them get loans to plant and tend trees.

THE MALAYSIAN GOVERNMENT is finding ways to minimize the opening up of new lands and increase the rate of reafforestation activities, said Paul Leong, Minister for Primary Industries. The present rate is too slow, he stated, and the reafforestation program in the country is not in line with correct principles of forest management. Of an average of one million acres of forest timbered every year, only 12.5 percent are reforested.

CHINA is building a "green great wall' extending 5,000 kilometers to protect farmland in the north of the country from sandstorms and soil erosion.

The New China News Agency said afforested shelter belts would cover 530,000 hectares. Once the "green great wall" is completed by 1985, over 13 million hectares of farmland and pasture land would be protected, the Agency said.

Waste water treatment...

IN WEST GERMANY, the task of cleaning up the Rhine River continues to make good progress despite the growth of population and industry in its drainage area. Between 1975 and 1977, the number of communities in the area without some kind of sewage treatment plant decreased from 16.9 to 2.4 percent, while the number with biological treatment plants increased from 52.3 to 65.5 percent at a cost of DM 4.2 billion (\$2.2 billion) to government bodies alone. By 1985, with the completion of plans already approved, the waste water and sewage of 90 percent of the population will be treated biologically.

Industry's contribution to this effort is no less impressive. To cite just one example, the chemical firm Bayer AG has invested DM 1 billion (\$531 million) in water purification facilities at five plants on the Rhine or its tributaries during the past 10 years.

THE CITY OF SEOUL, KOREA, plans to build two sewage treatment stations to filter wastes from factories in the Kuro-dong and Ttuksom industrial districts.

There are 207 plants in Kuro-dong which discharge some 50,000 tons of waste water daily into the Anyangchon Stream. Ttuksom has 430 plants discharging an estimated 84,000 tons of waste water daily into the Han River.

City officials said construction of the new stations will start late next year and will be financed by the more than 600 plants in the two industrial zones. Construction is expected to be completed by 1980. The Kuro-dong project will cost \$8.25 million while the Ttuksom project will cost \$12.37 million.

A MAJOR IRISH WATERWAY, Cork Harbor, has gotten a lengthy (five years) and weighty (17 volumes) clean bill of health after a pollution study.

The Cork Harbor Pollution Report says that, despite heavy industrial development of the area, the harbor could bear an even greater load of industrial waste and effluent. And, it says, there are no health hazards for boating, bathing and recreation. But the study team recommended a control policy for future development of the harbor. This would require that all waste from the planned major industrial center, Ringaskiddy, be piped out near the harbor mouth.

SPAIN—Anti-nuclear protests that took two lives early last year are starting up again in Northern Spain where angry Basques are attempting to block the first deliveries of radioactive material to a nuclear plant at Lemoniz near the coastal city of Bilbao.

The Lemoniz plant, now in its sixth year of construction, is scheduled to open in approximately two months time. However, anti-nuclear campaigners who claim that the plant will harm both themselves and the environment have vowed to paralyze all activity at the plant through protest inside and outside Parliament.

The first trouble at Lemoniz surfaced in March last year when Basque separatist guerrillas attempted to capitalize on a huge anti-Lemoniz protest by trying to blow up the plant with a bomb attack that killed two workers and injured a dozen others but failed to damage the two unfueled Westinghouse reactors.

After several quiet months, opposition erupted again when Basque deputy Francisco Letamendia presented in Parliament a motion to halt all nuclear construction in the Basque provinces. The motion was drawn up by the Basque Anti-Nuclear Committee which, playing heavily on radiation fears, launched last January a newspaper called "Ez, Ez, Ez" (No, No, No). If the Committee fails to paralyze Lemoniz by citizen protest and parliamentary debate, they are confident of succeeding with a program of civil disobedience; they will urge supporters not to pay their electricity bills.

At least half of the 15 other nuclear plants in construction or on the drawing boards are reported to be encountering problems with the local population. Only three plants are operational so far. Still the Spanish government hopes to supply 15 percent of Spain's energy needs by nuclear power by 1987.

SWEDEN—Drills are burrowing deep into Sweden's bedrock in search of a graveyard for final storage of dangerous nuclear waste. What the geologists find could determine the future of nuclear power in this country and the shape of its energy policies for decades ahead.

For more than two years, Swedes have been debating the politically inflamed issue of nuclear power. The debate exploded into white heat in late September and early October, and the fallout was too much for the first non-socialist government in 44 years. It collapsed.

As matters stand, six nuclear reactors out of a planned 13—a program laid down by Parliament in 1975 and intended to fill 40 percent of Sweden's electricity needs by 1985—are now operating. The six furnish approximately 20 percent of all electricity in Sweden. Another two plants stand ready to be activated. The question of whether to authorize loading the reactors finally forced the Falldin government into a crisis situation.

Former Prime Minister Thorbjorn Falldin and his Center Party were locked into a firm anti-nuclear stand. To rule, the Center had to form a coalition government with the Moderates and the Liberals, both pro-nuclear, and repeated compromises were essential.

The first compromise was a law requiring power companies to produce contracts for the reprocessing of nuclear fuel and to show how and where radioactive waste could be handled and stored in a "completely safe" way—something not yet accom-

plished anywhere. Only after the government is satisfied these tough conditions have been met will permission be granted to load any new reactors.

At least three possible waste disposal sites are being examined. Tests will be made to a depth of 500 meters over areas one kilometer square. If the tests show that the granite is stable and without cracks through which radioactivity could seep, then the government will give the go-ahead to start up the two plants.

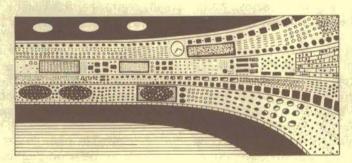
Falldin's coalition government finally fell over the issue of alloting funds for continued construction of reactor number 11, now little more than a hole in the ground. The Center Party proposed putting the issue to a national referendum. Neither the Moderates nor the Liberals were prepared to go along with a plebescite at this stage.

The new minority government formed by the Liberal Party alone under the premiership of Ola Ullsten declared when it took office that it favored an energy policy "which can receive broad backing in Parliament and among the Swedish people."

SWITZERLAND—Citizens, accustomed to direct democracy, have been moving to obtain a greater say in decisions to locate and build nuclear power stations.

In the Canton of Schaffhausen voters gave overwhelming approval (17,108 to 7, 128) to an initiative which calls for an amendment to its Constitution: Plans for nuclear power, recycling installations, and storage of wastes within the Canton or bordering the Canton must be submitted to direct referendum. This means that in the future any decision on nuclear power will be decided by direct vote, not by the Cantonal Parliament.

A similar situation exists in the Canton of Neuchatel. There an initiative, similar to that of Schaffhausen, had been declared unacceptable by the Cantonal Parliament. However, a federal court ruled against the Parliament. Therefore, in the near future, the voters of Neuchatel will vote on the initiative and are expected to approve it.



USSR—Moscow has given a "definite da" to full nuclear power development, not only as an energy source but as a source of hard currency from reactor export sales. While some debate exists on the need for safeguards in power plant construction, an antinuclear movement does not seem to exist in the USSR. Outside factors may be influential in increasing Soviet nuclear plant safety features, such as in plants bound for export. And, domestically, industrial fishing interests called attention to the need for adequate cooling facilities at Novovoronezh, the world's largest

Waste recycling...

IN VENEZUELA, Caracas' Metropolitan Institute of Garbage Collection, on instructions from President Carlos Andres Perez, is acquiring a waste food processing plant to produce pig food, according to a Ministry of Environment report.

The Institute has been commissioned to promote proper feeding for pigs throughout the country, although most pork production is centered around Caracas, as a measure to prevent contamination risks.

THE HONG KONG Productivity Center will hold a "waste recycling week" next March to promote general awareness of pollution control and resource recovery through various recycling techniques.

The Center's Industrial Development Division Manager, David Au, said a survey is now being conducted to see if Hong Kong factories are currently active in waste recycling. He believes that waste recycling is done on a limited basis in the colony because of the lack of know-how in the collection, treatment and conversion of the different types of industrial wases such as plastic, automotive, ferrous and wood into useful material.

The Center has already started an environmental control unit which provides services on internal environment protection including proper ventilation or air conditioning within the factory premises.

EAST GERMANY'S official news agency, ADN, has stressed the importance of industrial recycling as a major raw material source and declared that great efforts were being made to increase the share of secondary raw material in industrial production.

ADN reported that 75 percent of raw material used by the East German steel industry was scrap metal; between 60 and 70 percent of bottles and glass jars were made from recycled glass; the paper industry was using waste paper for 43 percent of its raw material; and the textile industry also used 10 percent secondary raw materials.

The agency pointed to rising raw material prices in the world market, the complicated prospecting and exploitation of primary raw material resources, and noted that about 70 million tons of reusable materials were available in East Germany each year.

Pollution control...

CHINA has announced tough new measures to control industrial pollution. The Taching oil-field, one of the nation's four leading industrial concerns, was singled out as having caused serious pollution.

China recently sent an 18-man delegation of environmental specialists to study Japanese

pollution prevention facilities.

Pollution problems began to receive attention in the country in 1972 when a Chinese delegation attended the United Nations conference on the human environment in Stockholm. After the conference, the Environmental Protection Office of the State Council was set up in Peking and a campaign to prevent "the three wastes" of water, gas and rubbish was launched. However, this failed to overcome the widespread feeling that industrial pollution was inevitable and that anti-pollution measures were harmful to increased production.

The new tough governmental directive said that all enterprises which do not bring environmental pollution well under control before the end of 1982 will be closed until this is done.

CHINA will import industrial pollution control equipment from Japan to ensure that a big television tube factory to be built in Hsienyang, Shensi Province, is safe for public health.

The anti-pollution equipment that China will get are a factory drain treating system from Ebara-Infilco Co. and an electrostatic precipitator dust collector from Japan Electrostatic Precipitator K.K.

THE GOVERNMENT OF HONG KONG will soon consider a series of proposals for staffing and equipment for monitoring environmental pollution.

It is estimated that about \$4.26 million would have to be provided for the initial setting up of a monitoring system.

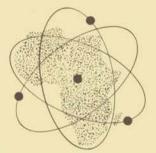
THE SOUTH KOREAN government has decided to ask the country's three oil refineries to gradually install facilities to remove pollutants from the discharge of their plants' chimneys.

Ministry of Energy and Resources officials said the move is aimed at more effective control of air pollution. The three refineries have already been ordered to install desulphurization facilities beginning in 1981. However, officials said that desulphurization facilities alone cannot prevent pollutants such as nitrogen oxide, carbon monoxide, hydrocarbons, and other harmful chemicals from being discharged into the atmosphere.

nuclear power station operating at 2,455 Mw.

The Russians expect to have 60 percent of their electrical needs served by nuclear power by the year 2000. So far, only 2 percent of the electrical system has been converted to nuclear power. Nuclear plant construction is heavily underway with the development of the factory complex ATOMMASH at Volgadonsk which will produce nuclear power plants at the rate of three to four a year. Soviet nuclear plant complexes have already been sold to Finland and Libya with possible sales to Iraq and Cuba projected.

The Soviets have 26 nuclear plants and seem satisfied with their safety record: 37 agencies must approve a plant before it can operate. Soviet scientists do admit, however, that equipment failures have taken place resulting in fatalities.



Most African countries oppose nuclear power

"There is strong popular opposition in most African countries to the use of nuclear power. The maintenance of a nuclear-free zone in Africa has strong appeal to the educated public in these countries," commented a Kenyan sociologist.

Kenya, Uganda, Tanzania, Somalia, Ethiopia, Rwanda, Burundi, Zaire, Central African Republic, Seychelles and Mauritius have no plans to develop nuclear energy. South of the Sahara, South Africa is the only country where nuclear power generation is regarded as a possibility.

The reasons for this virtually pan-African policy are the high cost, the need for highly sophisticated technology, the limited demand for electric power and, in many countries, the availability of other power sources, such as hydro-power.

EGYPT—With United States approval, Egypt will begin construction of a 600 Mw nuclear power plant, the first of at least six such facilities Egypt hopes to have by the year 2000. This first plant, at Sidi Kreer near Alexandria, is to be designed and built by Westinghouse. A contract is ready for signature but final approval has been delayed by President Carter's decision to review all of America's existing nuclear agreements. Egyptian planners and American officials expect final approval to come soon enabling the station to be in operation by 1985.

While the development of nuclear power has not encountered opposition, disposal of nuclear waste has. Last summer, when it became known that Egypt was considering a plan to store Austria's nuclear waste, a number of scientists, doctors and lawyers came forward to declare their strong opposition to the use of the desert as a nuclear dump for foreign countries.

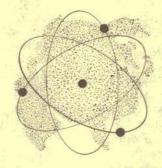
While the recent Austrian referendum has made the proposed dump a dead issue, the controversy over it is a sign of the growing environmental awareness in Egyptian professional circles. **SOUTH AFRICA'S** nuclear energy program is in some doubt at the moment, even though its first nuclear power reactor is due for completion in 1982. It now seems likely that nuclear power will be delayed for many years, and some officials predict that South Africa may never use nuclear power.

In 1976, the government announced that a French consortium was to construct the country's first nuclear power station, a two-reactor station called Koeberg, 28 kilometers north of Capetown. The announcement met with little environmental opposition and even today there is no sign of an organized anti-nuclear lobby in South Africa.

Koeberg has been criticized by the press and by economists who say that a country with such abundant coal reserves should not have to spend from R1500 million to R2000 million (\$1728 to \$2304 million) on a nuclear plant.

The criticisms are more frequent now that South Africa is confronted with the fact that America will not supply enriched uranium and has been forced to go into the enriching business itself. Even if South Africa is forced to use her own enriched uranium, it is highly unlikely to need more than 345 tons per year up to 1990, which leaves large quantities available for export.

Asia moves ahead on nuclear power plans



INDIA—While there is some opposition in India resulting from environmental concerns over the use of atomic energy, it is not a major barrier to the continuation of government efforts to expand the use of nuclear power plants. The atomic weapon test in 1974, in fact, generated a tremendous swell of pride in India and that helped dampen further opposition to nuclear energy development.

Nuclear power still accounts for only 2.5 percent of the country's total power generation in 1979 even though India has spent more than \$2 billion on its nuclear power projects. The share of nuclear power is expected to increase to 4 percent in 1984 and 7 percent in 1991. India's most recent nuclear power plans lay emphasis on fast-breeder reactors.

The projected capacity of nuclear power in 1980 is 2,700 Mw. However, it looks as if by 1979 India will only have 800 Mw of nuclear power under the present construction schedule. The reasons generally cited for these delays are the diffusion of available resources among too many projects, the absence of support from a suitably developed industrial infrastructure, and dependence on foreign collaboration. India's refusal to accept international safeguards for its nuclear facilities has made it almost impossible for India to obtain nuclear hardware.

Alternative energy...

IN INDIA, Bharat Heavy Electricals Limited, a public sector plant, is working on a "three-inone" total energy project, sponsored by the Department of Science and Technology. Solar radiation will be used to run a thermal power plant; the piped exhaust of this plant will run a cold storage plant, and the rejected heat from the cold storage plant will be used to raise the temperature in the digester of a bio-gas plant.

IN AUSTRALIA solar energy will be tapped to link the frail telecommunications network of four remote islands in Torres Strait, Queensland. The \$750,000 project involves mounting solar panels near installed telephones on the islands Moa, Yam, Yorke, and Saibai. The panels will generate power to enable radio telephone messages to be beamed to the main-island system.

The islands are as much as 70 kilometers apart. The distance has, in the past, caused radio messages to fade out, but aligned aerials will be installed to transmit the radio signals. The federally-run Telecom will engineer the project.

Only limited radio communication between the islands has been achieved till now, using high-frequency radio.

A TWO-DAY SYMPOSIUM ON TIDAL WAVES in South Korea was held recently at the Korea Institute of Science and Technology under the auspices of the Korea Ocean Research and Development Institute.

The symposium, the first of its kind held in the country, was designed to evaluate its tidal power potential and to determine the priority of sites in line with the government's recent announcement to develop tidal power generation. Some 16 specialists from France, Canada, the United States and Switzerland together with 100 local scientists and industrialists attended the conference.

EGYPT has ruled out the use of nuclear explosives to dig a 76 kilometer canal linking the Mediterranean Sea with a planned hydroelectric power station in the Western Desert.

Minister of Electric Power and Energy, Moustapha Kamal Sabry said the decision was taken to protect the environment and prevent radioactive contamination.

When the project is completed, water from the Mediterranean will be carried to the power station which, planners predict, will produce electric energy equivalent to ten times that of the Aswan High Dam. The Dam last year produced more than 7 billion kwh of electricity.

In Asia...

AN ENVIRONMENTAL IMPACT assessment will shortly be carried out in Isabela, Leyte, in the Philippines to determine whether a copper smelter will be built there, according to Industry Minister Vicente Paterno.

After the assessment, residents in nearby Isabela will be briefed and asked if they want the smelter. Last year, the people of San Juan, Batangas, defeated the Philippine Associated Smelting and Refining Corporation's plans to locate a smelter there.

THE PHILIPPINE National Pollution Control Commission (NPCC) will soon ask all local governments to review and revise their existing ordinances against noise pollution.

Deputy Minister of NPCC, Hipolito Talavera, said most of the anti-noise ordinances were passed 10 to 20 years ago and were limited to coverage of noise violations committed near hospitals only. To expand coverage of the ordinance, schools, churches and courts will be included.

CALCUTTA is reported to be sitting on oil. The eastern regional office of the Oil and Natural Gas Commission has arrived at the conclusion that the capital of West Bengal state and its neighboring areas are situated on what it calls "gravity high," which is linked with structures usually found to contain oil.

THE SOUTH KOREAN government is now pursuing the construction of power plants fueled by waste energy as a means of saving the limited energy resources in the country, Ministry of Energy and Resources officials said.

Officials said that waste energy stemming trom the central heating boilers at big apartment complexes or industrial estates could be harnessed by transforming the waste heat into electricity. The Yoido apartment complex with more than 8,000 households is the initial target of the proposed power plant construction scheme.

THE PHILIPPINE Ministry of Natural Resources (MNR) has stepped up the processing of fish-pond lease agreements in order to produce more fish for the country.

MNR Assistant Minister Joselito Janolo said the Ministry will develop swamplands into fishponds in areas where the ecology will not be affected. At present, 2,000 fishpond owners have applied for some 40,000 hectares of swampland and many have already been approved.

IRAN'S nuclear power program is a victim of the recent turmoil in that country. In order to divert resources to Iran's troubled agricultural sector and to pay higher wages demanded by workers, the Shah has been forced to drop or cut down his more grandiose development schemes. Iran had originally planned to have 24 reactors but now will make do with the four currently under construction. Two of the plants are being built by West Germany and the other two by France.

This change of plans could deal a severe blow to the German company Kraftwerk Union which, faced with a sluggish domestic market, was depending on foreign reactor sales to keep it afloat.

ISRAEL, which presently has no nuclear energy, plans to have by the year 2000 twice as much nuclear energy as any other country presently has—if existing plans are implemented. Israeli authorities envision 40-60 percent of its power being delivered by nuclear plants by the year 2000. Israel's energy vulnerability led to this projection.

The Israeli government has been attempting to purchase two 960 Mw reactors from the United States for its first nuclear power installation. The matter has been in limbo for several years because Israel refuses to comply with Washington's insistence that the U.S. have the right as a condition of sale to inspect Israel's other nuclear installations.

Feelers have gone out to other countries, and there have been suggestions that Israel build its own nuclear-power reactor.

The only opposition to nuclear power in Israel has come from residents of Ashkelon and Ashod on the southern Mediterranean coast, for the first nuclear power plant may be built between those two cities. Opposition has been based on the fear of contamination if such a plant is hit during wartime. Although Israeli environmentalists have not objected to nuclear power as such, they have suggested that alternate sites be found in the northern Negev desert so as to leave the coast open for recreation and other uses.

JAPAN—Not long ago, the odds were heavily in favor of Japan's environmental and local residents' groups succeeding in the prevention of further large-scale expansion of nuclear power stations in the countryside.

Now the Ministry of International Trade and Industry (MITI) and the electric power companies involved are much more comfortable with their problems with ecologists and local residents, particularly the latter. By making generous contributions to those opposing nuclear plants, MITI officials have cleared the way for the start-up of four new commercial nuclear plants over the next two months. These stations will have a combined capacity of 3,899 Mw.

Although there have been angry denials in Japanese government circles and by executives of the power companies, reports persist that considerable amounts of cash and other rewards of a generous nature have been distributed to local officials and prominent townspeople to win their support.

In addition, both MITI and the private electric companies are heavily investing in the infrastructures of the communities where nuclear complexes are located. Japanese environmentalists deeply resent this turn of events. The Japanese now operate 16 nuclear power plants with a total capacity of 9,560 Mw, and they plan to have a capacity of 33,000 Mw by 1985.

KUWAIT received bids in June of 1977 from Germany, Italy, Great Britain and France for a 40-50 Mw nuclear power station and desalinization plant designed for training, not only for Kuwait but also for other countries in the region.

MALAYSIA sent engineers to India in 1971 for training in nuclear power technology. A research reactor, which was planned to be completed by 1979, has been delayed by 18 months because of a siting change.

IN PAKISTAN, the government, the political parties, and non-governmental groups are unanimously in support of the need for nuclear facilities especially in the light of arch-rival India's nuclear program. Outside of this concern for national security, the limited supply of fossil fuel and hydroelectric power has forced Pakistan to turn to nuclear power.

Pakistan's first nuclear power plant of 137 Mw capacity became operational in 1972 and now supplies 30 percent of Karachi's electricity. A 600 Mw plant is now being built on the banks of the Indus River near Chashma, which is expected to be operational by 1983. The country is planning for one more nuclear power plant by 1990 followed by a much faster rate of installation.

Pakistan signed an agreement with France in 1976 for a reprocessing plant. However, after much pressure from the United States and because of instability in Pakistan, the sale by France was cancelled a few weeks ago.

PHILIPPINES—In 1971, President Ferdinand Marcos approved a plan to build a 600 Mw nuclear plant which is scheduled to start commercial operation in 1982. Ten more plants on at least three sites with a combined capacity of 8,900 Mw are planned by the year 2000.

SOUTH KOREA'S first nuclear power plant became operational in 1977 with a capacity of 587 Mw. By the mid-1980s South Korea expects to have eight nuclear plants that will supply 31.7 percent of Korea's electrical needs.

By the end of 1979, South Korea will import a pilot plant for refining uranium, fuel fabrication, and waste reprocessing. With such technology, South Korea will be able to develop nuclear fuel without foreign technical assistance. In January of 1976, France under U.S. pressure cancelled the sale of a reprocessing plant to South Korea.

TAIWAN'S first nuclear power plant started operation in 1977, and two more plants are expected to go into service by the early 1980s. Presently, 9.3 percent of Taiwan's electrical needs are filled by nuclear; by 1985 nuclear energy is expected to supply a third of the total power used on the island.

Taiwan has a 40 Mw Canadian research reactor (an improved

More on Asia...

THE PHILIPPINE Ministry of Energy announced that the first geothermal power unit in Tiwi, Albay, will be operational by the end of 1978. It will have a capacity of 55 megawatts. The second Tiwi plant will go onstream May 1979, while Tiwi plants 3 and 4 are expected to be finished by November 1979 and February 1980 respectively. Cost of the four plants is \$124 million. The monthly energy capability of the four plants will reach 360 million kilowatt hours by 1981, the Ministry said.

THE CHINA National Committee on "Man and the Biosphere" which was set up in September held its first meeting in Peking recently. Over 40 people, including members of the National Committee and representatives from concerned departments, attended. Plans for Chinese participation in the program as well as the Committee's work plans were discussed and drawn up.

The "Man and the Biosphere" program is an international scientific cooperation project of the U.N. Educational, Scientific and Cultural Organization (UNESCO). Its main task is to study ways of rationally exploiting, utilizing and protecting the resources of the biosphere and the impact of man's activities on natural resources and the natural environment.

THE PHILIPPINE Ministry of Energy has approved a budget of \$135,135 for the installation of solar water heaters in hotels, restaurants, hospitals and sports clubs. This allocation is only part of a \$1.35 million capital outlay for research and development by the Non-Conventional Energy Sources Department. Establishments applying for funding will be selected based on their capability to convert their water heaters from conventional to solar heaters.

THE MANILA MEDICAL SOCIETY (MMS) in the Philippines has launched a pioneering refuse recycling project in four districts in Manila. The MMS has lined up a series of seminars on recycling for village leaders. The seminar will make an overview of the solid waste problem in Manila, ecological recycling models, motivation materials preparation for villages, composting designs and methods, tools for effective administration of solid waste management and ways to tap resources.

Briefly ...

IN ICELAND, siting considerations for hydroelectric generating plants are receiving public attention. At a convention of Icelandic environmentalists, Sigurdur Thorarinsson, a noted geologist, presented a study of 270 waterfalls, ranking them into three categories—those which should remain inviolate, those deserving of protection, and those requiring further consideration. At the same convention, hot and warm springs, mineral springs, and similar phenomena were considered, and it was agreed that most require at least some degree of protection from human interference.

THE LAST WORKING WHALING STATION in Australia closed down operations last month, having taken six less than its seasonal quota of 561 sperm whales.

The closing, ordered in August by the federal government during an inquiry into whaling, ends a hundred-year tradition of whaling at Albany, in the southern part of Western Australia. There, whales were hunted by American whaling fleets in the mid-1800s and later, briefly, by Norwegian whalers. The last whalers in Australia, Cheynes Beach Holdings Ltd., began in 1950 with a quota of 50 humpback whales.

The 555 sperm whales caught this season (which began in March), produced between 3,300 and 4,400 tons of sperm oil. Sperm oil is in short supply world-wide at a time when new uses are being found for it: to lubricate car engines and watches, add gloss to cosmetics, soften leathers, as a soap and rust-proofer. However, since the '60s, synthetics and vegetable-derived oils such as that from the jojoba bean have been increasingly used in place of sperm oil.

The closure won't save the sperm whale from the hunt in Antarctic waters for Japanese and Russian factory ships and catchers are allowed, under International Whaling Commission rules, to work in the Antarctic.

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version of the reactor which aided India's development of a nuclear device), and it has built a small reprocessing plant. It will not be used, however, because the United States has withheld approval of its operation.

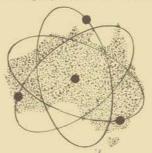
There have been few indications of any serious opposition to Taiwan's nuclear power program. The general feeling appears to be that the development of atomic power plants is essential for the island's continued economic progress.

THAILAND—Although government plans call for the development of 600 Mw of nuclear capacity over a seven-year period, no construction has taken place.

TURKEY is planning to build its first nuclear energy station, a 600 Mw plant, in Akkuyu on the country's Mediterranean coast. The Akkuyu project is well received by most people since the shortage of electricity is reflected in daily power cuts.

However, there is opposition from the inhabitants of Akkuyu and from leftist intellectuals and labor union leaders. Leftists have succeeded in leading residents of Turkey's Mediterranean coast to protest the proposed plant through demonstrations and similar non-violent means.

The opponents' main argument is that Turkey has a rich hydroelectric potential which can be developed at a lower cost than nuclear energy. A nuclear power plant would also bind Turkey to foreign powers for technology, fuel, and finance.



Nuclear wastes cause scandal in Australia

The issue of nuclear waste disposal created a scandal last fall when a Cabinet document was leaked to the press which suggested that atomic waste left over from British nuclear testing in the 1950s and buried at Maralinga, 1200 kilometers from Adelaide, was possibly recoverable and a target for terrorists. Of 20 kilograms of waste buried at the site, a half-kilogram of plutonium is in recoverable form.

The furor increased recently when it was learned that it was buried, not under 800 tons of rubble, but in cannisters less than a meter below the ground, and that maps showing the location were given a low security classification and possibly seen by hundreds since their publication in 1968.

Although the British government has agreed to accept the return of the plutonium, it ignored Australia's request for a decision on its recovery by November 7. No response was made until the 22nd—and that, unofficially. It is expected the plutonium will be transported by road to a port and then shipped to Britain to minimize physical and political risks.

Australia has no nuclear plants although one is planned for