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JPRS Report

Environmental Issues

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JPRS-TEN-91-020 *27 December 1991*

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Developing Nations Urged To Avoid Japan's Environmental Mistakes

OW0110133091 Tokyo KYODO in English 1009 GMT 1 Oct 91

[Text] Kumamoto, Oct. 1 (KYODO)—Kyushu University Professor Masazumi Harada on Tuesday urged nongovernmental organizations (NGOs) from five developing nations to avoid the environmental mistakes amid Japan's pursuit of economic prosperity.

Harada, an authority on the so-called Minamata disease, told an international meeting of NGO representatives from the Philippines, Brazil, Kenya, Malaysia, and Bangladesh that "developing countries wishing to catch up with Japan should learn from the experiences of Japan which had to pay a high price (for industrial pollution)."

An estimated 500 representatives of some 30 NGOs were on hand for the Kyushu International Environment NGO Conference.

Luis Carlos Pinage, executive director of the Rain Forest Foundation in Brazil, said greater attention must be given to the relationship between the poverty gripping the Third World and environmental destruction stemming from unchecked industrial development efforts.

Pinage, who has been trying to rescue Brazilian rain forests from development-related plunder, blamed such poverty chiefly on environmentally devastating industrial development.

The conferees adopted a resolution calling for the island of Kyushu to become a center for NGOs to exchange information on environmental protection and possible cooperative measures.

Active Role Seen for Japan in 'Environment-Friendly' Global Aid

OW1110135791 Tokyo KYODO in English 1228 GMT 11 Oct 91

[Text] Tokyo, Oct. 11 KYODO—Global aid which is environment-friendly is the key to putting Japan's "passive diplomacy" into action, Kazuo Aichi, Director General of the Environment Agency, said Friday.

Speaking at an international symposium on environmental and economic concerns in a Tokyo hotel, Aichi said considering the country's professed peace efforts, contributing to the global environment is the most suitable field to pursue.

Former Prime Minister Noboru Takeshita said he will host an international meeting in Tokyo next spring to discuss financial assistance to developing countries for environmental conservation.

Former British Prime Minister Margaret Thatcher, former World Bank President Robert McNamara, and former U.S. Federal Reserve Chairman Paul Volcker are among those scheduled to attend the meeting, Takeshita said.

Takeshita is a special adviser to the U.N. Conference on the Environment and Development (UNCED), known as the "earth summit," scheduled for next June 1-12 in Rio de Janeiro.

He said Japan must be more forthcoming in offering economic aid to developing nations, as the United States did in offering it to Japan and Western Europe after World War II.

"The United States did what they should have done, as the country which enjoyed the largest trade surplus in the world at that time," he said.

He said the U.S. assistance to Japan in those days helped it attain its current prosperity, and Japan, as the country enjoying the largest trade surplus now, should do likewise.

South Africa's Statement on Antarctic Protocol

MB0810140491 Johannesburg SAPA in English 1253 GMT 8 Oct 91

[SAPA PR Wire Service: "Media Release by Mr. Louis Pienaar, MP, minister of environment affairs" issued by South African Communication Service on 8 October]

[Text] Media Release by Mr. Louis Pienaar, MP, minister of environment affairs

Protocol on the Protection of the Environment of Antarctica

South Africa is one of 12 countries which established the Antarctic Treaty in Washington in 1959 and is at present the only African country which is a member of the treaty. It thus gives me great pleasure to announce that an international agreement, supplementary to the Antarctic Treaty entailing far-reaching measures for the protection of the Antarctic environment, was cosigned by South Africa in Madrid, Spain, at the end of last week. South Africa, together with 38 treaty countries, thus binds itself to a protocol on the protection of the Antarctic environment.

By signing this significant agreement, the treaty countries committed themselves to the comprehensive protection of the Antarctic environment, its dependent and associated ecosystems. In compliance with the protocol, Antarctica is designated as a nature reserve, devoted to peace and science. An important stipulation of the protocol is that any activity pertaining to mineral resources, except for scientific research, is expressly forbidden. After entering into force, no amendments to the protocol will be allowed for the first fifty (50) years.

Consensus on the content of the protocol was reached after three special consultative meetings during the past eleven months, attended by the 39 Antarctic Treaty

countries. The first meeting was held in Vina del Mar, Chile, and the final two in Madrid, Spain.

Mr. Naude Steyn, chief director of the Department of Foreign Affairs, and leader of the South African delegation, signed the protocol on behalf of the RSA [Republic of South Africa].

Issued by the minister of national education and of environment affairs, Cape Town

Date: 8 October 1991

Media enquiries: Niel du Bois - tel (012) 310-3658

Conference on Human Rights, Environment Opens in Sydney

BK1210071091 Melbourne Radio Australia in English 0500 GMT 12 Oct 91

[Text] Delegates from around the world have gathered in Sydney for a conference focusing on the links between human rights and the environment. After being opened by Australia's Minister for Aboriginal Affairs, Robert Tickner, the conference will examine the global threat to a safe and healthy environment. John Thompson reports.

[Begin Thompson recording] Lawyers, activists, academics, and environmentalists from around the world will examine the latest United Nations report on human rights and the environment. They will be looking at the relationship between human rights—like the right to life, health, and property—and environmental protection. The conference will make recommendations to the UN and the heads of government summit on the environment to be held in Brazil next year. [end recording]

World Bank Admits Past Role in Creating Environmental Problems

BK1410063191 Bangkok BANGKOK POST in English 14 Oct 91 pp 1,2

[Text] The World Bank, admitting its past policies have contributed to ecological damage, has pledged to focus on environmental factors in development projects to correct the situation.

Bank officials yesterday countered environmentalists' criticism of the agency by saying it has continued to make significant progress in integrating environmental concerns into its operations, lending and research.

Acknowledging a wide perception of the agency as partly creating environmental problems, the director of the bank's environment department, Mohamed Al-Ashry, said with its new policy directions the bank will become "part of the solution."

"Yes, the bank has been part of the problem in the past, but I do not believe that it on purpose went out to destroy the ecology of the world," he told a briefing session on its 1991 Environment Progress Report.

The official said in committing past environmental mistakes the World Bank merely followed the trends in the 1950s and 1960s, in which industrialised and developing countries alike had chosen to postpone investment in environmental improvements.

Environmental problems resulting from development projects, he argues, were unknown then and discovered only in the last two decades.

"I do not think that the bank has practised anything different from other countries," he said.

Now all countries have learned that they cannot afford to ignore environmental components or the costs for ecological degradation would be much greater than if they invest now.

Defending the agency, Mr. Al-Ashry said the World Bank should not be judged by its record on environmental issues alone.

In recent years the bank has made considerable improvements in environmental and natural resources management and in setting out in a whole new direction on the issue.

"I just really hope that the bank would be viewed in terms of the present and the future, not just the past."

The director said the World Bank, with its new emphasis, could contribute to development efforts with intellectual leadership in the areas of methodology for evaluation and measurement of progress.

In fiscal year 1991, the bank's lending to projects with environmental components increased from the previous year's US$404 million to US$1.6 billion.

About 40 percent of all 229 projects approved by the World Bank in 1991 had environmental or energy efficiency components, he said.

These varied from transport, energy production, forestry and agriculture to pollution prevention in industry and spread to all regions.

"That indicates the importance and diversity among different regions in terms of natural resource needs, specific environmental issues associated with them, and the kinds of responses needed."

Mr. Al-Ashry said that with several newly-adopted programmes under way the bank is moving towards incorporating environmental assessments in the formation of policy and action plans for financing projects.

One of the bank's major initiatives is the launching of the Global Environment Facility (GEF), which supports projects in developing countries by tackling four international environmental concerns.

They are depletion of the ozone layer, global warming in relation to energy development, biodiversity, and protection of international waters.

The GEF, established last November, has an initial funding of about US$1.5 billion.

The agency last year also adopted a new policy under which it will not finance commercial logging in unspoiled tropical forests.

With debate on whether or not this can be conducted in a sustainable way, the bank does not want to be engaged in such projects, he said.

The new policy is based on the Operational Directive on Environmental Assessment—the newly-developed guidelines for environment assessment required for all projects that may have a negative impact on the environment.

The World Bank also considers outside pressure from NGO [nongovernmental organizations] committees, member countries and shareholders.

In fact, on the particular issue of the controversial Pak Mun Dam project, input from NGOs was very helpful in highlighting the possible environmental impact of the project, he said.

He maintains that the project is a good example of how the bank's environment assessment works to minimise environmental damage.

For example, the height of the dam was lowered from the initial 112 metres to 108 metres above sea level as a result of these assessments.

On the bank's decision to postpone consideration of loans for the project, Mr. Al-Ashry denied it had pulled out.

The agency's executive will wait until late October or early November before making a decision so staff can present more information.

When a good policy in place, [as published] the bank will have to focus on its implementation and how to tackle issues involved.

REGIONAL AFFAIRS

International African Game Park Envisaged

92WN0032A Cape Town THE ARGUS in English 11 Sep 91 p 11

[Article by James Clarke: "SA-to-Kenya Game Park in the Pipeline"]

[Text] Johannesburg—The first steps towards forming an international game park stretching from South Africa to Kenya have already been made, says Dr. Perez Olindo, former executive director of Kenya's National Parks.

Dr. Olindo, who arrived in South Africa to open the time-share Bakubung Lodge and Hotel in the Pilanesberg National Park, is an international consultant in the field of sustainable development.

In an interview in Pretoria, Dr. Olindo, 53, said he had been having extensive talks in Mozambique on that country's plan to develop "a second Kruger Park" alongside the existing one.

He has also been paying frequent visits to Botswana, Zimbabwe and Zambia as well as two visits to South Africa.

I asked Dr. Olindo whether it was feasible to establish an international park stretching from South Africa to Kenya incorporating not just wildlife but traditional rural human activities.

He said not only was it feasible but "the network is already forming" for such a park.

"The fact that I am here is an indication of what is happening. Being here is part of the opening-up of these lines of communication."

Dr. Olindo is travelling with his wife Kate who is with the UN Environmental Project in Nairobi.

Four Southern African Countries Form Cartel To Market Ivory

MB0710160691 Johannesburg SABC Network in English 1100 GMT 7 Oct 91

[Text] Four southern African countries have formed a regional cartel to market ivory, following the international ban on the trade by many first world countries. The four countries are Botswana, Malawi, Zambia and Zimbabwe. A senior official of the Zambian Department of Tourism said in an interview in Lusaka that an ivory auction would be held in the Botswana capital Gaborone on a day to be announced shortly. South Africa and Namibia have been invited to join the cartel.

ANGOLA

UNITA Says MPLA Officials Killing Elephants, Stealing Ivory

MB0910140091 (Clandestine) Voice of Resistance of the Black Cockerel in Portuguese to Southern and Central Africa 0500 GMT 9 Oct 91

[Text] Elephants have been indiscriminately killed in Quissama Park over the last few days. Reliable sources say Popular Movement for the Liberation of Angola-Labor Party, MPLA-PT, officials are involved, adding they use the Cabo Ledo airstrip to move the ivory.

Those sources also report that an Angolan Air Force aircraft brings food supplies to the poachers every Wednesday and Thursday and flies back with the ivory. The crew is made up of presidential guard members. Those sources do not know what happens to the ivory.

The southern border with Namibia is beset with a similar problem, but [words indistinct] sold in the neighboring Republic of Namibia.

DJIBOUTI

National Environment Report Drafted in Preparation for UNCED

92WN0013A Djibouti LA NATION DE DJIBOUTI in French 22 Aug 91 p 2

[Text] Under the authority of the prime minister, who is responsible for [the portofolios of] the Plan and Regional Development Policy, the National Environmental Committee has just published a national report on the environment.

The document was drafted in preparation for the United Nations Conference on the Environment and Development (UNCED 1992) that will be held in Rio de Janeiro from 1 to 12 June 1992.

Organized around six topics dealing, in particular, with development and its environmental effects, the report represents our country's contribution to the great environmental conference.

The Republic of Djibouti wants to become fully involved in the long-term process of defining, implementing, and assessing an effective environmental policy.

The document does not aim to explicitly define the content of future policy: However, it is a initial, fundamental step and the manifestation of resolute involvement in the process.

MOZAMBIQUE

Deputy Agriculture Minister on Continuing Threat of Desertification

MB1010204491 Maputo Radio Mozambique Network in Portuguese 1400 GMT 10 Oct 91

[Text] Deputy Agriculture Minister Paulo Zucula said in Maputo today that more than half of our country's arid and semiarid regions face the risk of desertification because of agricultural activity.

He said that if we continue with the present agricultural activity, half of our natural dense forests will be completely destroyed by the beginning of 21st century.

Paulo Zucula was addressing the ongoing National Conference on Environment and Development in Maputo this morning.

Conference Examines Proposals for New Environmental Institutions

MB1210122491 Maputo Radio Mozambique Network in Portuguese 1730 GMT 11 Oct 91

[Excerpt] The national conference on the environment and development began in Maputo on 7 October. It closed today with study groups discussing issues related to various proposals regarding the institutionalization of the environment. [sentence as heard]

Some have proposed that an environment ministry be created to function as the centralized institution on environmental affairs [words indistinct] state secretariat. Other delegates to the conference suggested instead that a land and environment ministry be created.

Also on the subject of the institutionalization of the environment, there are plans to create a national environment council that will have the participation of ministries dealing with environmental affairs. [passage omitted]

Natural Resources Minister Views Nation's Main Environmental Problems

MB1210155691 Maputo Radio Maputo in English 1100 GMT 12 Oct 91

[Interview with John Kachamila, natural resources minister and government coordinator on environmental questions, by Maputo Radio's Ian Christie in Maputo on "Saturday Outlook" Program; date not given]

[Text] A key figure in the one week international environment and development conference which ends today in Maputo is John Kachamila, Mozambique's natural resources minister and the government coordinator on environmental questions.

Before the conference began, Ian Christie asked Mr. Kachamila to single out the biggest environmental problems in Mozambique today.

[Begin recording] [Kachamila] Well, perhaps we could say war. It is probably one of the main problems of environment in Mozambique, because war has caused poverty. War is causing degradation of land in some areas, especially on the coastal areas where over 50 percent of the population is concentrated.

War has caused a rapid emigration of population to big cities, causing all the problems of sanitation which are quite evident in a number of our cities. Occupation of land around the big cities stretched the capacity of the soil. As you know, we have got a lot of erosion problems, whether in Maputo, Beira, or Nacala.

So, for us, we find these are the main causes of environmental concern that must be thought up first, that could be addressed, is that of the situation of war is reduced [sentence as heard]. Of course, there are other problems but we cannot ignore which we find they are quite important for us, for which we have to try and make very very big efforts [sentence as heard]. We have the problem in Mozambique which is very known—the problem of bush fires which is destroying a lot of the forest, you know, and of the vegetation. We have the problem of senseless killing of fauna which of course in part is part of war. As you know, we have repeated many times to say that Gorongosa, in fact, was a national park. It is one of the best national parks in the world. Today, the situation is completely different. We have Marromeu which is another national reserve where among the many habitats [as heard] was the buffalo which some 10 years ago was over 40,000 and today we have less than about 3,000 buffaloes. So, these are also part of the main problems of the environmental concern in Mozambique.

[Christie] What about [words indistinct] we heard about the destruction of the (mangrove) on the coastal areas. Is that having a bad effect on Mozambique's economy?

[Kachamila] Yes. I would say yes. As I have mentioned at the beginning, I said over 50 percent of the Mozambican population lives along a very small strip of land. All the big cities are concentrated along this strip, so that the pressure put on the environment is high, especially with the incoming, with the influx of people who are getting away from less secure areas in the interior of the country. [end recording]

NIGERIA

Poachers Threaten Kainji Lake Park

92WN0025A Lagos THE GUARDIAN in English 26 Aug 91 p 25

[Article by Ayuk Atim Nchor; "Poachers Threaten Conservation at Kainji Lake National Parks"]

[Text] Most countries, including international organisations, are disturbed by the alarming rate the environment is undergoing deterioration. The present trend is as

a result of man's destructive tendencies on his environment. This situation is also having serious devastating effect on the country's wildlife resources as a result of the integral role the forest plays in the provision of forage for wildlife species and as a major component of wildlife habitats.

In recent times, there has been a global concern on matters related to the deplorable state of our environment.

Man's survival depends on the state of his immediate surroundings. The general environment of the earth has, however, been undergoing some remarkable climatic changes with resultant disastrous effect.

Dangerous gases have been emitted from factories into the atmosphere, while toxic materials are reported dumped especially in developing countries. This has given scientists as well as conservationists much concern all over the world.

In Nigeria, the total area of land which can be classified as forest/wooded land, is about 92.4 million hectares. This is less than 25 percent of the country's land area, a situation which is a short fall from the 25 percent minimum prescribed by the Food and Agriculture Organisation (FAO).

The rest is covered by arable land under cultivation, permanent meadow and pastures. The present trend is as a result of man's destructive tendencies on his environment. The situation is also having serious devastating effect on the country's wildlife resources as a result of the integral role the forest plays in the provision of forage for wildlife species and as a major component of wildlife habitats.

The destruction of Nigeria's wildlife resources has reduced the population densities of some species to very critical levels, while others are threatened with extinction.

Most countries, including international organisations, are disturbed by the alarming rate the environment is undergoing deterioration. Consequently, the United Nations has waded in with the establishment of an environmental protection programme known as the United Nations Environmental Programme (UNEP).

In 1988, it again commissioned the Intergovernmental Panel on Climatic Condition (IPCC). These groups among other things are to assess the situation and other climatic trends throughout the whole world, find out the impact on social and economic life of the environment and suggest strategies to overcome these adverse effects.

In Nigeria, the Federal Government's involvement in matters affecting the environment is quite commendable. In 1988, the Federal Environmental Protection Agency (FEPA) was established through the enactment of Decree No. 58 of 1988. This empowered it to ensure an enforcement of a clean pollution-free Nigerian atmosphere.

The law provides stiff penalties against individuals and corporate bodies caught discharging harmful wastes into the air or upon the land and waters of Nigeria. The agency is to cooperate with federal and state ministries, local government councils, statutory bodies and research institutes on matters and facilities relating to environmental protection.

A Natural Resources Council (NARECO) has also been recently established with the president, commander-in-chief of the armed forces, as chairman. The composition of this body and its advisory body cuts across professionals in the fields of natural sciences, engineering, commerce/industries, and medicine.

The body which is primarily concerned with the extensive monitoring of environmental disaster areas in the country, also ensures that there are effective control measures against possible environmental hazards during the planning and implementation of development projects.

In the areas of wildlife, additional national parks are proposed for Cross River, Gongola, Kano, Bauchi and Bornu states, in addition to the existing two—Kainji Lake National Park in Niger and Kwara states and Old Oyo National Parks, in Oyo State. The on-going level of development in Nigeria's premier parks—the Kainji Lake National Park is a practical demonstration of the present administration's commitment to the protection of the country's environment in particular and it's wildlife resources in general.

The Kainji Lake National Park, which was established in 1976 through a merger of two former game reserves—Zugurma Games Reserve in Niger State and Borgu Games Reserve in Kwara State and backed by Decree No. 46 of 1979—is the first attempt to manage our wildlife resources at the national parks level. The success of this experiment must have influenced the government's decision to increase the number of national parks to six.

However, poaching has continued to constitute one of the greatest management problems of the Kainji Lake National Park. Other problems include illegal bush burning, grazing, fishing, logging, and trespassing.

Poaching is the capturing or killing of wildlife (animals, birds, fish) without permission. This illegal act is perpetrated through the use of guns, traps of various types and sizes, as well as poisonous chemicals. The implication of these acts on wildlife species is the decimation of animal numbers resulting in low population densities of wildlife species in areas where poaching activities are very prominent. High incidence of poaching can lead to some species being endangered and ultimately their extinction.

Very important species like the black rhino, giraffe and giant eland are now extinct in the Savannah Zone of Nigeria due to very destructive overhunting by hunters. In the southern part of the country, the manatees and pygmy hippopotamus are endangered as a result of

overhunting and oil pollution while the gorilla, forest elephant, chimpanzee and chevrotain are either extinct or endangered.

In the Kainji Lake National Park, the activities of poachers could lead to the migration of some wildlife species to areas that are quite inaccessible. In some cases, the animals become shy and wary of tourists and consequently difficult to sight while some are maimed and constitute potential danger not only to management staff but tourists as well. The present deplorable situation of elephant sightings in the park could be attributed to some of these factors.

With increasing human factors like population as well as the employment of sophisticated weapons, the activities of poachers have been on the increase. Apart from this, the park has an area of 5340.82 square km, thus operations of the park antipoaching patrol team will definitely not be able to cover the entire area at any particular time.

However, there are seventeen patrol posts in both sectors of the park. Each of this is manned by at least three park guards who carry out regular surveillance and dispatch situational reports to the headquarters.

In such a move early last year, an outstation report indicated that a total of 1,000 hunters had advanced from neighbouring states of Sokoto and Niger and headed to the park for a hunting expedition. The invaders, who were fully armed with 88 hunting dogs and traps, were heading to the park in four articulated trucks.

It took the combined team of 50 park guards and 12 soldiers from the 221st Tank Battalion to stop the move to massively invade the Kainji Lake National Park. Eighteen of the poachers were arrested, while the others fled on learning of the arrangement to involve other agencies in the antipoaching team.

SEYCHELLES

Islands' Conservation Efforts Highlighted

92WN0023A Victoria SEYCHELLES NATION in English 21 Aug 91 pp 1, 2

[Article: "Paradise Regained, Seychelles' Conservation Efforts Get Worldwide Publicity"]

[Text] "Whoever coined the phrase 'small is beautiful' must have had the Seychelles in mind. But amidst the swaying palms there is a battle going on to recreate the natural beauty of this isolated country."

This is the introduction to an article in the summertime issue of the GREEN magazine which focuses attention on the islands' efforts to protect its environment.

The magazine, as its name suggests, is dedicated to the environment, and the article was also great publicity for Seychelles' tourism.

It is about the delicate ecosystem of Seychelles. It says paradise is getting harder to find these days and used Seychelles' ambitious Environmental Management Plan and Investment Program 1990-2000 as a good example of a nation's efforts to stop the degradation of the environment. The article refers to the islands' appeal for over SR300 million overseas to help its conservation projects. The efforts include legislation to limit the number of tourists arriving in Seychelles in a year. The money promised at the Paris donors' meeting will be spent over the next ten years on setting standards for air, water and soil quality, ensuring that toxic waste is dealt with properly, guarding against oil spills, checking fish stocks and environmental training.

The magazine says these are essential to preserve the islands' ecosystem.

It quotes President France Albert Rene's comments on the need to preserve the environment: "I believe that every island in the Seychelles is like a tiny spaceship, a self-contained unit with finite resources which need to be used and managed on a sustainable basis for us to survive. We live on small, remote and vulnerable ecosystems, but that should not mean we have to be islands unto ourselves."

This was in reference to the nation's aspirations towards a better living standard but also of the care needed to prevent development's degradation of the environment.

GREEN mentioned the Global 500 award won by Mr. Guy Lionnet for his outstanding contribution to preserving the endemic wildlife of Seychelles.

The country has more protected land area relative to size than any other country in the world, GREEN tells its readers.

It also reports that the conservation measures, such as the recent ban on the import of cars to reduce jams which clutter Victoria, have so far held back the devastating effects of development, mainly tourism.

It quotes Mr. Lindsay Chong Seng as saying that Seychelles has got very little else other than its natural beauty.

Mr. Jivan Shah agrees: "In many ways this is the last paradise. There are things in the Seychelles that should not be touched for centuries to come. We should leave them for the mystery of life."

Another paper, INNOVATION, says Seychelles is the first country to develop an environment management plan.

"We can take inspiration and hope from many positive signs," the paper quotes Mr. Mustafa Tolba, the executive director of the United Nations Environment Program, on his comments on Seychelles' plans to manage its environment.

Mr. Tolba used President Rene's words that "sustainable development is a shared global responsibility and challenge to all peoples and countries" when he referred to UNEP's own efforts to help the peoples of the world.

The paper has promised a full report on Seychelles environmental management plan in its next issue.

The TOMORROW, THE GLOBAL ENVIRONMENT MAGAZINE asked: "Can an island paradise invest in tourism without sacrificing its sensitive environment?"

In answer, the magazine said the Seychelles are trying to strike a balance with a tough environmental plan that makes "sustainable development a guiding principle."

The magazine also used Mr. Rene's words in publicising Seychelles' environment policy: "It is vital for our future to protect what we have, since our islands are small and our natural resources limited. For this reason we must blend into the environment without harming it. We have even set aside entire islands to conservation".

On the islands' 1990-2000 Environmental Management Plan, it says the strategy may well set an example for other developing countries.

"Tourism and fishing make up our economic base," Mr. Bertrand Rassool, the director general in the Ministry for Planning says in the article.

"Both depend on an unspoiled environment, which must be preserved at all costs. Our goal, therefore, is a total integration of environmental thinking in all segments of society," Mr. Rassool adds.

Biologist and director of National Parks and Conservation, Mr. Nirmal Jivan Shah, said in TOMORROW, THE GLOBAL ENVIRONMENT MAGAZINE that the islands need to motivate the average person in the street, that is, according to him, "The Seychellois need environmental education."

He adds that he was never taught anything about the Seychelles' environment in school since "The course curriculum was written in England!"

The articles are colourfully illustrated.

SOUTH AFRICA

Wetlands Conservation Project Initiated

92WN0032C Johannesburg THE STAR in English 28 Aug 91 p 18

[Article by Sapa and James Clark: "Moves To Keep South"]

[Text] With Lake St. Lucia threatened by a proposed opencast mine and Nylsvlei in the Transvaal badly hit by successive droughts, the government is intensifying its drive to protect wetlands.

Environmental Affairs Minister Louis Pienaar announced in Pretoria at the weekend a programme which will be a cooperative venture between his department, those agencies responsible for the management of wetlands, and wetlands researchers.

In some important catchment areas, he said, 90 percent of the wetlands which, among other things, keep rivers flowing throughout the year, have been destroyed.

The intention of the new programme is to stimulate agencies to implement the provisions of the Ramsar Convention on wetlands of international importance especially with regard to waterfowl habitat.

South Africa was the fifth signatory to this international agreement.

There was a story recently that it had pulled out. The misunderstanding arose from the fact that it pulled out of the International Waterfowl and Wetlands Research Bureau, a British body which advises Ramsar.

A spokesman for the department told THE STAR: "We remain a party to Ramsar. There's never been a question of us pulling out."

(South Africa—before the question of mining St. Lucia became widely known—had St. Lucia listed as a specially protected "international wetland" under the Ramsar agreement. Its status as an internationally important wetland remains unaltered, I was told.)

In his statement Mr. Pienaar said the publication of a national policy on wetland conservation was of cardinal importance and was being formulated, as was an inventory of wetlands and their status.

"Wetlands have been misconceived as waste land for too long in South Africa," he said.

"The resulting developments have caused the degradation, loss or destruction of a large number of our wetlands.

"To what extent no one knows for sure, but studies have indicated that over 50 percent of South Africa's wetlands have been destroyed by technological developments as well as population pressure."

Mr. Pienaar said a large percentage of the country's remaining wetlands was in poor natural condition.

Whale Hunting Banned in South African Waters

92WN0032B Cape Town WEEKEND ARGUS in English 7 Sep 91 p 7

[Text] Whale hunting will not be allowed in South African waters in the foreseeable future.

The Minister of Environmental Affairs, Mr. Louis Pienaar, said this in Hermanus during a ceremony to unveil an information plaque on whales.

South Africa, like most members of the International Whaling Commission, wanted to maintain the ban on whale hunting until a management plan, based on an exhaustive scientific study, had been accepted.

Clean Air Association's Pollution Monitoring Programs Described

92WN0034A Johannesburg ENGINEERING NEWS in English 13 Sep 91 pp 25-26, 32, 36

[Interview with Gordon Grange, executive director of the National Association of Clean Air, by Julia Murphy]

[Text] [Question] NACA [National Association of Clean Air] has been involved in the monitoring programme in Soweto.

What is the degree of pollution in this area and how does it compare with other air pollution trouble spots in South Africa and in the world?

[Answer] NACA has a branch in Soweto and while the Health Department of the Soweto Council and the Schonland Research Centre of the University of the Witwatersrand are also involved in this monitoring programme, it is being operated under the auspices of NACA with money from the Research Centre and the Soweto Council.

The pollution in Soweto is terrible; the reasons being that coal is used in cooking and for space heating and that the low smoke stove which we tried to introduce years ago has not been that successful as it only reduces the smoke by about 40 percent.

Also these stoves are difficult to light and people tend to remove the bricks between the combustion chambers to make them easier to light which removes the efficacy of the stoves.

All black townships have high pollution levels so I cannot say that Soweto is the worst by any means.

The only thing that could possibly reduce this is the socio-economic upliftment of the people where they can afford heating that is not producing smoke and acquire brick houses with proper ceilings so that this heat does not continually escape and when they start using electricity.

[Question] What other air monitoring programmes are being undertaken in South Africa?

[Answer] Eskom has a very full network throughout the Eastern Transvaal and wherever else they are generating electricity, the Department of Health and CSIR also have a widespread monitoring programme, and individual firms such as AECI and Iscor also do individual monitoring of their own.

Eskom makes all of its results available to the public and do try to minimise power station pollution as much as they can by engaging in the high stack principle which does disgorge the SO_x and NO_x above the surface inversion layer which is approximately 280m above the earth where they get diluted in the upper atmosphere so that the amount of sulphur that effects the surface from these power stations is not as much as one would expect.

Monitoring has shown that the smoke free zones in the cities are effective but it is the townships and squatter camps which are not smoke free zones that are the problem and until such times that we can obtain smoke-free fuel which is of a price which can compete with coal can we get away from smoke in these areas.

There is work being done at Wits by Professor David Horshall and the CSIR to produce a smokeless fuel.

[Question] What impact is electrification likely to have on township air pollution?

[Answer] It can only be beneficial; it will cut down the amount of smoke in the area, but in many houses the coal stove is still going to be used.

Electricity costs at least double and coal stoves heat more of the house for less than any electrical gadget.

[Question] Air pollution control officers are still not obliged to involve nongovernment bodies in the formulation of guidelines—is there any chance of more public accountability to be enshrined in air pollution legislation?

[Answer] The State President's Council has for the last couple of years been investigating what should be done about environmental issues and the management of the environment in South Africa.

I understand that the report will be out this month and NACA hopes that its submission to the President's Council in which we asked that the guidelines set be opened to public discussion so that the public can be involved in listening to the reasons for setting the guidelines so that they have a voice and can argue their views.

At the moment as you say the act does not require it.

[Question] If the environmental protection agency policies of the United States were applied in South Africa, how much cleaner would South Africa's air be?

[Answer] It must be cleaner because in the thermal power stations all the SO_x and NO_x have to be eliminated by using desulphurising plants whereas we have no such plants.

We are, however, removing the majority of the particulates with our ESP's [electrostatic precipitators] and particularly now that they have started sulphur trioxide infusion, our power stations are a lot cleaner.

The fact that they use lead free petrol and insist on it and that cars are driven with catelytic converters must also mean that their air is cleaner.

Granted in areas with high concentrations of populations like Los Angeles which also suffers from inversion layers they do get very high pollution from their traffic and they would be worse than we are by a long way when you consider LA's population density.

The expenditure on removing particulates from flue gas emissions in the United States is approximately a third of the total amount spent on removing all emissions, whereas in South Africa it is 80 percent which shows that we are far behind the United States since most of our expenditure is spent on removing particulates rather than gaseous emissions.

What are the technological trends with regard to air pollution control and how effective is the air pollution control equipment at power stations in the eastern Transvaal.

The technological trends are better electronic controls in the ESP's and the fact that they are infusing sulphur trioxide into the flue gases which brings up the efficiency of the ESP's to somewhere above 98 percent, has helped things enormously as far as particulate removal is concerned.

Sulphur dioxide and the NO_x are in fact still going into the atmosphere however the high stack principle used by Eskom would appear to be reasonably effective.

Particularly in this country, we cannot afford to erect desulphurisation plants in our power stations, because it would cost something like R1-billion and the running costs would go into the millions a year.

When you think that you can electrify 460,000 houses for R1-billion, it would appear correct to spend money on electrifying of our townships rather than remove the sulphur from the power stations which is in fact being discharged above the surface inversion when those townships are producing sulphur on the surface in much higher concentrations due to the burning of coal.

Maintenance operation has to be of a high level to have the ESP operating to acceptable levels, however, obviously if your operating is bad—for example—if you only have it running 50 percent of the time, although it may be running at 99 percent perfect for that 50 percent, it is better probably to have it running 80 percent for 100 percent of the time and taking more of the pollutants out of the atmosphere.

[Question] It has been reported that several power stations are exceeding the legal limit of air pollution—given the huge cost of installed equipment in the form of electrostatic precipitators (ESP's) at these power stations—how is it that these limitations are being exceeded?

[Answer] I have not got any evidence of the power stations actually breaching their agreements, however, I believe they have in the past and with this policy of infusing sulphur trioxide into the flue gases in the stacks it would appear they are reaching the levels for which they are called on to reach with regards to particulates.

If they are being exceeded it is largely due to the fact that our coal is a low sulphur coal and we need additional sulphur in the flue gases to make the precipitator work to its ultimate degree.

Also our coal is of a rather poor quality and we have to burn a lot more than they do with the American or European coals to produce the same amount of energy.

In fact we are burning something like three tons a second of coal producing the energy in this country and one ton a second producing our petrochemicals, so it is about four tons of coal a second that we burn in this country.

The limitations can be exceeded by poor training of the maintenance people, however, this is something I believe Eskom continually tries to improve.

Human factors always cause inefficiencies.

[Question] Could you comment on the different challenges to air pollution controllers presented by, on the one hand, particulate matter, and on the other hand gaseous pollutants, illustrating which is the lessor of two evils and methods of combating each?

[Answer] Firstly particulates are what you see, the very dark smoke emitted from smoke stacks.

The gaseous emissions are the sulphur dioxide and NO which are not visible. It is the NO_2 that is slightly visible and can be seen as a brownish tinged smoke.

In the main particulates are what is seen and provided all the particulates are being removed there should only be a very faint haze on top of smoke stacks.

While both are evil, you need ESP's or bagfilters to deal with particulates and there is a certain amount of SO_2 that actually does come out in the ash, particularly if you are using a bag filter.

A desulphurisation plant which scrubs the SO_2 from the flue gases is needed to remove SO_2.

Secunda has a desulphurisation plant which removes the sulphur for use as pure sulphur.

[Question] NACA is involved in training maintenance staff to operate power station ESP's correctly. Why is it that legitimate milligrams per cubic metre limits are still being exceeded?

[Answer] This can only be because of maintenance programs not being kept to or human errors being made by the operating staff.

Yes we do involve ourselves in training in that there are certain personnel who are active members of NACA who do give lectures and run courses, not on behalf of NACA itself, but certainly we do encourage this.

[Question] Which technology is advancing faster, bag filter or ESP technology and are the prices of these two systems still virtually on a par for similar size installations?

[Answer] The capital costs are similar still and the running costs are the same provided you get a three to four year life from the bag.

The technology of bag filters has improved recently and is being improved because ceramic filters are being brought in and the new fabrics are moving towards considerably longer life.

There is also one big advantage about bag filter plants in that you do not get anything coming out of the stack—it is absolutely clear.

[Question] What is in greater use in South Africa, bag filters or ESP's or flue gas desulphurisation plants and which of the three systems do you personally favour and why?

[Answer] ESP's are in greater use, there is one bag-filter plant installed at Rooiwaal which is working extremely well and another one being installed at Kelvin B station, but other than that Eskom has followed the ESP route with a high stack to discharge the SO_x and NO_x above the surface inversion layer.

The gases do get trapped between the surface and upper inversion layers between 280m and 1200m-1500m above the surface and between these two inversions there is quite a bit of turbulence and you do get a diffusion of the gases.

It is estimated that as far as acid rain in concerned, natural rain in South Africa, if you had no power stations would be at about a 4,7 pH, whereas we are getting rain of about 4,5 pH.

It is 0,2 of a difference that is probably caused by the sulphur being produced not only in our power stations but also from townships, so while the deposition has been increased, it is not a huge amount that has been caused by the power stations.

With an ESP, the particles of carbon and ash have an electrical charge imparted to them causing them to collect on plates of an opposite charge, whereas with a bag filter the gases are put through a large number of tubular bags and all the particulate matter is collected on the one side like a large vacuum cleaner.

So with this method all particulates get removed, even a certain percentage of the sulphur dioxide.

While bag filters can also break and the bags become blocked and you can get a certain amount of leakage, it is normally a matter of putting it through one set of bags and then another, and by and large you get a completely clear stack.

It was felt that in this developing country which has a tremendous amount of unemployment, where the pollution levels of the Eastern Transvaal may be borderline, certainly we have been warned that we must not let them get worse, we have got to tread very carefully in deciding how much we have to spend to remove pollution and how much we have to put into developing the people.

With our power stations the decision has been taken that ESP's will be used to remove particulates, if you were to retrofit it would cost an enormous amount of money to put in bag filters although this has been done at Rooiwaal power station, north of Pretoria.

It would be marvelous if we could put desulphurisation plants into the thermal power stations, however it would cost an enormous amount.

There has been good improvements in the flue gas desulphurisation techniques just recently.

For example in the past there would have to be two operations—there would be scrubbing and then the discharge went through oxidisation so that the calcium sulphite could be changed to calcium sulphate.

This is now being done in one vessel so there is a large reduction in costs.

[Question] SO_3 additions into flue gas and superior electronic controls have increased the effectiveness of ESP's in recent years. Have any steps been taken to improve the other two methods and is there any chance of a completely new air pollution control being introduced?

[Answer] Bag filter technology is developing, there is no doubt about it.

Fabrics and the way of cleaning bag filters have improved and this has improved the life of the bags.

Technology to reduce the cost of bag filter operation is ongoing.

There are ongoing improvements to bag filters and ESP's and desulphurisation techniques as outlined in my previous answer but there are, to my knowledge no brand new air pollution controls being developed.

[Question] What steps do you recommend to combat the entry of asbestos fibre into the air particularly when asbestos structures are being dismantled or demolished and is the legal limit still set at two fibres per cc?

[Answer] Yes the legal limit is still two fibres per cc.

Provided the structure is kept wet and the personnel doing the dismantling wear respirators there should be no danger in the dismantling of asbestos structures.

However, care should be taken and one hopes that people realise the danger involved and in fact take the necessary precautions.

[Question] What are the chances of lead in petrol being reduced from the present 0,4 grams per litre to the more acceptable 0,2 grams per litre?

[Answer] We have come down from 0,8 to 0,6 and then to 0,4 so there has been considerable improvement already in the legal limit of lead in petrol.

It will cost a considerable amount of money to reduce this further and the decision would have to be taken by the authorities in the light of evidence that was brought forward from monitoring to see that it needed to be taken down further.

At this stage I know of no further plans to reduce it.

My understanding is that the monitoring programmes in the city show that the heavy metals are (excepting under very adverse conditions of traffic) at acceptable levels.

[Question] Is there any proof yet that exhaust fumes from motorcars are depleting the ozone layer and how could the enforced installation of autocatelysts assist in this regard?

[Answer] Motor cars are really producing the Greenhouse gases; that is CO's, CO_2's and the NO_x's.

It is the CFC's that are depleting the ozone layer and as South Africa has become a signatory to the Montreal Protocol we are reducing the CFC's which are being used.

There is a certain amount of methane that comes from motor cars and methane does damage the ozone layer after it goes through a number of chemical changes, but the amount of methane that is coming from agriculture is probably much more damaging.

[Question] What more could be done to remove SO_2 and NO_x from the Eastern Transvaal Highveld area?

[Answer] Here we are referring to the thermal power stations and it would mean that desulphurisation plants would have to be installed at a cost of some R1-billion per power station.

Professor Horshall's concept suggests that we should be improving our coal washing techniques to remove a large percentage of the sulphur present in the coal.

His concept suggests that there should be three grades of saleable coal coming from the washing plant, the one for export, the next, a grade of coal suitable for power station use and the third that fraction of the coal which is suitable for briquetting as a smokeless fuel.

This latter product could be burnt in the coal stoves in the black townships and would be a reasonably priced smokeless fuel.

[Question] What collective action is being undertaken by sub-Saharan African countries to combat air pollution?

[Answer] NACA does correspond with the air pollution parties in Zimbabwe and does correspond with the United Nations Environmental Protection Organisation in Kenya, however I know of no collective action being undertaken other than efforts by the International Union of Air Prevention Associations (IUAPPA) to encourage the formation of Clean Air Organisations in all countries.

NACA has undertaken to try and do this on behalf of the Union in the states bordering on South Africa.

[Question] What role will the Indoor Air Quality Chapter of NACA play in the fight against air pollution and what do you hope to achieve through the Chapter?

[Answer] A couple of years ago we brought out Professor John Spengler, from the States, who is one of the world's renowned authorities in indoor air pollution and this brought about tremendous interest from people that are involved in air conditioning and the architects that are involved in the design of new high rise buildings.

Because these people have this particular interest in indoor air pollution it was decided recently at a conference run by NACA-Indoor '91, that a Chapter should be set up within NACA and with the same autonomy as the various regional branches which would concentrate on indoor air pollution.

This means that those people who are particularly interested in this will have an organisation where they can share their interest still within the overall umbrella of the National Association of Clean Air.

We hope that by getting people interested and making people aware of indoor pollution that steps will be taken by developers and by the architects to improve matters and protect the health of the workers.

[Question] How bad is indoor pollution in South Africa when compared to overseas?

[Answer] At this stage no comparitive results have been made available.

A technical subcommittee has been established by the Chapter and it will be doing comparisons, and the results will be made known as they become available.

[Question] Is it being sufficiently monitored?

[Answer] Not at this stage, however the Johannesburg City Council has set up an Indoor Air Quality section under Richard Truter and so far some six to 12 buildings have been monitored.

I expect that results from their findings will become available in due course.

[Question] Are there any other issues you would like to discuss?

[Answer] It is hoped that the IUAPPA World Clean Air Congress which is to be held in 1998 will be held in South Africa.

We are making a bid for this at the IUAPPA Executive Committee to be held in Seoul, Korea, in September this year.

We believe we will be successful in the light of the new South Africa.

During October last year we ran the first regional IUAPPA conference where we had over 400 delegates.

Thirty-four percent of the papers came from outside South Africa.

This year we ran the first "Indoor '91" which drew 240 delegates.

We ran a follow-up to the World Coal Institute Conference which was held in London in April, in August and had over 140 delegates attend.

A major achievement has been that we have been able to finance overseas speakers for all of these conferences.

We hope that the efforts of NACA in educating people and making them aware of the need to prevent air pollution will result in cleaner air in South Africa.

Government, ANC 'Sustainable Development' Policies Examined

92WN0032D Johannesburg THE WEEKLY MAIL in English 20-26 Sep 91 p 22

[Article by Lesley Lawson, a researcher for the Group for Environmental Monitoring (GEM): "Develop but Don't Destroy: South Africa Is Searching for a Solution"]

[Text] One night last year in a hut in Lebowa's faraway blue mountains Herbert Monnye told a tale about the killing of a leopard.

With intense pleasure he described the death groans of the great beast, and his pride at snaring the last of the area's leopards. For years they had been killing his sheep, and now they were gone.

Feeling aggrieved on behalf of the leopard and other supporters of biodiversity, I decided to pursue a strict line of questioning. "How would you feel," I asked, "if that had been the very last leopard left on earth?" Monnye's grin only widened. His reply was along the lines that the one who finally eliminated this vermin would be a true king among men.

I thought about Monnye's story in the context of the current discussion around sustainable development.

The concept of sustainable development, in use since the 1970s, has been defined in United Nations literature as "taking care of the needs of the current generation, without compromising the ability of future generations to meet their own needs." It centres around the idea that conservation and development are essential parts of one process.

The debate around sustainable development has been given new life by the coming United Nations environmental summit to be held in Rio next June. Here the twin challenge of environmental abuse by the world's rich countries and environmental degradation caused by poverty will be addressed.

Heads of state will be asked to commit themselves to targets and schedules for solving specific environmental problems. First World leaders will also be asked to approve resolutions on environmental aid to Third World countries—especially in the area of scientific and technological capacity.

The Earth Summit has also stimulated the debate around future environmental policy in South Africa. Several groups are attempting to define the components of sustainable development.

The CSIR [Council for Scientific & Industrial Research] is under contract to the Department of the Environment to produce an environmental report on sustainable development in South Africa for the Rio conference. Opposition groups like the African National Congress [ANC], the Pan Africanist Congress and the Western Cape's Environmental Monitoring Group (EMG), are also working on environmental policy statements. At present all groups have working documents in draft form. The President's Council report on the environment, which contains detailed policy recommendations, is also in draft form.

So far the approaches have fallen into two types—those that describe the state of the nation and those that reiterate long-term goals of a sustainable society.

The CSIR-government report represents a detailed database—drawing together nationwide research in the areas of water, air, waste, energy, biodiversity, soil loss, marine pollution and community health. The report is essentially a statement about the current state of the environment. When it comes to future policy guidelines it peters out.

Although the report acknowledges the human-centred approach of the UN literature, its own approach remains scientific. Because of this it fails to foreground our central challenge—how to produce the kind of development needed to meet peoples' basic needs, without further destroying our environment.

The documents from the opposition have reverse weaknesses. They are human-centred and focus on recommendations for sustainable development but lack a sound database. They are essentially documents about long-term goals—without exploration of how we can get from here to there. For example the EMG document

talks of the need for our economy to shift away from gold and coal to a renewable resource base, without exploring the economic implications.

The ANC document is perhaps the most realistic in its insistence on research around future options. Some of these are "economically viable alternative sources of domestic energy," alternatives to agricultural chemicals and community management of conservation areas.

What is lacking in our environmental policy thinking is clear and realistic strategies for moving from where we are now to a more sustainable society. But these can only come about as part of an ongoing debate between scientists, environmentalists, economists and politicians.

Another crucial plank in international sustainable development thinking is the need for public involvement in policy decisions and development planning.

But if Monnye had a say in national environmental policy, the leopard would be done for. It thwarts his ability to meet his basic needs.

Before environmentalists talk of a sustainable development policy for South Africa, they need to understand the needs of ordinary people.

Wildlife Preserves Becoming 'Political Issue'

Conflict With Locals

91WN0747A Johannesburg THE WEEKLY MAIL in English 16-22 Aug 91 pp 20-21

[Article by Eddie Koch and Lesley Lawson]

[Text] South Africans, from politicians to farm laborers, are realizing that game reserves and the future of the country's wildlife are a burning political issue.

Pull up at Paul Kruger Gate and a game ranger resplendent in khaki uniform and flashing epaulettes will snap to attention and throw a crisp salute before opening the security boom that blocks your way into South Africa's biggest game reserve.

For some it's just a quaint tradition that provides an element of mystique for the tourists who have come to this unspoiled tract of Africa for a taste of adventure. But for others, especially rural people who live on the borders of the reserve, the martial ritual reinforces a widespread belief that game reserves are part and parcel of apartheid's security apparatus.

This perception is emerging as a major problem for conservationists who are concerned that the political changes sweeping South Africa may lead to popular demands for reserves to be expropriated and redistributed.

"As long as we believe that we can protect the wildlife of Africa through military methods then we have to get it wrong," says John Hanks, executive director of the South African Nature Foundation.

"There is no doubt that valuable and threatened species are under attack as never before and there is a need for these to be protected, especially against well-armed and well organized bands of poachers.

"But if access of local communities to wildlife is stopped by paramilitary personnel, then conservation is bound to become a political issue."

The solution, says Hanks, is for game reserves to be set up in such a way that local communities are given controlled access to the resources of the area and a share in the profits that are generated by tourism.

He also points out that conservationists can offset rural unemployment by employing local people as game guards. And if an effective community approach to conservation has been set in place, these guards will have a direct interest in protecting their reserve from poachers.

"Game rangers often put their lives at risk when they work in areas where there are well-armed and trained units of poachers. They need to be effectively trained to protect themselves and they must be able to carry out effective police work—such as how to collect evidence, conduct undercover investigations and prepare charges against poachers," says Tony Ferrar, executive director of the Wildlife Society of Southern Africa.

"But this military aspect of running nature reserves poses a dilemma that we have recognized for the last 10 years. It does not create goodwill among the local people towards the species that need protection nor does it make for liaison and dialogue between game wardens and their neighbors."

Ferrar believes it is important to strip conservation of as many martial rituals as possible and to keep paramilitary operations in reserves to a minimum. "We must get rid of the colonial mentality that requires game guards to salute everyone at the gate and create the image of rangers as friendly, natural types whose job it is to promote education and awareness of nature and its valuable species."

But the problem is more profound than this. The fact is that game reserves and their administration are deeply intertwined with the operations of the South African Defence Force [SADF] and its efforts to prevent cross-border incursions into the country.

Many game reserves, such as the Kruger Park and Ndumu Game Reserve in Northern Natal, straddle the country's borders and were originally seen as useful security cordons for keeping out insurgents and illegal immigrants.

The SADF has a special unit known as the Kruger Commando to protect wildlife in the park against poachers. It also has another unit, with its headquarters

at Skukuza, which specializes in tracking down and arresting Mozambican refugees who flee across the border from the civil war.

Many of the game rangers which staff the country's parks are former SADF soldiers. A large number of Rhodesian soldiers, including members of the notorious Selous Scouts, joined conservation departments when they fled down south to escape black majority rule in Zimbabwe.

Until recently, at least two reserves in South Africa have been used by the SADF as missile testing sites. Early this year the army handed a large tract of territory at St Lucia in Natal, that had been used to experiment with bombs, back to the natal Parks Board. But the De Hoop reserve near Arniston in the Western Cape is still a military zone and is used for the purpose of testing ballistic missiles developed by Armscor.

And in Namibia, when the infamous Koevoet counter-insurgency unit was demobilized prior to independence, many of its members were recruited into antipoaching units run by the territory's wildlife department and still work there.

More far-reaching efforts are needed to undo the ties that exist between the military and the running of the country's game parks. Unless this happens the negative perceptions which most black people have of game reserves, and the dire consequences that these hold for the future of conservation, will not be resolved.

ANC Policy

91WN0747B Johannesburg THE WEEKLY MAIL in English 16-22 Aug 91 p 20

[Article by Eddie Koch]

[Text] The African National Congress [ANC] will strive to set aside 10 percent of the country's land for conservation, said ANC president Nelson Mandela.

Speaking in an interview with the BBC's Natural History Unit at the Mtethomushwa Game Reserve in the Eastern Transvaal, Mandela presented a detailed outline of the ANC's plans for game reserves in a future South Africa and indicated the organization is beginning to formulate policy on key environmental issues.

"We are very committed to conservation, ecology and the environment and the green in our colors of green, black and gold symbolizes our love for nature and for our land," he said.

The organization would try to abide by the internationally accepted principle that 10 percent of every country should be set aside for reserves, even though the legacy of apartheid had created resentment among black people towards conservation.

"The forced removals that have taken place, especially during the past 42 years, have created a situation where the population tends to oppose anything which is suggested by the apartheid regime," said the ANC leader.

"But we have got a rich heritage with regard to conservation which we would like to preserve and the system of national parks is the best method o preserving this wealth and habitat.

"The International Union of Conservation and Nature has recommended that each country should reserve 10 percent of its land area for conservation. South Africa only reserves about four percent. We are debating this matter...."

Asked how the ANC would respond to demands for land that now forms part of nature reserves to be restored to their former owners, Mandela said:

"Well, the Kruger Park is now an established fact whether we like it or not or how it came about. It has succeeded in preserving valuable wildlife and plants and other biological specimens. It has become one of our riches and therefore we will have to preserve it.

"Different arrangements will then have to be made for the Tsonga people (removed from their homesteads to make way for the reserve) that will involve them in the development of the park and to make sure that they have an effective part in its running. I have no doubt that once they see this is their scheme all hostility would disappear."

Mandela pointed to the Mtethomushwa reserve in kaNgwane, where surrounding communities participate in the running of the park and derive more than 50 percent of its profits, as an effective model to be followed.

Asked if environmental issues would be ignored because of other, more burning issues, that will face a future government in South Africa, Mandela stressed the ANC's commitment to ecological protection was not rhetorical.

He pointed out that air pollution was so severe in some parts of the country that the growth of children had been stunted. "We have human beings whose health and welfare is suffering as a result of the situation. We are therefore bound to carry out our promises."

He noted that environmental protection was an effective method for generating jobs and economic growth.

"Tourism is an important industry and preserving wildlife is an important way to encourage tourism."

Bophuthatswana Park

91WN0747C Johannesburg THE WEEKLY MAIL in English 16-22 Aug 91 p 21

[Article by Bev Geach]

[Text] The government of Bophuthatswana and the Bop National Parks Board (BNPB) recently announced the formation of a new game reserve near Zeerust.

Soon after Bophuthatswana gained independence in 1978, the 50,000 ha Pilanesberg National Park was formed. Since then the park has been trying to justify its existence to the people who were moved off the land.

Promises of access to firewood and income from the park never materialized. The parks board is now trying to repair the damage done to the image of conservation.

Blaming problems on a "breakdown in communications" between BNPB and the people, the officials, under the guidance of director Roger Collinson, are going out of their way to ensure that relationships improve.

The proposed new reserve, covering more than 72,000ha, will be the third largest reserve in South Africa, after Kruger National Park (2,000,00ha) and the Kalahari Gemsbok Park (958,103ha).

The BNPB commissioned an independent study of the area to determine the viability of creating the reserve. The Results, both financially and environmentally, were overwhelmingly in favor of a game reserve.

The only inhabitants of the vast area—alongside the Dwarsberg range north of Zeerust—are 15 or so farmers and about 100 laborers. An Anglican mission school there is debating whether to accept monetary compensation (for loss of buildings) or a new site for the school. The opportunity of moving closer to the community has been welcomed.

Game will be reintroduced in an operation surpassing "Operation Genesis"—the restocking of Pilanesberg.

Provisionally called the Madikwe Game Reserve, the aim is to cater for overseas tourists since this will ensure the highest financial returns. Far more better-paid jobs will be created for the local population this way, than through agriculture or industry.

The parks board has learned a hard lesson and appears to show real concern for communities around parks. A management committee for every park in Bophuthatswana is being set up, comprising parks board officials, community representatives and members of the local tribal authority.

The Madikwe management Committee will probably include representatives of commercial farmers around the reserve.

Allan Mountain, author of Paradise Under Pressure, has been employed on a contractual basis to set up a strategy for the development of Madikwe, which will take place with full approval of the communities in the area. A second committee will be set up, to ensure that community development occurs in conjunction with the development of the reserve.

The Bophuthatswana people are proud of their traditional respect for trees and nature. The land, despite the dryness of the area, is not a degrade as might be expected, given the high population density.

History was made at a ceremony on August 1 when the Bakgatla Ba Ga Kgafela tribe, led by Chief Kgosi Pilane, received a cheque for R20,366. The income was earned through hunting on tribal land which borders on the Pilanesberg Park. As the chief pointed out, if the people did not have a tradition of protecting their natural resources, there would be no game to hunt. The Bakgatla people hope to establish their own game reserve on the land, with the help of the BNPB.

President Lucas Mangope does not have a good record where human rights are concerned, but he and his people are aware of the need for and benefit of conservation. Now Mangope, like those in power everywhere, needs to understand that people are part of the environment and must be treated with the same concern.

Ivory Smuggling Syndicate Uncovered

MB1410175491 Johannesburg SABC TV 1 Network in English 1600 GMT 14 Oct 91

[Text] A syndicate which smuggled ivory from Namibia through South Africa has been uncovered by the Police Special Unit for the Protection of Endangered Species. A man was arrested in Cape Town, and ivory was confiscated in Johannesburg. (Char?) Pauw reports:

[Begin Pauw video recording] We joined the Police Special Unit for the Protection of Endangered Species while they were working at D.F. Malan Airport. Major Piet Lategan and his team had been working on the case for some months, but today all the leads came together.

The suspect arrived at D.F. Malan Airport on the international flight from Windhoek. The police followed a Namibian citizen who farms on a plot outside Grootfontein in the far north of the country. He had come to Cape Town to sell 404 kilograms of ivory. The man has a previous five-year conviction for smuggling ivory and still has a suspended sentence of two and a half years.

The final deal was clinched at the Holiday Inn in Bellville, and undercover agents met the suspect at the coffee shop where they discussed the payment of 160,00 rands in cash for 37 tusks. The money was apparently stashed in a suitcase. The man offered the ivory to the police trap at 400 rands a kilogram, but if resold, it would easily fetch between 600 and 1,000 rands a kilogram. The total consignment would then be worth 400,000 rands.

The farmer from Grootfontein was arrested, but cannot be shown on camera until he appears in the Bellville magistrate's court tomorrow. This is the fourth biggest ivory smuggling case with links to Namibia in recent times. The police believe the ivory had come from Angola. Scientific isotope testing on the country of origin will be done later.

Earlier the undercover operation led to the confiscation of a big ivory haul in Johannesburg. [end recording]

Program To Dehorn White Rhinos Confirmed

MB1510094491 Johannesburg SAPA in English 0928 GMT 15 Oct 91

[Text] Harare Oct 15 SAPA—Zimbabwe conservation authorities have launched a programme to cut off the horns of all the country's white rhino to curb poaching activities, it was confirmed on Tuesday [15 October]. Director of Zimbabwe's Department of National Parks and Wildlife Management, Mr. Willie Nduku, said officers had started the dehorning process in late June in the kaZuma Pan National Park in the northeast of the country and were now working in the Hwange National Park just to the south of kaZuma Pan and the Matetsi safari area adjacent to it. About 40 rhinos had been dehorned so far. "We are dehorning only white rhino," Mr Nduku explained. "We are doing it as an experiment to see what is going to happen to them." He said if the exercise proved successful, the authorities would consider dehorning the black rhino.

Zimbabwe has the world's largest natural reservoir of black rhino—about 1,000—which have come under attack from poachers, reportedly from neighbouring Zambia since 1984.

'Great Green Wall' To Improve Coastal Environment

HK0410083091 Beijing CHINA DAILY in English 4 Oct 91 p 3

[By staff reporter: "Great Green Belt To Shield Coast"]

[Text] A green Great Wall will gradually rise along China's 18,000-km coastline in the 21st century. This forest shelter is designed to improve the ecological environment and soothe the damage caused by the sea, according to a report in China Marine News.

This two-km-deep forest wall will cover 3.65 million hectares. The project will start in 2000 and take an estimated 22 years to be completed.

In the 1950s, China afforested 346,000 hectares in coastal areas. But these forest belts which were frequently disrupted because of the lack of thorough planning, cannot effectively deter typhoons and check soil erosion.

China plans to build 57 million hectares of forest at the end of this century. The project will contribute to the proposed increase of China's forest coverage from the current 12.9 percent to 17.1 percent by the end of this decade, according to the report.

This coastal forest shelter project is one of China's key forestation projects. Other projects include the Three North Shelter Belts (North, Northeast and Northwest China), and forestation on the middle and lowest reaches of the Yangtze River.

The Chinese government initiated a project in 1986 designed to afforest the area surrounding the two largest cities in North China.

Progress in Curbing Urban Pollution Noted

OW0710112191 Beijing XINHUA in English 0838 GMT 7 Oct 91

[Text] Beijing, October 7 (XINHUA)—Three years ago, Benxi, a heavy industrial city in Liaoning Province, was listed by the Chinese Government as the worst polluted city in the country.

At the same time, environmental officials of the United Nations reported that they could not see the city on satellite images because of thick industrial smog.

Today, however, the city's one million residents are delighted that the thick clouds which previously hung over their heads have disappeared. "The air is fresher and rivers are cleaner," according to local residents.

It is only one example of China's successful efforts to curb environmental pollution.

Since China initiated the policy of reform and opening to the outside world in 1978, the country's GNP [gross national product] has grown by 136 percent. Nonetheless, rapid development has not caused the country's environment to deteriorate, said Qu Geping, director of the State Environmental Protection Bureau. "The quality of China's environment has been maintained at the levels of the early 1980s, and even though the country's national economy has doubled, environmental pollution has not followed suit." "During the Seventh Five-Year Plan period (1986-1990), China recorded great progress in combating industrial pollution," said Qu. "The amount of pollutants released by industry did not rise along with the growth in industrial output. For example, during the period the volume of industrial waste water decreased by 0.7 percent, while the volume of harmful substances and heavy metals in the waste water was reduced by 18-50 percent."

According to Qu, the volume of industrial dust in the city declined by 34 percent, while the amount of the processed industrial solid waste grew by 45-143 percent.

In line with the overall control of the country's urban environments, environmental quality in China has been maintained at levels of the early 1980s. "Along with a further development of urban infrastructure and afforestation, china's cities will become even cleaner," said Qu.

China has also opened 606 nature reserves covering over 48.18 million hectares, and has established 734 ecological agricultural research stations.

According to Qu, during the next five years, China will focus its environmental protection efforts on the control of urban and industrial pollution. "Most of the efforts will be devoted to 52 of country's 450 odd cities," he said adding that, "the 52 cities include Beijing, Shanghai, Tianjin, as well as the open coastal cities, tourist cities and provincial capitals."

Statistics show that China's urban population accounts for only 13 percent of the total population, while the volume of pollutants created in urban areas exceeds 80 percent of the total.

Acid Rain Monitoring Network Takes Shape

OW1010091491 Beijing XINHUA in English 0752 GMT 10 Oct 91

[Text] Beijing, October 10 (XINHUA)—China's acid rain supervision and monitoring network has begun to take shape. By now more than 40 supervision stations have become operational, over half of the planned number, the latest issue of the CHINA ENVIRONMENTAL NEWS reported.

Sites of these supervision stations have been selected on the basis of the more than 2,000 meteorological observatories throughout the country, representing a variety of climates.

High-quality acid rain monitoring equipment and qualified observation personnel have been distributed to these stations.

These stations are now capable of providing accurate and detailed observations concerning distribution and changes of acid rainfall in China, and can recommend effective counter-measures, according to the report.

Sino-German Seminar on Environmental Protection, Development Held

OW1010131291 Beijing XINHUA in English 1118 GMT 10 Oct 91

[Text] Beijing, October 10 (XINHUA)—International cooperation on environmental protection should be strengthened to promote global social and economic development, some experts from Germany and China agreed at a seminar concluded here today.

The three-day Sino-German seminar on environmental protection and development was cosponsored by the Association for International Understanding of China and the Friedrich Ebert Foundation of Germany.

Nearly 30 Chinese and German experts discussed environmental policies, control of pollution and the prospect of international cooperation in environmental protection during the seminar.

Pilot Cities for Land Administration Reform Selected

OW1010131891 Beijing XINHUA in English 1135 GMT 10 Oct 91

[Text] Beijing, October 10 (XINHUA)—The State Land Administration has chosen Dalian, Zibo, Baoding, Nantong, Fuzhou, Chongqing and Gongzhuling as pilot cities for comprehensive administration of land, according to the latest issue of the CHINA ENVIRONMENTAL NEWS.

The action signals that China's land administration has entered a new period for comprehensive construction and further reform, the report said.

As early as 1984 China started a detailed survey of its land resources in a bid to make more efficient use of the country's land resources.

To date among the country's more than 2,800 counties, over 600 have finished their work on land survey, and the survey work in other counties is expected to all be finished by 1995.

In the past few years China has carried out a number of successful reforms in land administration.

Achievements in Environmental Protection Cited

OW1310122891 Beijing XINHUA in English 1200 GMT 13 Oct 91

[Text] Beijing, October 13 (XINHUA)—China has made more than 300 important scientific and technological achievements in environment protection over the past five years.

According to the PEOPLE'S DAILY, among the 345 achievements, 86 special projects have passed the state appraisal and most of the scientific and technological achievements reached national or international standards.

Peoples' living environment in China was seriously threatened by industrial pollution as China increased its urban industrial enterprises from 195,000 in 1971 to 377,000 in 1980. Owing to outdated technology and equipment, most of the enterprises were heavy polluters.

The result of a grand investigation carried out between 1985 and 1987 shows that China annually discharges 36.475 billion tons of industrial waste water, 884 million cubic meters of exhaust gas and 343 million tons of solid industrial waste.

In order to deal with these serious problems, Chinese scientists and technicians carried out a series of studies and research in the fields of air and water pollution during the Seventh Five-Year Plan period (1986-1990).

Meanwhile, China also organized more than 500 units and 4,000 experts and specialists for environmental observation and planning. They completed the plan to control the drainage of waste water into the 13 major water areas throughout the country including the Yangtze River and Huaihe River.

In recent years, China has constructed 43 bases for antipollution research and 23 bases for anti-air pollution studies.

Construction of Yangtze Forest Belt Yields 'Remarkable Progress'

OW1410063491 Beijing XINHUA in English 0552 GMT 14 Oct 91

[Text] Beijing, October 14 (XINHUA)—The construction of a forest shelterbelt along the Yangtze River has made remarkable progress, the PEOPLE'S DAILY reported today.

According to the newspaper, 145 counties in nine provinces have planted trees on 1.867 million hectares of land.

The project, which aims at improving the ecological environment in the Yangtze River valley, was approved by the State Council and construction was started last year.

Experimental Centers Promote Ecological Agriculture

OW1610042791 Beijing XINHUA in English 0204 GMT 16 Oct 91

[Text] Beijing, October 16 (XINHUA)—China has set up nearly 1,000 experimental centers for developing ecological agriculture in 172 counties and 273 villages nationwide.

Ecological agriculture refers to the practice of using the relations of interdependency between animals, plants and microorganisms to improve agricultural productivity, today's overseas edition of the PEOPLE'S DAILY reported.

In the past 10 years these centers have successfully bred fish in rice paddies, grown medicinal herbs and plants in forests and cultivated edible bacteria. In addition, they have made progress in the utilization of agricultural and industrial waste.

A survey carried out in these areas shows that the increase of total grain output stands at an average 15 percent, and that of per unit grain output stands at 10 percent or more. In addition, per capita grain output has increased by 21.4 percent. The statistics also show that per capita income in these experimental areas is higher than the national average.

REGIONAL AFFAIRS

Malaysian Prime Minister Calls for United ASEAN Stand on Environment

BK0710042291 Kuala Lumpur BERNAMA in English 0354 GMT 7 Oct 91

[Text] Kuala Lumpur, Oct 7 (OANA-BERNAMA)—Malaysian Prime Minister Doctor Mahathir Mohamed Monday called on ASEAN countries to speak with one voice on environmental issues as individually they will be "victims of global campaigns now being mounted to make us permanent developing countries."

"United we stand a reasonable chance," he said. "Allied with other neighbours our chances become even better."

Opening the 23rd ASEAN economic ministers' meeting (AEM) here, he said ASEAN could no longer remain passive and indifferent to these campaigns hoping that they would, in time, fizzle away.

The campaigns had assumed serious proportions and were being used to obstruct the economic growth of the developing countries, he said.

Noting that the nongovernmental organisations involved had enormous resources and had the support of the so-called "free Western media," he said ASEAN must coordinate its efforts to counter the campaigns before they become more damaging to its economy.

"We can do this through a massive information campaign at the international level and by adopting a common stand on environmental issues," he said.

He added that although this would involve financial backup, the price for not doing it now would be much higher later.

Dr. Mahathir said ASEAN countries were very concerned about environmental pollution but that their capacities to deal with it were limited.

"The developed countries should have a more positive approach rather than threaten to use trade and aid as instruments to force us into doing those things which will retard the growth of our economy and the well-being of our people," he said.

Referring to the forest fires which have cast a thick haze over ASEAN countries, the prime minister said forest fires were more damaging than controlled extraction of timber.

"But whereas the whole Western world is in an uproar over our extraction of tropical timber and threatens to boycott our produce and destroy our economies, there is not a squeak about the forest fires which periodically plague us," he said.

"Perhaps it is because the haze does not spread to their countries. Perhaps it is because they cannot sound as noble as they do when they champion the Penans [primitive tribesmen in Sarawak]."

Dr. Mahathir said there was much that was positive that the rich countries of the North could do about the forest fires.

"Indeed, with their ingenuity and wealth, they can put out the fires as they have extinguished the oil-well fires in Kuwait with such handsome profits," he said.

But none of these things were happening, he said. "There is not a word from the environmentalists of the North or their proxies here."

Solomon Islands Foreign Minister Criticizes French Nuclear Tests in Pacific

BK1010071291 Hong Kong AFP in English 0124 GMT 10 Oct 91

[Text] New York, United Nations, Oct 9 (AFP)—Solomon Islands Foreign Minister Peter Kenilorea Wednesday urged Paris to put an end to its nuclear arms testing program in the South Pacific.

"We continue to be greatly disappointed with France for its nuclear testing program in the South Pacific" and "once again call on France to put an end to this program," Kenilorea said in his address to the UN General Assembly.

French diplomat Pierre Menat insisted that France's nuclear testing in the Pacific did not represent any danger to the region's interests or environment.

Kenilorea also criticized France for bestowing the Legion of Honor on Lieutenant Colonel Alain Maffart, whom Kenilorea described as a saboteur, for having sunk a Greenpeace vessel in 1985 in port in Auckland, New Zealand while at the same time France was exploding a nuclear bomb at an underground site on Mururoa atoll.

It was "a crowning act of selfish defiance and belittling by France of the South Pacific nations' concern for their environment and legitimate rights of livelihood," Kenilorea said acidly.

But he did praise France for promoting equitable political and socioeconomic development in New Caledonia, which he said marked a step in the right direction toward islanders' right to self-determination, including independence.

Kenilorea did not refer to the situation in the French archipelago of Tahiti, unlike last year, but was unable to hide his irritation with what he termed France's "protectionist tendencies."

INDONESIA

Western Nations Criticized West for Lack of Assistance on Forest Fires

BK1110143691 Kuala Lumpur Radio Malaysia Network in English 1330 GMT 11 Oct 91

[Text] Indonesia lashed out at Western nations for ignoring appeals to help combat its forest fires which have created thick blankets of haze enveloping several parts of Southeast Asia.

Its foreign minister, Ali Alatas, criticized Western nations for being very quick at campaigning against logging but doing nothing to offer assistance in fighting the forest fires.

Speaking to newsmen at the end of the five-day Malaysia-Indonesia Joint Commission meeting in Kuala Lumpur, he said that Indonesia had asked Western nations for training and equipment in fighting the raging forest fires but so far none had responded.

He said he fully concurred with Datuk Sri Dr. Mahathir Mohamed's criticism of the West on this score.

The Malaysian prime minister had on Monday said while the Western world griped over the alleged uncontrolled felling of tropical timber to the extent of threatening to boycott timber exports, there was not a squeak about the forest fires now plaguing the region.

JAPAN

Government Urged To Take Initiative on Global Warming Treaty, UNCED

OW0310141191 Tokyo JIJI in English 1304 GMT 3 Oct 91

[Text] Tokyo, Oct. 3 (JIJI PRESS)—The House of Representatives Committee on the Environment Thursday unanimously adopted a resolution urging the government to take an initiative in concluding a treaty to combat global warming.

The resolution urged the government to take a leading role at the 1992 earth summit to consider the relationship between the environment and development that is slated to be held in Rio De Janeiro in June.

It also called for the conclusion of a treaty to set limits on levels of carbon dioxide emissions in advanced industrialized nations and international accord on the protection of tropical forests and endangered wildlife.

Government Approves Recycling Ordinance

OW1410061091 Tokyo KYODO in English 0429 GMT 14 Oct 91

[Text] Tokyo, Oct. 14 KYODO—Senior government officials approved an enforcement ordinance Monday that will oblige three types of industries to use recycled materials, government officials said.

The approval came at a vice ministers' meeting and will be formally adopted at a cabinet session on Tuesday, they said. The law will take effect October 25.

The enforcement ordinance obliges three industries—the construction industry, paper manufacturers, and the glasswork industry—to use recycled resources as part of their raw materials, the officials said.

The Ministry of International Trade and Industry and the Construction Ministry will be able to issue advice or instructions if they judge the rate of recycling to be too low, they said.

The government is planning to issue departmental orders setting the desirable recycling rate for the three industries by the time the law comes into effect.

The paper and glass manufacturing industries depend some 50 percent on recycled raw materials while the recycling rate for the construction industry is about 30 percent.

The ordinance urges the construction industry to recycle earth, sand, concrete, and asphalt, the officials said.

It also designates products such as cars, air conditioners, televisions, electric refrigerators, and electric washing machines as those which should use parts that can be easily reused and obliges the industries to make efforts to raise the recycling rate of the parts.

Cans containing drinks will have to have an indication of whether they are made of aluminum or steel to make it easier to collect them separately.

Surveys Show Dioxins Reaching Record Levels Nationwide

OW2110122291 Tokyo KYODO in English 1133 GMT 21 Oct 91

[Text] Tokyo, Oct 21 (KYODO)—Record concentrations of potentially carcinogenic dioxins exist in the nation's lakes and ocean, the Environment Agency reported Monday.

The report, based on the results of an agency fact-finding survey conducted in 1990, was submitted to a panel of experts on chemical substances of the central council for environmental pollution control.

Of 28 dioxins studied for the report, record high concentrations of the most toxic, tetrachloride 2,3,7,8 was detected in fish caught in Nagoya Bay.

Tests on sludge and bottom-dwelling fish and shellfish in 11 ocean areas and harbors, three lakes and swamps, and 11 rivers around the country showed widespread contamination from record concentrations of the chemicals.

The tests have been conducted since 1985.

The council said it does not consider the current dioxin levels pose a health threat, but warned that the situation warrants continued monitoring.

Tetrachloride 2,3,7,8 was found at Ise Bay near Nagoya port, Osaka Bay, and Suruga Bay off Shizuoka.

The highest concentrations of 5 ppt (one-millionth of a part per million) were in a mullet from Ise Bay.

Judged by the daily average consumption, according to the Ministry of Health and Welfare, of about 96 grams of fish, contamination at this concentration would only be harmful if a person weighing 50 kilograms ate more than 590 grams of fish every day.

However, compared to the 20-times stricter scandinavian standards, for example, it would take a daily intake of only about 30 grams of the fish to cause health problems.

Three of four places sampled in Osaka Bay yielded fish contaminated to levels of 2-3 ppt.

Suruga yielded a sea bass with 1 ppt for the first time.

Tetrachloride 2,3,7,8 was found in sludge in Tokyo, Osaka and Hiroshima Bays as well as kasumigaura lake in Ibaragi Prefecture and Suwa lake in Nagano Prefecture.

The highest concentration was 8 ppt in Osaka Bay.

Tetrachloride 2,3,7,8 was not found in shellfish, but relatively low toxicity dioxins such as tetrachloride 1,3,6,8 were found in shellfish in Tokyo Bay, Osaka Bay and the Kii channel between eastern Shikoku and Wakayama Prefecture.

The only place where dioxins were not found this time in either sludge or fish was the Kiso River which flows into Ise Bay.

Data from a survey the agency is currently conducting of areas surrounding paper factories is also due for release soon.

Meanwhile, a Tokyo Metropolitan Government Bureau of Public Cleansing Survey of seven garbage disposal plants in the city in 1990 shows a steep increase in dioxins being expelled into the air, indicating that contamination is not limited to rivers and ocean.

SOUTH KOREA

Prosecutor General Promises Strong Action on Environmental Cases

SK0810052891 Seoul THE KOREA TIMES in English 8 Oct 91 p 3

[Text] The law enforcement authorities have issued a stern warning that all those responsible for contributing to pollution, including government officials, will be placed under arrest and subject to heavy fines.

In a meeting with prosecutors handling environmental issues yesterday, Prosecutor General Chong Ku-yong said strong and legal action is needed at a time when the rate of environmental pollution is reaching new highs at every other end.

He said those found to be involved in illegally disposing of industrial waste, leaking hazardous substances into river streams and operating unauthorized discharge facilities must be arrested and interrogated without exception.

Industrial companies resorting to running unapproved discharge channels will be slapped with fines that are equivalent to the cost at which the facilities were installed.

Chong said fines for the violation of environmental regulations will be pushed up so that industrial companies will be more a wary of the implications of pollution.

As for government officials, they will face possible arrest if they are found to have accepted bribes, concocted reports or failed to act properly in official capacities, the prosecutor general said.

"The problem of environmental pollution has long passed the point where the law enforcement authorities must take it into their hands to ensure that corrections are implemented quickly.

He explained that the Prosecutor General's Office [PGO] had been taking a backseat in the crackdown on environmental crimes but the issue is too critical in the short and long term.

The PGO is set to initiate a first stage crackdown until the end of next month with the focus on habitual offenders and those who pollute the upper streams of the nation's water supply.

In addition, PGO personnel will be assigned to participate in environmental inspections at manufacturing companies as a means of keeping an eye on both inspection officials and industrial firms.

"One of the motives of the current crackdown is to prevent the sources of pollution building up to the point where little can be done such as the leaking of phenol into the Naktong River by Doosan Electro-Materials Co." the prosecutor general said.

The step by the PGO come amid reports from the Environment Ministry that a major position of the fines imposed on industrial companies violating environmental regulations has not been collected.

MALAYSIA

Foreign Media Said To Misunderstand Forest Policy

BK1410103691 Kuala Lumpur Voice of Malaysia in English 0600 GMT 14 Oct 91

[Text] Deputy Prime Minister Mr. Ghafar Baba has criticized certain sections of the media of having a policy of gaining wider readership by adopting an antiestablishment stand. They are so engrossed in making money that they become oblivious to national and international needs. This section of the media was suffering from [words indistinct].

Mr. Ghafar Baba said this when he opened the 28th Asia-Pacific Broadcasting Union general assembly in Kuala Lumpur today. He added that the foreign media was also suffering under a misconception about Malaysia's forest policy. He said they could live with so-called overexploitation of forest resources, but they did not take into account the fact that Malaysia has one of the best forest conservation programs in the world. Forests were cleared for specific reasons—settlement, agriculture, as well as (?industrialization). If the industrialized countries felt so strongly, then they should compensate the nation instead. [sentence as heard]

NEW ZEALAND

Ministers Debate Future Nuclear Power Options

BK1710095691 Hong Kong AFP in English 0824 GMT 17 Oct 91

[Text] Wellington, Oct 17 (AFP)—A government minister and another leading member of Parliament said Thursday New Zealand may be forced to consider nuclear power in the future.

But acting Prime Minister Don McKinnon promptly issued a statement saying nuclear power was not on for this country.

A commission of inquiry 15 years ago decided nuclear power would be uneconomic here, and six years ago antinuclear laws were passed prohibiting nuclear reactors.

Environment Minister Rob Storey however said Thursday he wanted the government to have another look at nuclear power. He said the pressure on energy resources was such that in 20 or 30 years time the nuclear option might need to be "viewed again".

The chairman of a parliamentary select committee, Warren Kyd, meanwhile warned that New Zealand's natural gas was running out, it was no longer acceptable to dam more rivers and Wellington was internationally obliged to reduce carbon dioxide emissions.

"There is really no easy source of fuel and I think we should once more evaluate nuclear energy to see if that might not be the best alternative," he told Radio New Zealand.

"By the end of the century we will have very safe nuclear stations which will cause less damage to the environment than any other source."

McKinnon's statement said the government remained opposed to nuclear electricity generation here. "That position and that policy remain unchanged," he said.

PHILIPPINES

Environmental Education Efforts in Philippines Noted

BK1510025091 Bangkok BANGKOK POST in English 15 Oct 91 p 6

[Text] Like some irresponsible fishermen in Thailand, fishermen in the Philippines have abused their natural resources through the widespread practice of destructive fishing methods including cyanide poisoning, dynamiting, and the use of trawl nets over coral reefs.

As a consequence, half of the country's rich coral reefs have been virturally destroyed—but this destructive trend is gradually being reversed thanks to the efforts of the Haribon Foundation, an active environmental non-governmental organisation.

Programme coordinator of the Community-based Resources Management Programme of the Foundation, Alexandro C. Ansula, yesterday told a panel of the International People's Forum of the Foundation's efforts and successes in reversing the trend in a portion of the fishing communities in the Philippines.

One of the fishing communities chosen by Haribon Foundation was on San Salvador Island in the Negros region.

Mr. Ansula said the Foundation had acquired a lot of information about the fishing community in San Salvador before sending its people there.

"Instead of telling the people to stop illegal fishing, we told them they could increase their income and simultaneously could help solve the environmental problems," he said.

He said a selected group of fishermen were taken for a trip to another fishing community in the Upper Island in the Luzon region which also shared similar problems—declining fish stock due to destructive fishing techniques.

The two groups had an opportunity to exchange views on fishing problems, he said.

"When they returned to San Salvador, they realised the need to do something," said Mr. Ansula, adding that the

fishermen were then given training, education and advice on alternative fishing techniques.

He cited the technique of using very fine nets as a replacement for the use of cyanide to catch tropical aquarium fish.

Techniques in handling fish and the ecosystem were also taught to the fishermen.

When it was discovered that their fish catch increased through the use of new techniques, the people no longer viewed resource management as a threat, said Mr. Ansula.

The people of San Salvador island have learned how to organise themselves for their own good and have their own cooperative, he added.

The Haribon Foundation has already pulled its men out of San Salvador, but still maintains contact with the community and remains a source through which people can seek consultation and advice.

But the Foundation's task to curb the practice of suing destructive fishing techniques is far from over.

Mr. Ansula said a similar approach would be applied to small illegal loggers in a bid to curb widespread illegal forest poaching in the Philippines.

THAILAND

20,000 Villagers Rally Against Government Park Plan

BK0910052991 Bangkok BANGKOK POST in English 9 Oct 91 p 1

[Excerpt] Samut Prakan—About 20,000 villagers from six tambons in Bang Kachao rallied at a school in Phra Pradaeng District yesterday to oppose the government's plan to expropriate their land and preserve it as a "lung" for Bangkok.

They asked that farmers, who constitute about 60 percent of the population, be allowed to stay in the area with state financial support to improve the land for agriculture and keep it green.

The villagers, waving banners opposing the plan, gathered at Wisut Kasattri School to hear explanations of Government policy on Bang Kachao from National Environment Board secretary-general Athon Suphapodok and his deputy, Santhat Somchiwita.

Some of them even said they would cut down all the trees if the land is to be expropriated.

Mr. Athon told them the Government adopted the plan because some of the land had deteriorated and yielded less produce every year, causing some villagers to sell their land to investors. The Government itself wants to buy the land with a minimal effect on villagers.

The National Housing Authority will be responsible for arranging housing for about 8,000 families to be moved from the area, he said, adding that densely populated communities, industrial zones and such faciliies as schools, temples and health centres will not be affected.

His explanation was greeted with shouts of disapproval.

Narong Ratsamithat, a villagers' representative, said investors who have bought about 40 percent of the land from the villagers are glad to cooperate with the Government. They will not be able to develop the land for resorts townhouses and other properties, so will be happy to resell to the state.

But villagers who still own their land will not cooperate, he said. [passage omitted]

Minister Scores World Bank for Postponing Loan for Pak Mun Dam

BK1710041191 Bangkok BANGKOK POST in English 17 Oct 91 p 1

[Text] Finance Minister Suthi Singsane yesterday criticised the "tyranny" of a few member countries on the executive board in forcing the World Bank to postpone the controversial Pak Mun Dam project.

During his speech on the second day of annual discussion, Mr. Suthi said further indecision would "truly endanger" the World Bank as a collaborative and effective institution.

His criticism of executive board members is the second this week by Thai officials. On Monday, the Finance Ministry's director-general of the Fiscal Policy Department, Niphat Phukkanasut, implied that an executive member from the United States had pressed for a postponement of the decision.

Most of the 22 board members of the World Bank are scheduled to visit the site of the Pak Mun Dam tomorrow to assess the environmental impact of the project.

Leading up to his criticism, Mr. Suthi said that in trying to balance "the needs of accelerating the supply of basic resources, such as water for irrigation and power to light rural areas, and creating new employment opportunities and their concomitant impact on the environment, Thailand firmly believes that these concerns must be carefully considered to avoid costly environmental rehabilitation measures and to ensure that adequate environmental safeguards are taken."

Because of these concerns, Thailand sought partial World Bank fianancing for the Pak Mun Dam project "to ensure that all adequate measures humanly possible would be taken to meet stringent international environmental standards, while simultaneously satisfyig the basic development needs of the Thai people."

"We studied carefully all aspects, including those that directly affected the human dimension. We are deeply disappointed that after lengthy considertaion of all the issues and conclusion of the loan negotiation, the board of executive directors did not properly take action in the normal World Bank manner.

"There are no legitimate reasons for the inexplicable decision to postpone the issue," he said. "It is a most dangerous precedent that the tyranny of a few in other countries prevails over membership rights, as well as logical and sound development objectives."

The cost of the project is minimal, he said. "But in this delay, its impact on future bank decision-making process and membership legal rights are considerable."

He said if the board and management through indecision and illegitimate concerns beyond membership critieria caused the bank to regress, its role as a collaborative and effective development institution will be endangered.

"We cannot and must not tolerate such an impasse," he said.

A senior bank official told the BANGKOK POST yesterday that originally the World Bank was scheduled to consider the Pak Mun Dam issue on October 10 but the decision was postponed because of concerns over environmental aspects of the dam by certain board members representing powerful developed nations.

The official said executive board members representing countries such as the United States, Germany, France, Canada and the United Kingdom were extremely sensitive to environmental groups and activists in their own countries. Although these members do not represent a majority on the executive board of directors, their influence is considerable. Developed countries provide most of the funding for the World Bank and the IMF.

The official said, for instance, that Japan has not made its position clear on the Pak Mun Dam issue. But if executive directors representing the developed countries still oppose or hold reservations, then Japan could abstain on the decision.

Although the board is due to visit the dam site tomorrow, it is uncertain when the issue wil be reassessed by the bank, the official said.

VIETNAM

Timber Exploitation Regulations Changed

BK0510151691 Hanoi Vietnam Television Network in Vietnamese 1200 GMT 29 Sep 91

[Text] According to the Ministry of Forestry, beginning from 1992 the ratification of annual plans for timber exploitation will be carried out on the basis of the four requirements to be met by various units and localities concerning exploitation plans, reafforestation plans, processing plans, and draft export plans.

In the past, this task was only based on project planning aimed at limiting irrationalities, thus creating loopholes in management. Along with changing the methods of ratifying timber exploitation plans, the Ministry of Forestry advocates the separation of the task of organizing timber exploitation from forestry sites.

All forestry sites will only be responsible for managing and counting trees and organizing the sales of trees according to the plans that have been ratified. Forestry sites will keep two-thirds of the value of the sale of trees for use in the development of production and management and protection of forests, while turning in the rest to the state budget in the form of natural resource tax in place of forest preservation money as at present.

REGIONAL AFFAIRS

Romania, Bulgaria Hold Environmental Talks in Giurgiu

AU0110210491 Bucharest ROMPRES in English 1543 GMT 1 Oct 91

["Communique of the Ministry of the Environment"—ROMPRES headline]

[Text] Bucharest ROMPRES—A Bulgarian delegation headed by Prime Minister Dimitur Popov met on September 30 in the Romanian Danube port of Giurgiu with a Romanian delegation led, in the name of the Romanian premier, by Minister of the Environment Valeriu Pop.

Romanian-Bulgarian relations were surveyed in the field of the protection of the environment and special attention was paid to the situation in the Giurgiu-Ruse area. The two delegations agreed that:

—A bilateral convention on the protection of the environment be concluded in Bucharest on 7-8 October 1991, when Dimitur Vodenicharov, the Bulgarian minister of the environment, pays a visit to Romania;

—The EC "PHARE" proposals be accepted of financial aid to solve the problems of the Giurgiu-Ruse area and the Romanian-Bulgarian border zone;

—A Romanian-Bulgarian governmental commission be created to survey the implementation of the measures and programs established.

On the occasion of Dimitur Vodenicharov's visit to Bucharest, joint programs of measures will be endorsed, together with their methodologies, regarding the Giurgiu-Ruse area.

The position was also discussed of the Bulgarian party expressed by the Bulgarian mass-media last week as concerns the pollution of the zone of Ruse. The Romanian party specified that the installations at Giurgiu did not work last week, and therefore the source of that pollution was not on the Romanian bank.

The Romanian minister of the environment will go next week to Ruse to present the position of the Romanian party as regards this issue.

Eurosite, Romania Sign Cooperation Convention To Protect Natural Zones

AU2110142991 Bucharest ROMPRES in English 1325 GMT 21 Oct 91

[Text] Bucharest ROMPRES 21/10/1991—A convention of cooperation was signed at the Eurosite annual conference recently held at Terschelling, Holland, between Eurosite, an international association grouping public and private bodies, that monitors European natural reserves, and the Danube Delta Biosphere Reserve of Romania, RDDB.

The convention stipulates the creation of a program of technical-scientific and cultural activities between the two bodies, intended to contribute to the preservation and protection of natural zones and to the development of the cooperation between EEC and Romania in the field of the protection of the environment. The three-year program of technical cooperation refers to the participation of RDDB to Eurosite work groups that elaborate administration plans, develop ecologic tourism, deal in wet areas and sea vegetation, the organising of grassing and field works etc. The program also aims at a better knowledge of local and national cultural traditions, of the purposes and actions aiming at the preservation of natural zones, with the support of French mass media, the participation of Eurosite experts to scientific researches on the Danube Delta flora and fauna.

BULGARIA

Green Party Calls for Boycott of Giurgiu Products

AU0210210891 Sofia BTA in English 2014 GMT 2 Oct 91

[Text] Sofia, October 2 (BTA)—The Green Party appealed to the pharmaceutical enterprises in Europe not to buy the output of the Giurgiu Combined Works until its operation is brought in line with the international standards. The appeal of the National Council of the Green Party, received at the BTA, points out that for ten years Ruse has been polluted by the Combined Works in Giurgiu and that all measures undertaken so far have proved inefficient.

National Assembly Adopts Environmental Protection Bill

AU0210132591 Sofia BTA in English 1241 GMT 2 Oct 91

[Text] Sofia, October (BTA)—Today the National Assembly adopted an Environmental Protection Act which regulates the collection of data on the environment and environmental control, as well as the rights and obligations of the state, of local authorities and of legal and natural persons with regard to environmental protection.

Under the act all persons and state and local bodies will be granted a free access to the environmental data which will be collected by the Ministries of the Environment, of Health and Agriculture. In case of environmental pollution, natural disasters, industrial accidents and fires the persons in charge should immediately provide the population with information and should take appropriate steps to restrict the harmful effects and eliminate the consequences. Under the act heavy fines will be levied for any violation of the principles of environmental protection ranging, the minimum fine being 15,000 leva. The fine for repeated offenses will be 30,000 leva.

The act was drafted and submitted to parliament by Mr. Krasen Stanchev, MP of Ecoglasnost. The draft has been approved by Western environmental experts at the Bush Centre in Budapest.

The idea about such an act was launched by the Ecoglasnost Independent Movement in 1989 and the first draft was presented at the Eco Forum in Sofia in 1989.

Faulty Kozloduy Nuclear Plant To Operate Barring Western Energy Assistance

AU1210164091 Paris AFP in English 0700 GMT 12 Oct 91

[Wolfgang Schweitzer report]

[Text] Sofia, Oct 12 (AFP) — Bulgaria will have to rely on electricity from its faulty Kozloduy nuclear power plant this winter unless the West provides energy to replace production from its most dangerous reactors, Deputy Prime Minister Aleksandur Tomov says.

The two oldest units of Soviet VVER-440 design of the mid-1970's provide between 10 percent and 12 percent of Bulgarian power, Tomov, Minister for Energy and Vice President of the Socialist Party, formerly the Communist Party, told AFP in an interview.

Professor Ivan Uzunov, a member of a governmental commission which this week published a damning report on management and safety at the plant, says that it must continue to operate during the winter.

Closure "would cause the death of many people, particularly among the elderly and young children because of cold and a shortage of food resulting from electricity cuts," he said.

Uzunov, of the Scfia University nuclear physics department, has studied emissions of radiation at the plant since it was opened.

He said that the probability of an accident at each reactor per year was one in 550. According to Western experts, the probability of a serious accident in Western plants are more on the order of one in 100,000.

Uzunov "prayed to God" that there was no accident during the winter because an incident "could cause serious contamination in the region, in the country and in Europe similar to that caused by the accident at Chernobyl." This was a reference to the April 1986 Chernobyl nuclear power station catastrophe in the Soviet Ukraine, which killed at least 31 people and sent a plume of radiation over much of Europe.

Tomov told AFP that he had written recently to the German minister responsible for the environment and safety of reactors, Klaus Topfer, offering to "close permanently" the two oldest reactors if the European Community and other European countries "compensated" Bulgaria for the loss of output.

The entire power station, sited on the Danube in the north of the country, comprises four 440-megawatt reactors of obsolete design and two more modern reactors each of 1,000 megawatts. Together they provide between 35 percent and 40 percent of national energy production.

The Vienna-based International Atomic Energy Agency (IAEA) wrote to Bulgarian Prime Minister Dimitur Popov in June warning that "until measures are taken to eliminate critical deficiencies, it would be imprudent to continue to operate the four first reactors."

Several breakdowns have been reported, but there has been no contamination outside the power station. IAEA experts said that they had noted "constant improvement."

Uzunov has said that while he supported nuclear energy at first, he was now against it. "Nuclear energy for Bulgaria was like communism," he said. "First it seemed a good thing, but later one realized that it was a catastrophe."

Bulgaria has had to import 70 percent of its energy materials, mainly oil and coal, although it is one of the biggest producers of uranium ore. Consequently nuclear power was a seductive solution, but subsequently costs to contain the danger posed by the station had risen out of proportion to the savings, he said.

Uzunov also asserted that 3,000 megawatts of potential in conventional power stations could not be exploited for want of spare parts and of technicians to carry out repairs. This was where the West should give priority help, he said.

Bulgaria has said officially that it will not build new nuclear plants and has abandoned a project at Belene on the Danube. But Uzunov alleged that subterfuge was being used to extend the atomic program as indicated by the recent creation of a "nuclear company" to promote nuclear energy.

CZECHOSLOVAKIA

Bohunice Radiation Release Traced to Water Pipe Leak

AU0110115691 Prague SVOBODNE SLOVO in Czech 25 Sep 91 p 3

[Unattributed report: "Exceeding the Limit"]

[Text] Bratislava—At the end of last week, the radioactivity concentration limit in the type A-1 Jaslovske Bohunice nuclear plant waste water was exceeded for a short period of time. Waste water

measured at the nuclear plant waste water control station was found to be in the range of 37 becquerels per liter (permissible limit) to 1,400 becquerels per liter. The overall radioactivity released into the environment reached 4,620,000 becquerels (A becquerel is a unit of radioactivity of material in which one nucleus disintegrates per second). It is assumed that the cause was a water leak in the fire-protection pipes in the area of the storage tanks located in the controlled zone of the type A-1 nuclear plant. Water leaked into the soil and loosened contaminated dirt in this area. The dirt got into the A-1 system of channels and, subsequently, into the environment. The leak represents 0.25 percent of the overall yearly limit imposed on type A-1 nuclear plants. At present, the situation is under control.

ROMANIA

Health Ministry Reports 181 Cholera Cases

AU0410113691 Bucharest ROMPRES in English 1000 GMT 4 Oct 91

[Text] Bucharest ROMPRES 4/10/1991—The Preventive Medicine Department of the Health Ministry announces that 181 cases of cholera were registered in Romania until October 3. By counties the situation is as follows: Tulcea - 124 cases (one death); Braila - 32 cases (one death); Constanta - seven cases; Bucharest city and Ilfov agricultural district - three cases; Arges - one case; Buzau - one case; Dimbovita - 13 cases (three deaths).

BRAZIL

Military Commander Defends Sovereignty Over Amazon Region

PY0910224591 Rio de Janeiro O GLOBO in Portuguese 8 Oct 91 p 8

[Text] During a seminar entitled: "The Brazilian Amazon" at the Army Command and Staff School in Rio de Janeiro, General Antenor de Santa Cruz Abreu, commander of the Amazon Military Command, stated yesterday that the Rio-92 [United Nations Conference on the Environment and Development] should be a meeting to discuss world environmental policy and not to teach Brazil what to do in that area.

Lecturing on the military presence in the Amazon to an audience of almost 700 people, the general said that there is almost no forest burning going on now. He defended the gold prospectors and criticized the international campaign that portrays the destruction of the Amazon, seeking to interfere with our sovereignty over the protection of that area. He added that he hopes that the Rio-92 Conference will not contribute with what he called the orchestrated campaign to publicize lies about the Amazon.

Military, Civilian Officials Decry 'Internationalization' of Amazon

PY1310001091 Sao Paulo O ESTADO DE SAO PAULO in Portuguese 11 Oct 91 p 5

[Excerpt] Rio de Janeiro—Former Army Minister General Leonidas Pires Goncalves stated on 9 October during a lecture at a symposium called "The Brazilian Amazon" that remarks made by Environment Secretary Jose Lutzenberger inspire him with "the same hatred felt for Communist Party Leader Luis Carlos Prestes." Pires Goncalves compared the defense of internationalization of the Amazon made by Lutzenberger in Europe in September to a statement attributed to Prestes: "In a war between Brazil and the Soviet Union, he would remain on the Soviet side." The symposium was sponsored by the Army Command and Staff School. It began on 7 October and ended yesterday.

Military officers, government officials, and national congressmen who participated in the symposium identified the existence of an international movement to end Brazilian sovereignty in the region, turning it into a "supposed asset of mankind." During the debates, concern over this matter was also expressed by Strategic Affairs Secretary Pedro Paulo Leoni Ramos, Amazon Military Region Commander General Antenor de Santa Cruz Abreu, Amazonas Governor Gilberto Mestrinho (PMDB) [Brazilian Democratic Movement Party], Deputy Atila Lins (PFL-AM) [Liberal Front Party - Amazonas], and Senator Aluizio Bezerra (PMDB-Acre).

Pires Goncalves expressed his fear that the UN Conference on Environment and Development (Rio-92) "will become a punitive session for Brazil." To avoid that, the former Army minister said that "fallacious theories on the Amazon must be neutralized." The general stated his belief that "the communications media are only producing facetious and baseless reports about the matter."

"Is it possible that a capuchin monkey is more important than a starving northeastern boy?" the general asked the audience, who applauded him. [passage omitted]

CHILE

Study Reveals Carcinogen Content of Santiago's Air

92WN0009A Santiago EL MERCURIO in Spanish 19 Sep 91 p C5

[Article by Lilian Duery]

[Text] Alarming, unanticipated scientific findings prove that, despite the measures adopted to reduce pollution, from April to June of this year the air being breathed in Santiago showed a higher toxicity level compared with the situation during the same period last year. The figures were even higher than those described in United States and European cities.

The observations producing these results were based on the action of chemical compounds with high risk to the population's health: agents capable of causing damage to the hereditary material in cells (mutagens), the vast majority of which can trigger a cancer (carcinogens).

This research, financed by the Fondecyt and the OAS , was conducted in the Environmental Contamination Laboratory headed by Doctor Lionel Gil, a unit affiliated with the University of Chile's School of Medicine.

At least 500 different chemical compounds have been identified in the particle material of the world's cities with a high degree of pollution. Fourteen of them have been identified in the air of Santiago by that laboratory, and six are classified by the World Health Organization (WMO) as carcinogenic agents. They are aromatic polycyclical hydrocarbons, among which benzopyrene is the best known, also being one of the components of cigarette smoke.

To study the mutagenic and potentially carcinogenic activity of these compounds, a series of samples was taken of the particle material coming from Station B of the MACAM Monitoring System of the Metropolitan Environmental Service, located at Plaza Italia. These extracts were added to bacteria in a culture for the purpose of measuring the genetic change in these strains. In some instances activator proteins were also added so as to resemble the metabolic response of the human being when these contaminants enter the body.

As a result, they discovered the presence of agents that are directly toxic and others that must be metabolized to be converted into mutagenic agents. In the case of the

latter, it is known that their conversion into a toxic substance or into innocuous compounds that are eliminated from the body depends on the genetics of each individual. Moreover, although there are mechanisms for self-repair of the genetic damage caused by these contaminants, their action is not always effective, and their capacity also varies from one individual to another.

Study in Human Cells

In cooperation with the Genetic Service of the University of Chile's Clinical Hospital, headed by Doctor Ricardo Cruz-Coke, an analysis was also made of the incidence of the contaminant extracts in human blood cells (lymphocytes). For this purpose, normal patients were carefully selected, while also selecting those who were neither alcoholics nor smokers, nor individuals subjected to medical treatment of any kind.

Contaminant samples were added to these blood cells in concentrations smaller than those causing death in bacteria. The results showed a high degree of damage in the chromosomes, where the hereditary information of each body is stored. That alarming chromosomic aberration was observed in cultures with or without metabolic action. This discovery means that Santiago's air contains compounds that can cause anomalies directly in chromosomes, or require prior activation to trigger the same effect.

Catalytic Converters

The mutagenic and potentially carcinogenic contaminants are found in the particles in suspension. Some of them have a diameter of less than 10 microns, and hence they can easily penetrate the respiratory tract. The main source of the emission of such particles is diesel engines (minibuses, small public buses, and trucks), which are responsible for 71 percent of their emissions.

The supply of unleaded gasoline starting next year in the capital will force the use of catalytic converters in cars, a measure that will reduce the emission of particle material to a large extent. Nevertheless, there are not yet any very effective devices of this type for diesel engines, inasmuch as they do not eliminate the nitrogen oxide content. This fact assumes particular significance if we consider that these compounds are combined with polycyclical hydrocarbons, both in the atmosphere and inside the engines. Their reaction results in direct mutagenic compounds in the human body.

In any event, the use of catalytic converters in cars will make it possible to reduce the probability of this interaction between contaminants.

As Professor Gil remarks, studies conducted in the United States indicate that gasoline engines without decontaminating devices emit between 0.5 and 85 micrograms of benzopyrene per km. On the other hand, those using converters emit between 0.05 and 0.3 micrograms per km of this hydrocarbon, recognized as a carcinogenic agent.

Situation in Santiago

Although it is difficult to extrapolate toxicity studies among different species, especially in the case of the effects of contaminants on human health, the professor claims that it is highly disturbing that the presence of direct and indirect mutagenic agents in the Santiago atmosphere has been established. He remarks that even more alarming is the fact that chromosomic aberrations in human cells due to exposure to these contaminants have been detected. Although it is true that various measures have been adopted to reduce the emissions, at least during the period from April to June of this year there was an increase in the toxicity of the extracts.

Considering the fact that damage to the genetic material increases with a larger concentration of contaminants, Doctor Gil stresses that the population's constant exposure to mutagenic agents heightens the possibility of mutations on the cellular level. Since such effects are cumulative in tissues, it will only be over the long term (20 or 30 years) that an evaluation can be made of the real damage caused by the toxic contaminants being breathed day after day in Santiago.

These results indicate that the situation in the capital is alarming, and that there is an urgent need to adopt measures within a short time to reduce the emission of toxic agents potentially posing a very high risk to the population's health.

It should also be noted that the studies made in Doctor Gil's laboratory indicate that there is not always a high correlation between particle concentration and toxicity. In other words, the biochemist claims that the air quality index does not include toxicological data. Hence, it does not fully reflect the dangers to the inhabitants' health. For this reason, it is important that an impetus be given in Chile to scientific research on environmental pollution problems of major significance to the country.

HONDURAS

Contamination of Yojoa Lake Described

91WN0746A Tegucigalpa LA TRIBUNA in Spanish 24 Aug 91 p 14

[Article by Norita Schauer]

[Text] In a report prepared after carrying out an investigation on Yojoa Lake, the Institute of Environmental Engineering of the Federal Polytechnical School of Switzerland stated: "The average contamination in sediment from the center of Yojoa Lake can be considered very critical."

At the same time several metallic substances were found to have been accumulated in fish, which were later analyzed. According to the World Health Organization (WHO), the presence of these substances could constitute a danger for human health if this kind of food is consumed to excess.

Yojoa Lake is the greatest reserve of fresh water in the country. It is located between the Departments of Santa Barbara, Cortes, and Comayagua. The greatest proportion of contaminant elements found in the lake are lead, zinc, copper, and cadmium, particularly in the center of the lake and at the mouth of the Raices river, according to the report.

The sample was collected two years ago under the direction of Swiss biologist Emmanuel Vevey. The report attributed the presence of the metallic substances to the influx of water from El Mochito mine in the municipality of Las Vegas in the Department of Santa Barbara, which is located on the principal river flowing from the lake.

The report on the control of the contaminants shows that until now the consumption of fish in small quantities from the lake has not presented any particular risk. This is because the majority of these heavy metals are still immobilized in the sediment at the bottom of the center of the lake.

Dr. Daniel Ramos, a specialist in bramatology (analysis of fish), warned in the same report that the accumulation of lead represents a risk because too much consumption of this metal could affect the blood, nervous, and kidney systems, causing anemia, symptoms of listlessness, violent abdominal pains accompanied by constipation, paleness, a slow pulse, and arterial hypertension.

In this respect the WHO specifies that some degree of these illnesses could be detected if a person consumed more than 1.5 kg daily of fish fillets, for the level of lead that the body needs would thereby be exceeded.

Apart from the large accumulation of metallic waste, which was detected in the waters and fish of Yojoa Lake located at 632 meters above sea level, this lake could be a focus of contamination in view of the prospective arrival of cholera in Honduras.

About 78 sources of raw sewage empty into the waters of the lake, as well as the garbage generated by approximately 10,000 families who live in its vicinity.

According to Carlos Fiallos Soto, the president of Eco-Lago (the Foundation for the Ecological Preservation and Development of Yojoa Lake and Its Basin), "the concentration of contaminants from human wastes is substantial, according to the preliminary figures that we have."

He explained that his organization has as its fundamental objective the ecological preservation of the area, the rational use of its renewable resources, and the orderly development of the lake and its basin.

Furthermore, Maria del Carmen Quan, an official of the Directorate of Sectoral Planning of SECOPT [Secretariat of Communications, Public Works, and Transport], stated that the government also has "assumed a role in the matter" to improve the area, satisfy health standards, and provide a better kind of living to the merchants involved in the sale of fried fish on the shores of the lake.

Quan explained, "The idea of the Project for the Improvement of Yojoa Lake began in SECOPT. At first this concerned regaining control of the right of way. However, when we saw the conditions at the lake, we decided to take the initiative to improve it."

Quan emphasized that the project has grown in scope, as the Ministries of Public Health, Natural Resources, and Culture, the National Agrarian Institute, and the Honduran Corporation for Forest Development (COHDEFOR) are taking part in it.

She indicated that the program for improvement of the area will begin in 1992 with the relocation of about 60 families residing between Pito Solo and La Guama, whose livelihood is basically derived from the sale of fried fish in the 47 booths along the shores of the lake.

The plan will cost approximately 2 million lempiras, since homes for the fishermen will be built in about 10 blocks of land, with systems of sewage and potable drinking water, which the Ministry of Public Health has insisted on.

In this respect local residents warn that they will not allow themselves to be relocated, "because on the mountain where they want to send us, no one will come to eat fish."

Miguel Angel Diaz, the president of the Board for the Betterment of the Commune of Pito Solo, explained that, "we are aware that we are among those who have contaminated the lake. However, we prefer to have sewage systems built right here, rather than to be moved up there."

In this respect Quan emphasized that the majority of the houses are built on stilts in the waters of Yojoa Lake. Therefore, it would be almost impossible to satisfy the requests of the residents of Pito Solo.

Yojoa Lake, which has a surface area of 89 square km, has also been the site of a merciless process of cutting down trees in the forests and basins of nearby streams and rivers. This has caused the almost total extinction of some animal species, such as the Toucan bird, monkeys, lizards, and otters.

Tourism in the area has also declined, as confirmed by Enrique Campos, the manager of the Motel Agua Azul.

The businessman emphasized: "We all have to educate ourselves on the rules of hygiene, because we are all responsible for the destruction of the lake."

Fiallos Soto said that Eco-Lago, the organization whose legal status is now in process, is negotiating an agreement with the Ministry of Natural Resources under which the foundation would manage whatever is related to the conservation of the area, the rational use of renewable

resources, reforestation programs, education, and the improvement of the living standards of local residents.

He considered that, "under the unhealthy conditions currently existing at the lake, the fried fish businesses will have to close down because they are not going to sell a single fish if cholera comes to Honduras."

He stated that Eco-Lago will watch to make sure that the promises of the government regarding relocating the residents of Pito Solo and La Guama are kept, in order to protect the people who regularly come to eat at the lake and consequently to improve the standard of living of its residents.

Regarding the basins of the contaminated streams, which empty directly into the lake, he stated that they will be cleaned up and protected.

The study recommends that, "because of the ecological, nutritional, and agricultural importance of Yojoa Lake, such a potential for contamination should not be permitted to continue to accumulate in the sediment at the bottom of this body of water."

The study presented by the Swiss Federal Polytechnical School concluded: "Pollution will become uncontrollable when the capacity for retention of wastes is exceeded. This is a situation that would be highly dangerous in terms of the sanitary quality of the lake and the consumption of fish."

This document is well known to the Eco-Lago foundation and governmental organization, which see an urgent need to protect the greatest reserve of fresh water in Honduras from progressive destruction.

NICARAGUA

Logging Destroying Western Nicaragua Windbreaks

91WN0745A Managua LA PRENSA in Spanish 12 Sep 91 p 22

[Article by Armando Quintero M.]

[Text] Leon—In western Nicaragua, 75 percent of the windbreaks have been destroyed by relentless logging, reported engineer Gustavo Zapata, regional director of IRENA [Institute of Natural Resources], in a recent speech he gave at the Rotary Club in Leon.

Of the 1,120 km of windbreaks grown in the past decade, only about 300 remain, he indicated.

According to official data, 400,000 cubic meters are used for firewood and 40,000 are used for construction each year.

The land in this region is losing 70 tons of topsoil per hectare annually. The normal rate is 12 tons a year.

To cope with this extremely serious situation, which in a short time could make us the Biafra of 1990, with devastating scenes of children starving for lack of food, some action is now being taken, including planting trees on 1,500 hectares in the municipalities of Telica and La Paz Centro, with the wood grown to be used for firewood.

At the present time one of the 500 varieties of eucalyptus, a variety suitable for dry zones as Nicaragua now is, is being planted here.

Birth of the Desert

Nicaragua's first desert has been born in the west. It is a 500,000-hectare area unusable for cultivation or any other activity. Attempts need to be made to regain this land in the long term through reforestation programs.

Gustavo Zapata, speaking to the Rotary Club audience, asked for the support of young people in planting 6 million trees at the rate of 2,000 to 3,000 per manzana, in order to make a stand against this growing desert.

An authorized source said that rational exploitation of wood yields a net profit of 2,500 cordobas or $500 per manzana, a much higher profit than could be earned from growing cotton.

PERU

Drug Trafficking Threatens Environment

PY1410202691 Lima EXPRESO in Spanish 3 Oct 91 Agricultural Supplement p 4

[By Ana Maria Mejia Rusconi]

[Text] An Andean Jurists Commission report states that the illegal activity of drug trafficking, from the coca crop to cocaine paste processing, represents a serious danger to the Amazon environment because it entails deforestation of the slopes, soil erosion, the contamination of rivers by chemicals used for cocaine paste processing, the use of herbicides and insecticides, and the possible use of agricultural chemical products to eradicate coca crops.

Ninety percent of Peruvian forest resources are concentrated in the mountain and valley jungle regions, where the coca plantations are located. The forests' destruction in this zone is causing damage to the flora and fauna that may become irreversible. Coca growers who migrate from the mountains and the coastal area cut and burn huge areas of forests.

Based on recent studies, Marc Dourojeanni reports that the deforestation, linked directly or indirectly to the coca crop, affects a total of 70,000 hectares, a process that began with the expansion of coca crops in the early 1970's. This represents an estimated 10 percent of the accumulated deforestation in the Peruvian Amazon this century.

The effects of deforestation are serious: loss of soil, extinction of genetic species, changes in the hydrological system, floods, and the lack of wood and firewood. The burning of the deforested areas contaminates the air, burns nutrients, and harms the layer of surface soil.

Erosion and Pollution

Coca is the most erosive crop of the Amazonian region because it should be planted on inclines. In addition, shrubs should be eliminated either manually or chemically, the soil should be scraped, and crops should be harvested.

In a study that he published in 1988, Carlos Ponce stated that pollution produced by coca crops is caused by herbicides—which are used for controlling shrubs, fungicides, and insecticides—which are used for controlling leaf-eating ants.

"Several studies have revealed that most of the fertilizers and pesticides used in the jungle go to coca crops."

When basic paste is being processed residues are thrown into rivers. Such residues are kerosene, sulphuric acid, carbides, lime, toluene, and acetone, which are toxic and dangerous to people.

According to recent studies, the following quantities of chemicals are thrown yearly into rivers: 57 million liters of kerosene, 32 million liters of sulphuric acid, 16 metric tons of quick lime, 3,200 metric tons of carbide, 16,000 metric tons of toilet paper, 6.4 million liters of acetone, and 6.4 million liters of toluene. These figures are based on an annual yield of 2,400 kilograms of leaves per hectare in 160,000 hectares in 1986.

The protected areas of the National System also have been affected because many of them have been invaded by coca growers, like Tingo Maria National Park and Abiseo River Park.

Government Signs 'Lima Declaration' on Environment, Sanitation

PY1010203691 Madrid EFE in Spanish 2353 GMT 5 Oct 91

[Excerpts] Lima, 5 Oct (ANDINA)—President Alberto Fujimori's administration and Peru's civilian society today expressed their solid commitment to strengthen the basic sanitary programs and environmental protection in keeping with the international agreements reached at the end of the century, and which includes the decision to fight the cholera epidemic in the Americas.

The document, known as the Lima Declaration, stresses that approximately $3 billion is needed to invest in sanitation and potable water systems in Peru during the current decade. This represents an yearly investment 10.6 times higher than that made during the last decade.

The document states that basic sanitation programs should be jointly implemented with actions to prevent damage to the environment as a result of the development and prevent health risks for current and future generations.

The government and civilian society will implement joint solidarity projects designed to carry out rational control of natural resources, especially the air, water, soil, and subsoil, in order to assure the well-being and quality of life for current and future generations.

They also will promote studies on epidemiology, toxicology, and on the environment and health impacts that can lead to the search for financing and implementation of projects that can minimize the health risks caused by development. [passage omitted]

The Lima Declaration was signed by Health Minister Victor Yamamoto, Housing and Construction Minister Guillermo del Solar Rojas, and representatives of several social assistance and health organizations.

URUGUAY

Creation of Southwestern Atlantic Fish-Exporting Cartel Proposed

PY0910233791 Montevideo BUSQUEDA in Spanish 19 Sep 91 p 41

[Excerpts] Uruguay has officially proposed the creation of a cartel of fish-exporting countries—similar to the way the Cairns Group operates in agriculture—to present a joint front to combat actions that seek to exchange access to the markets of developed countries for the opening of the over-exploited fishing zones.

Agriculture and Fishing Minister Alvaro Ramos made the invitation during the "Second Conference of Fishery Ministers," which was held in Pontevedra, Galicia.

Minister Ramos focused his proposal on two concerns: to preserve, during the medium and long term, the fishing resources that are at their maximum level of exploitation, and—in the short term—"to reject the initiatives of those who seek to trade off access to consumer markets for fishing resources." [passage omitted]

Diplomatic sources have reported to BUSQUEDA that the Uruguayan proposal was announced after consultation with Argentine, Brazilian, and Chilean officials "who are also concerned about depredation and the situation of the importing markets."

The proposal was officially made through a declaration by Minister Ramos and Uruguayan Foreign Minister Hector Gross Espiell on 27 November 1990. [date as published]

The idea of summoning coastal countries "as a starting point for this process of convergence" was outlined in the "Declaration on the Preservation of Fishing Resources in the Southwestern Atlantic Ocean Region."

It has been reported that the proposal will be extended to the countries of the Pacific Ocean whose fishing areas are suffering similar depredation processes.

VENEZUELA

Commission To Look Into National Environmental Cleanup Plan

92WN0011A Caracas EL NACIONAL in Spanish 15 Sep 91 p D-6

[Report by Marlene Rizk]

[Text] Drinking-water pollution and the disposal of garbage and toxic wastes are two of the issues that hastened the appointment of a bilateral commission that will look into the National Environmental Cleanup Plan. The Environment Committee of the Chamber of Deputies made this decision yesterday during its questioning of Environment Minister Enrique Colmenares Finol.

Carrying thick folders containing responses to 418 complaints that the Chamber of Deputies' Environment Committee processed in just one year (June 1990-June 1991), Colmenares Finol spent all of yesterday morning not only setting forth the achievements of his mandate but also answering all of the questions that the lawmakers put to him.

While the city was being plunged into veritable chaos by the closure of one of the main thoroughfares on which the anniversary of Democratic Action was being celebrated, the minister, the directors of his office, and members of the Environment Committee of the Chamber of Deputies and of the headquarters of Environmental Protection decided to appoint a bilateral committee to look into the National Environmental Cleanup Plan.

As the chairman of the Environment and Land Use Committee of the Chamber of Deputies, Ramon Martinez, said, in barely one year the committee has processed 418 complaints, most of them having to do with problems of contamination (22 percent), deforestation (18.6 percent), water (17.2 percent), land use (15 percent), soils (9.1 percent), and others involving the air, laws, projects, fauna, and mining. This meeting thus had to be called in order to reveal how the country's environment has been deteriorating.

Martinez said that 84 percent of the drinking-water infrastructure is contaminated and that 76 percent of the population lacks indoor plumbing; one of the results of this is that 622,000 children a year come down with gastroenteritis.

"Besides concerning ourselves with wildlife, that it to say dolphins and tortoises, we must not forget that our main environmental problem is the lack of basic sanitation in big cities and even in hundreds of small towns that do not even have systems for collecting and treating toxic waste."

Another of the aims of the National Plan is to clean up Venezuela's northern coastline, Lake Maracaibo and Valencia, the Trujillo Basins of Motatan, the basins of the rivers on the plains, the Turimiquire basins, and the Orinoco basins.

The first draft of a National Refuse Law will also be discussed, "because 246 mayor's offices in the country do not know what to do with their garbage." In Valencia, Cumana, Maracaibo, and other cities "waste disposal is a veritable disaster."

The plan also calls for discussion of the first draft of a toxic or dangerous waste law. "We have a highly developed oil industry and a metalworking industry that has not planned where it is going to put its wastes, and in Venezuela there are 3,000 pools of dangerous toxic wastes."

Another problem to which the plan will attach due importance is the preservation and decontamination of forest basins. "We are going to amend the Forestry Law of Soils and Waters, because the current one allows these resources to be exploited irrationally, and by amending Articles 53 and 54 we are going to make sure that unscrupulous hands do not continue handing out permits to exploit forest resources."

For his part the minister of the environment, Enrique Colmenares Finol, announced that in the medium term the administration of regional water-supply systems would be turned over to the mayors.

"We are overhauling the INOS [National Institute of Sanitation Works] precisely for this reason, because we saw shortcomings, among others the deterioration of the drinking-water system. The trend in the medium term is for the mayors to start administering the water supply in the country. We have given instructions to the regional enterprises to let the mayors become involved little by little, as in many areas of the world. But this will be possible when the overhaul is further along."

REGIONAL AFFAIRS

Israel Elected to Presidency of Mediterranean Ecology Body

TA0810153691 Jerusalem Qol Yisra'el in Hebrew 1300 GMT 8 Oct 91

[Text] Israel has been elected to the presidency of Mediterranean states' organization for environmental affairs, which is now convening in Cairo, along with Egypt, Tunisia, and Monaco. Yig'al Bibi, the head of the Israeli delegation, who is also the deputy minister of ecology and environmental protection, told our correspondent Shulamit Schmerling that the unanimous election of Israel shows that the member countries are aware of Israel's contribution to environmental protection.

The 18-country organization addresses environmental problems of the Mediterranean basin.

INDIA

Wildlife Protection Amendment Bill Passed

92WN0038A Bombay THE TIMES OF INDIA in English 31 Aug 91 p 9

[Excerpts] New Delhi, August 30. The wildlife (protection) amendment bill, 1991, which seeks to ban hunting of all animals and set up a central zoo authority to oversee functioning of all zoos in the country, was passed by the Rajya Sabha on Wednesday after the government narrowly escaped defeat during the voting on an official amendment.

The bill also provides for compulsory immunization of all livestock around sanctuaries, setting up of national parks and sanctuaries in the territorial waters to protect off-shore marine flora and fauna, curb on the collection and exploitation of wild plants facing extinction, ban on trade in imported ivory within the country and the lifting of the existing restriction on the extraction of snake venom for producing life-saving drugs. [passages omitted]

The statement of objects and reasons for the bill points out that the hunting of all wild animals (other than vermin) is proposed to be prohibited to check poaching and illegal trade of animal products. However, hunting of wild animals in exceptional circumstances, particularly for the purpose of protection of life and property, education, research, scientific management and captive breeding, would continue.

It is being made mandatory for every transporter not to transport any wild life product without proper permission.

Realizing the need to protect off-shore marine flora and fauna, the provisions of national parks and sanctuaries are proposed to be extended to the territorial waters. The interests of fishermen would, however, be protected.

To safeguard the interests of the local people and tribals, the bill provides that except for the areas under reserve forests (where the rights of the people have already been settled) and the territorial waters, no area can be declared a sanctuary unless the rights of the people have been settled.

Pointing out that there has been no law dealing with zoos which have mushroomed in the recent past, the bill provides for setting up of a central zoo authority responsible for overseeing the functioning and development of zoos in the country. [passages omitted]

Ministry Sets Deadline To Meet Pollution Standards

92WN0037A Calcutta THE TELEGRAPH in English 9 Sep 91 p 7

[Text] New Delhi, Sept. 8 (UNI): The environment ministry has fixed December 31, 1991, as the deadline for ensuring compliance of the pollution level standards by major polluting units.

The environment minister, Mr. Kamal Nath, has asked the states and union territories to ensure this in a letter addressed to all chief ministers, governors of Punjab and Jammu and Kashmir and lieutenant governors and administrators of union territories.

The letter from the environment ministry follows a recommendation from the estimates committee of Parliament that "the compliance of pollution control is to be ensured in respect of polluting industries."

Mr. Kamal Nath has pointed out in the communication that the increasing pace and complexity of industrial activity was leading to levels of pollution which were adversely affecting human health and causing serious ecological degradation.

"Thus, the quality of air, land, rivers and coastal waters of our densely populated country is under constant pressure from the very economic development which is supposed to improve the quality of life and our masses," Mr. Kamal Nath has observed.

IRAN

Effects of Air Pollution on Agriculture in Khuzestan

92AS0129X Tehran RESALAT in Persian 3 Oct 91 p 9

[Text] Air pollution is now being felt in the city of Ahvaz more than at any other time.

Smoke from the burning oil wells and installations in Kuwait on the one hand, and the existence of sources of air pollution in the area on the other, have increased air pollution in the city of Ahvaz, so that the amount of air pollution in this city has exceeded permissible standards.

The activities of several companies and factories polluting the environment, including 20 units with smokestacks, are exceeding the allowed limits for air emissions. Other elements playing a part in the air pollution of Ahvaz include 20 stone crushers and stone cutters, and brick kilns.

Likewise, gas produced in the extraction of oil from the numerous wells in the oil fields to the north of Ahvaz are having a great effect in increasing this pollution.

Black rain in the Province of Khuzestan and other cities in the nation, quite apart from the problems it causes for the people, has also brought losses to the region's agricultural crops, especially in the Azadegan Plain region. About 9,000 hectares of cultivated land in the Azadegan Plain region have been covered by black rain, leaving a relatively thin film of material on the soil, cultivated land and the agricultural crops and causing damage to the crops.

The effects from the burning oil wells in Kuwait on the various crops, including vegetables and summer crops, broad beans, wheat and barley are entirely evident in the Municipality of Behbehan.

The effects of black rain on pastures have been 100 percent undesirable, and according to the experts this will cause severe declines in production in coming years. It has been especially destructive on corn and alfalfa producing sites in cities such as Behbehan and Ahvaz.

Tehran Factories Required To Pay Pollution Control Fee

92WN0103A Tehran ABRAR in Persian 14 Oct 91 p 3

[Text] All factories and production workshops in the Province of Tehran are required to pay 0.1 percent of the production and service sale to be used for pollution control and to make up for the damages from pollution as well as create green areas.

The public relations office and the office of education of the central office of environmental protection of the Province of Tehran announced that this decision was made based on Note 13 of the First Economic, Social and Cultural Development Law of the Islamic Republic of Iran and also Article 13 of the executive bylaws ratified by the Cabinet. Accordingly, the production units in the Province of Tehran are required to calculate the determined percentage of their sales and services and deposit the amount in a separate account.

Timber Production To Increase in Northern Areas

92WN0103B Tehran ABRAR in Persian 20 Oct 91 p 9

[Text] The level of timber production in the forests of the northern part of the country will increase to 4 million cubic meters annually by the end of 1372 [20 March 1994], and in the implementation of the transfer projects of the forests this year, more than 200,000 hectares of forests in the northern part of the country will be transferred to the owners of industries and the private sector. In this connection, in addition to the imposition of government policy, with the investments by the private sector, the volume of forestry production will increase and the grounds for the creation of jobs on a large scale will be prepared for the oppressed people of the region.

According to IRNA, the total potential production of the forests in the northern part of the country, under proper management and revitalization of the destroyed forest areas and also by making use of advanced technology, is estimated at 10-12 million cubic meters annually. The commercial forests in the northern part of the country at the present time cover an area of 1.9 million hectares. So far, for about 1.1 million hectares of it, an implemental project has been prepared. Timber production from the forests in the northern part of the country last year was 1.7 million cubic meters. This figure is expected to increase to 2.3 million cubic meters in 1370 [21 March 1991-20 March 1992]. At the present time, 700,000 hectares of the prepared implemental projects are active, and a large portion of the implemental projects is being transferred to the private sector and the forest-dwelling cooperatives. In the continuation of this interview, Fallah referred to the programs of the National Forestry and Pastures Agency as well as forest planting and the creation of green belts and pointed out: The level under forest planning before the Islamic revolution was 43,000 hectares annually and since the victory of the Islamic revolution, 160,000 hectares. But this future this year will reach 100,000 hectares. According to Engineer Fallah, the level of production of saplings this year is 140 million, of which 20 million will be produced by the private sector.

New Environmental Research Center To Work on Caspian Sea Pollution

92WN0103C Tehran ABRAR in Persian 21 Oct 91 p 8

[Interview with "Abedini," deputy financial director of the national environmental protection agency, by IRNA; date and place not specified]

[Text] With the allocation of 470 million rials in funds from the national projects funds, the implemental operation of the center for environmental research of the west of Mazandaran began in Chalus.

With the equipping of this center, experts and researchers will be active in the areas of microbiology and the pollution of the air and waters of the Caspian Sea.

"Abedini," the deputy financial director of the national environmental protection agency, said in an interview at the end of these ceremonies, that by the end of the first five-year plan, 10 billion rials in funds will have been spent on the creation of 14 large environmental research projects throughout the country.

He said that, in addition, with 2.5 billion rials in funds, four environmental research and study centers will be completed and put into operation in the Provinces of Eastern Azarbaijan, Khorasan and Fars by the end of this year.

Referring to the statement that the environmental protection agency completes and perpetuates the development of economic activities, he emphasized the importance of teaching the people about protecting the environment.

It is worth noting, according to studies conducted by the environmental agency of Mazandaran, that because a sewer processing system is not used, ten factories in the province of Mazandaran alone, every 24 hours more than 15,830,000 liters of raw sewage and waste water is poured into the Caspian Sea.

Also, annually, more than 20,000 kg of various kinds of pesticides, which ultimately play a significant role in the destruction of the environment and pollution of the coastal waters of the Caspian Sea, are used in the agricultural lands in that province.

IRAQ

Environmental Pollution Blamed on U.S. Air Attacks

JN0510132491 Baghdad INA in Arabic 0834 GMT 5 Oct 91

[Text] Baghdad, 5 Oct (INA)—The Environmental Protection Center of the Health Care Department at the Ministry of Health has held the United States and its allies in aggression responsible for the environmental pollution which has affected all aspects of life in Iraq.

Head of the Center Doctor Muthanna al-'Umar said in a seminar held to discuss the direct and indirect effects on the environment of the aggressive air attacks on Iraq. The direct effects were caused by the direct attacks on electricity generating plants and water treatment plants, both drinking water and heavy water [al-miyah al- thaqilah]. This caused sewage systems to flood, and untreated waste water to flow directly into rivers.

He added that the indirect effects are due to the destruction and stoppage in operation of water pumping stations caused by cuts in electrical power. This led to an increase in the arid regions in the country, which, in turn, led to higher incidences of dust pollution recorded by measuring stations at the center. He noted that agricultural land had been transformed into semi-desert because of cuts in water supplies and the erosion of solid top soil. This greatly increased the possibility for dust to fly around in certain weather conditions.

Engineer 'Abd-al-Karim Wahid, director of the section for examining air pollution, said the Center's readings of the percentage of solid particles in the air during the four months after the aggression as measured by the air pollutants' measuring station in Baghdad indicated a huge difference in the monthly average concentration of particles in the air when compared with past years. In March, there were eight sandstorms; in June, there were more more than five; and in July there were four. The dust concentration exceeded certain limits to reach over 700 micrograms for every cubic meter of air.

He explained that since citizens throughout the country needed fuel during and after the months of the aggression, and, as a result of the bestial and hostile air raids on Iraq, trees were cut down or destroyed. This led to breaking up the top soil and increasing the area of dry land in the districts in and around around Baghdad, and in the north of Iraq.

He added that the Environmental Protection Center will conduct a study on people with chest diseases such as asthma and allergies to prepare statistics on the increasing percentage of people with these diseases as a result of environmental pollution and the difficult and harsh circumstances of the siege.

Engineer Fatin Subhi 'Aziz, head of the division for monitoring surface and ground water, has affirmed that the percentage of pollution in drinking water is high compared to previous years. The aggression destroyed water treatment facilities, and water distribution networks were ruined as a result of the raids, which severed the water pipes. Water leaked out of the pipes and became polluted from other sources.

She added that all Iraq's governorates suffered from this pollution, especially Dhi Qar, al-Qadisiyah, al-Najaf, Karbala', and al-Basrah. The pollution level exceeded 50 percent. The Diyala Governorate is still suffering from very high pollution levels, and so is al-Sulaymaniyah, where levels have exceeded 50 percent.

She explained that the countries of the aggression deliberately shelled the phosphate factory's production units and storage facilities. This allowed chemical substances to flow directly into the river, and the pollution had a clear effect on marine life. In the Governorate of Wasit dead fish floated to the surface and heavy water flowed untreated into the rivers.

Engineer 'Abd-al-Karim al-Siraj, deputy director of the Center, noted that damage directly affecting the heavy water treatment plants or some of the treatment stations' pipelines resulted in untreated human and industrial waste being pumped directly into rivers. The al-Rustumiyah plant in Baghdad and the treatment plants in al-Muthanna and al-Najaf were subjected to direct hits, thus bringing operations to a halt.

'U.S.-Zionist Aggression' Blamed for Destruction of Agricultural Land

JN0810195191 Baghdad INA in Arabic 1805 GMT 8 Oct 91

[Text] Baghdad, 8 Oct (INA)—The U.S.-Zionist-Atlantic aggression has had a serious ecological effect on the green areas of Iraq.

A responsible source at the Environmental Protection Center has said the U.S.-Zionist-Atlantic aggression against Iraq has led to the destruction of 1,965,048 dunoms of agricultural land in Iraq. The fact that stations pumping water for agricultural use had stopped operation due to the destruction of electricity generation stations has led to a reduction of approximately 5,905,382 dunoms of green areas, which are estimated at 19,161,652 dunoms, he added.

The source explained that the ecological effects are demonstrated by a reduction in green areas; growing desertification, particularly in the western areas of central and southern Iraq; reduced productivity of the land due to shortage of fertilizers and the seepage of carbon dioxide, which resulted from explosions, into the soil and its dissolution in rivers and water catchments; as well as the rise in ambient temperature due to the reduction in green areas and the increase in wind speed, and the weak plant growth because of black rain.

The source urged the international agencies concerned with environment, including the United Nations Environment Program, to seek to lift the embargo imposed on Iraq and support Iraq's efforts to face the serious ecological consequences resulting from the U.S.- Zionist-Atlantic aggression against Iraq.

MOROCCO

Ocean Fisheries Minister on Strategy for Exploiting Fish Resources

92AF0009Z London AL-SHARQ AL-AWSAT in Arabic 10 Sep 91 p 10

[Interview with Bensalem Smili, minister of ocean fisheries and merchant marine, by Atahami Ben Azouz; place and date not given]

[Text] Rabat—There are enormous fish resources along Morocco's 3,500 km of coasts on the Atlantic Ocean and Mediterranean Sea. Moroccan sovereignty now extends over more than 1 million sq km of sea, after the range of territorial waters was extended to 200 miles. This development required a strategy to optimally exploit Morocco's fish resources. The most salient foundations of this strategy include the establishment of a special ministry concerned with the maritime sector, the development of the capabilities of Morocco's fishing fleet (currently the leading maritime fleet among the Arab and African countries), and the curbing of illegal fishing operations by foreign fleets. In an interview with AL-SHARQ AL-AWSAT on the future of Morocco's fishing industry, the Minister of Ocean Fisheries and Merchant Marine, Bensalem Smili, stated that the agreement between Morocco and the EEC emphasizes Moroccan sovereignty over the fish resources in its territorial waters and the treatment of these resources according to the principles of the law of the seas. He indicated that the agreement defines the activity of European fishing fleets and the monetary compensation to be paid to Morocco by the EEC in exchange for permission for its boats to fish in Moroccan waters pursuant to specific terms. The following is the text of the interview:

[Ben Azouz] The fishing yield in Morocco increased last year by 6.71 percent compared to the previous year, from about 529,000 tons in 1989 to about 564,000 tons in 1990, and the value of the fish yield increased by 19.9 percent, from 2.974 billion dirhams to 3.567 billion dirhams.

About 172,000 tons, or three percent of total production, were channelled into the domestic market. Exports of fish products jumped sharply to about 187,000 tons worth $540 million. What are your estimations regarding production and exports this year?

[Smili] It is difficult to make estimates in the fishing industry, which is influenced by a number of natural and biological factors, especially given that coastal fishing accounts for 75 percent of the yield. Nonetheless, production during the first four months of 1991 increased by 11.6 percent compared to the same period last year. The value of production also increased by 18 percent.

Exports are expected to grow substantially, especially in light of contacts to export Morocco's fish products to new markets.

[Ben Azouz] What measures have you taken to safeguard fishing resources in Moroccan territorial waters, especially against depletion and coastal pollution as a result of certain fishing methods?

[Smili] Our method is to achieve a balance between the fish reserves and the volume of exploitation through several measures to regulate fishing grounds and support coastal monitoring capabilities. Also, violators are subject to severe penalties. For example, we have increased the fines for violations of directives regarding fishing nets, fishing in prohibited areas, and catching small fish not on the commercial list. It has also been decided that three marine surveillance planes will begin regular survey operations of territorial waters toward the end of this year.

Briefly, our efforts to counter pollution include: the monitoring of fishing operations; supervision by specialized committees over fishing grounds; and a requirement that certain documents be obtained to engage in fishing operations, such as an international safety certificate and insurance policies. Regarding the new maritime law, we are seeking to organize a legal agency to protect ocean

waters from pollution caused by boats. Also, the administration is making efforts to counter the effects of pollution on fishing grounds and protect the fish reserves in Moroccan territorial waters. We have decided to establish a center to monitor the Strait of Gibraltar in support of scientific efforts to fight pollution. There is also an intensive program for cooperation among the countries on the Atlantic and Mediterranean to counter the dangers of pollution in the region.

[Ben Azouz] Could you discuss plans for channeling production to processing? What measures have you taken to intensify the introduction of modern equipment?

[Smili] The maritime resources processing industries in Morocco are participating effectively in developing the country's economy. Their products enjoy an international reputation for quality based on Morocco's substantial experience in this field. In general, the products of these processing industries must meet international quality standards. These products have the merits of the Moroccan trademark, which is distinguished internationally by virtue of our continuous quality control operations.

The ocean-fishing fleet provides industrial units with 60 percent of their total annual production. About 37 percent of the coastal fishing yield is made into fish powder and oil, 21 percent is canned, 1.4 percent is frozen, and 0.6 percent is salted.

State agencies and private-sector organizations are striving to increase production while maintaining quality. Various concerned parties intend to increase the production of industrial units that have failed to utilize their full design capacities for a number of years due to the seasonal nature of coastal fishing and related industries. In this connection, factory owners have been encouraged to furnish their plants with refrigeration equipment to enable them to store fish, so that production can continue throughout the year.

In addition to the fishing industry's distinguished role in providing food, it also provides many jobs and hard currency.

[Ben Azouz] What are the most salient features of the new cooperation agreement on ocean fishing between Morocco and the EEC, and the Moroccan-French protocol on ocean fishing?

[Smili] The principles of the agreement between Morocco and the EEC stipulate the affirmation of Morocco's sovereignty over its fish resources and the treatment of these resources based on the principles of the law of the seas. This agreement, which calls for reducing the foreign ocean fishing effort, sets the terms for the activity of European fleets, demarcates fishing zones, and determines the distance separating the coasts from fishing zones. The agreement also stipulates the cessation of fishing operations for one month each year, so that mollusks and some fishes can proliferate.

In exchange, the EEC is providing compensation to Morocco, which includes fishing rights worth about $120 million per year, the exemption of 17,500 tons of Moroccan fish industry exports from customs duties, and the provision of about 800 jobs for Moroccans in European fishing fleets, so that Moroccan fishermen can enhance their expertise.

[Ben Azouz] Have relations with the ECC countries extended beyond commerce to include investment partnerships?

[Smili] Morocco is making efforts to implement a number of projects under fishing agreements, such as the equipping of several ports, the financing of fishing projects, the transfer of European technology, and the support of joint companies.

State investments pertain only to the establishment of infrastructure, such as ports, and to projects that the private sector cannot implement. The private sector and joint companies with foreign partners are concerned with ocean fishing and related industries. For your information, the property of companies that were subordinate to the Moroccan Fishing Bureau before the creation of a pertinent ministry has been transferred to the private sector.

[Ben Azouz] What are the prospects of a partnership with the Soviet Union? How successful is the surimi product experiment with Japan?

[Smili] The agreement that Morocco ratified with the Soviet Union specifies aspects of cooperation in the area of ocean fishing and the practical terms that must be met by Soviet ships when fishing in Moroccan waters off of the Atlantic coast. It provides for cooperation between the two parties to control the exploitation of fish resources based on the principles of the law of the seas (the Treaty of 1982). It also stipulates that Moscow shall support scientific research efforts pertaining to fish resources in Morocco, develop conditions for the exploitation of these resources, train advanced fishing cadres, and exchange technical expertise and equipment. In addition, under the agreement, Soviet fleets are required to give 15 percent of the value of the fish they catch [in Moroccan waters] to Morocco in hard currency.

The agreement sets a ceiling on the catch during the first year at about 750,000 tons, in addition to 100,000 tons to be channeled to mixed companies. In the fourth year, the catch will be limited to only 450,000 tons, but it will increase for mixed companies to 150,000.

The Soviet Union will provide two boats to the Moroccan Scientific Institute for Ocean Fishing and three boats to the Vocational Training Center for instructional purposes. The agreement also provides for the opening of new markets for sardines and the direct supply of fish to canning factories, and it permits the export of canned sardines to the Soviet Union under a preferential system.

Regarding the surimi experiment, which is a cooperative effort with Japan, the surimi factory, which cost 17 million dirhams to build, is a model unit considered the first of its kind in Africa and the Arab world.

Surimi is a paste extracted from fish meat. Sophisticated Japanese techniques are used to process it into products with substantial nutritional and commercial value that are used to prepare ready-made foods borrowed from the Moroccan kitchen, which are made from the sardine catch. Oil and fish powder are also extracted from a portion of the sardine catch.

This method will help diversify Morocco's processed fish products, especially with respect to bluefish, which is found in abundance in Moroccan waters. The surimi industry will reflect positively on producers and fishermen and will strengthen Morocco's export capabilities.

[Ben Azouz] What are the biggest problems facing the shipping sector in Morocco? What are your plans to cope with them?

[Smili] Maritime transport handles about 98 percent of Morocco's total foreign trade. Despite intense competition from foreign fleets, the Moroccan fleet's share of this transportation activity has increased to about 34 percent, compared to no more than two percent in 1973.

The development of the maritime shipping sector in Morocco is based mainly on encouraging exports through favorable pricing policies, expanding the network of lanes to include regular lanes to new markets, increasing the country's hard currency income (maritime transport represents about 10 percent of the total value of Morocco's foreign trade), and creating new jobs.

The ministry maintains direct, ongoing contacts with maritime transport workers to ascertain problems impeding the growth of the Moroccan fleet, so that the appropriate measures can be taken to solve them. Despite the recent shocks and developments in the international arena, the Moroccan fleet has been able to maintain its foreign trade activity, especially regarding several strategic Moroccan exports, such as citrus, early vegetables, and phosphate products, in addition to general freightage on regular lines.

The maritime transport sector in Morocco is characterized by openness to the world in a climate of free competition between Moroccan companies.

[Ben Azouz] What are the main results of the Senegal conference on ocean fishing?

[Smili] The conference, whose eighth session was held in Senegal last month, examined cooperation projects that a number of parties have agreed to finance, including an inventory of African member countries' fishing capabilities and the establishment of a regional maritime information bank.

Agreement was also reached on implementing cooperation projects over the next two years with the participation of international organizations in the area of preparing and developing fishing grounds and developing fishing industries, in addition to cooperation on maritime laws and monitoring. The conference called upon the UN Economic and Social Council [UNESCO] to help the African countries on the Atlantic Ocean develop their fish resources and counter illegal fishing.

Study Details Effects of Industrial Growth on Environment

92WN0010A Rabat ALMAGHRIB in French
20 Sep 91 p 3

[Unattributed article: "The Negative Effects of Economic Activity on Environment in Morocco"]

[Text] According to a study presented last week by the Moroccan delegation to the Arab ministers' conference on environment and development, Morocco's progress in recent years, in the various economic and social sectors, has had negative effects on the land, aquatic, and atmospheric environment.

These effects, according to the study, fall into four pollution categories: industrial pollution, household waste, abusive use of phytosanitary products and chemical fertilizers, and, last but not least, ocean pollution.

The first form of pollution, limited in space, results from the plants rejecting waste products into the air, the ocean and the rivers, in violation of environmental protection regulations. This form of pollution affects the Casablanca-Kenitra industrial corridor.

According to the study, some industrial plants have made only insignificant efforts to acquire antipollution equipment, which prompted the government to take a series of protective measures, in particular the creation of a global program designed to confine industries to well-defined urban areas. This program is part of the policy of national and regional development and protection against pollution and industrial nuisances.

The program classifies industries in three categories, depending on the quantity and noxiousness of the waste products they reject in the environment. The government uses this classification to control industrial plants in order to force them to comply with antipollution standards. This control starts already when the dossier pertaining to the plant creation is constituted and it continues when the plant is in operation.

Concerning household waste, the study shows that, in spite of the sanitation systems that exist in most towns, problems persist in some of them, and some of these systems have only outdated waste-disposal means.

To find adequate solutions to these problems, the people concerned have devised several projects to benefit local communities, and a ministerial commission and other

local commissions on waste collection have been set up to consider all environmental problems.

In addition, the study goes on, the government is preparing a global and detailed study of waste waters, and it has designed a program to equip all urban centers with sanitation systems and water-processing stations.

As for the abusive use of phytosanitary products and chemical fertilizers, the study estimates that their use in Morocco is still limited, compared with other countries.

Finally, concerning the ocean pollution that threatens the fishing resources with extinction, the study points out that, because of its geographic position—with the Mediterranean to the north and the Atlantic to the west, plus Gibraltar, which constitutes a passageway for the world's ships and oil tankers—the Kingdom of Morocco is expanding many more efforts to protect the environment, in particular through rational utilization of its fishing resources and through the promulgation of laws in this respect.

As far as the fight against oil-caused pollution is concerned, the study indicates that Moroccan authorities have completed a technical study for the creation of a national center to control this form of pollution, which comes in addition to their effective participation in the efforts made to protect the Mediterranean.

NEPAL

Environmental Threat to Himalayas Assessed

91WN0740A Moscow AZIYA I AFRIKA SEGODNYA in Russian No 7, Jul 91 pp 58-60

[Article by Dm. Kostinskiy: "Nepal: The Himalayas in Danger"]

[Text] *Just 30 or 40 years ago Nepal was famed for its untrammeled, virgin natural environment. High, forbidding mountains blocked routes into the country's interior. At that time human beings had not yet set foot on their eight-km-high summits. There was not a single modern highway, not even between Kathmandu and the outside world. The ban on visits by foreigners to the country imposed by the authorities was just as serious a barrier as natural obstacles. There was a reason why Western authors of the time called Nepal a country behind seven seals. Now Nepal is visited by thousands of tourists annually. It seems that mountaineers from everywhere in the world are coming to set off on expeditions into the Himalayas. There is no way that this could occur without having an impact.*

In the late 1970's and early 1980's the press and the public began sounding the alarm. The Himalayas, the highest mountain range in the world, were threatened by a worsening ecological crisis. In just 50 years one-half of its rich forests had been denuded. Of that deforestation two-thirds has occurred in the past 15 years. As a result there has been a marked increase in erosion on mountain slopes. Each year 240 million cubic meters of soil cover are washed away. The sediment is carried away by rivers, causing silt to clog their channels and river bottoms to rise by 15-30 centimeters each year. This causes catastrophic flooding not only in Nepal, but also in the valleys of India, Pakistan and Bangladesh, into which Himalayan rivers flow.

Snow melt and tropical downpours, filtered by the forest vegetation of the Himalayas, feed the great rivers of South Asia, the Indus, the Ganges and the Brahmaputra. Yet over the past 15 years due to massive deforestation swift high waters not restrained by a forest barrier have caused terrible natural disasters. The number of floods in the region has increased since the 1950's by a factor of 14. The powerful water flows sweeping over deforested mountain slopes wash all nutrients out of the soil. Many peasants have been forced to abandon their farms when they become infertile. Something which nature created over centuries is being destroyed in a matter of years, within the lifetime of a single generation. Disruption of the ecological balance in the Himalayan environment is especially dangerous due to the fact that it leads to disruption of the normal cycles by which water resources are renewed throughout the entire South Asian subcontinent.

Thus Nepal's ecological problems are international in nature. In 1980 at the recommendation of the Nepalese Government UNESCO announced the inclusion of unique natural regions of the Nepalese Himalayas in the list of world heritage areas for the purpose of preserving their pristine condition forever.

Population Pressure on the Land

Why has the ecological situation changed so markedly in the country, and why has Nepal's flourishing natural environment been replaced by a degraded one? There are several reasons. One of them is rapid population growth. Nepal, like other developing countries, is characterized by a "demographic boom" which began in the 1950's. In one-third of a century its population has risen from seven million to 18 million.

Nepal's territory is not that small; it covers 140,000 square km. Based on the average population density—10 persons per square km—it seems relatively sparsely settled. However, this average figure does not reflect the true demographic situation. Nepal is an agrarian state, 95 percent of whose inhabitants engage in agriculture. Consequently, in order to determine the true population density one must consider mainly the land area which can be used as cropland and pasturage. The non-arable steep, rocky slopes and the snow-covered peaks are uninhabited. Nepal's average agricultural population density per square km of cultivated land was 250 in the mid-1980's. This figure is higher in the medium-altitude mountains (410), and particularly so in the high mountains (590).

Due to unfavorable conditions for agriculture only 3.4 percent of Nepal's cultivated area is located in its high-mountain zone, which occupies 35 percent of its territory. In the medium- and high-altitude mountains there is an acute shortage of arable land. Yet the population there continues to grow steadily. One peasant in three in those areas does not have land. When land is divided up among heirs fields become so fragmented that they become unprofitable to cultivate. Therefore a majority of young people are forced to leave their native villages and move to other places, or move to Kathmandu, the capital of Nepal and its single major city, or go to India in search of jobs.

Just a few decades ago a potential region for agricultural development were the *terai*—a narrow (20-40 km wide) belt of foothill valleys between the Sivalik Mountains and the Indian border. But at that time the greater portion of this belt was covered with malarial swamps and impassable jungle. Over the past two or three decades the *terai* have seen construction of irrigation canals, draining of the malarial swamps, clearing of jungles and construction of a highway. Many landless peasants from the mountain regions settled on the newly developed land. By the mid-1980's the drained land of the *terai* was already largely populated.

Landscape Degradation

What can one say about the medium-altitude mountain zone? There peasants have been using every tiny parcel of land to cultivate crops for ages. Artificial terraced fields made by many generations of Nepalese are carved into mountain slopes of up to 45 degrees. They carried soil for the fields from the valleys in woven baskets, descending and bringing back their heavy burden innumerable times. In recent decades the peasants, driven by lack of land, have been forced to convert many forests and pastures into cropland, and this has caused landscape degradation.

It would seem that the worsening ecological situation would affect the high mountain regions least of all. Unfortunately the inaccessibility of the mountains, formerly a serious barrier which helped preserve the original natural environment, has now become an attractive stimulus for foreign tourists and mountain climbers who dream of visiting a country of untrodden paths.

The tourist pilgrimages began in the 1960's. Now Nepal is visited by 250,000 foreign visitors annually. A substantial number of these visitors set out for the High Himalayas. The Kkhumbu region alone, at the base of Sagarmatkha (Everest) is visited by 5,000 people each year. Foreign tourism provides 40 percent of Nepal's national income.

But the massive mountain tourism has its negative side as well. It places a very large ecological burden on the environment, causing substantial damage. An average two-month mountain climbing expedition uses 56 tons of firewood. During the periods of most intensive mountain tourism (October-December and March-May) grassy vegetation along all the tourist paths becomes heavily trampled. The main tourist route, which leads from Kathmandu to the foothills of the High Himalayas at Namche-Bazar, has become a virtually unbroken swath of garbage. The Nepalese authorities are currently considering a plan to clean up polluted areas and utilize the waste materials.

Naturally, through active economic activity the local inhabitants also contribute their share to the disruption of the high mountain region's ecological balance. The 4,500 Sherpas who lived at the base of Sagarmatkha in the Kkhumbu region came there from Tibet in the 16th century. At that time the area was uninhabited. Over the past four centuries the Sherpas have been driven ever higher into the mountains by the Chkhetri, members of an influential caste and ethnic group who live on the lower slopes. As a result of this the Sherpas have been forced to develop higher-altitude areas, cutting down forests and transforming the denuded areas into pasture land. The ecological situation has worsened even more since 1959, when the Kkhamba herders settled in the region after immigrating from the Tibetan region of the PRC. Concentrated in relatively small areas, their herding has caused the burden on the pasture land to become excessive. Trampling of the grass cover has markedly worsened the quality of meadows. The high mountain forests are being cut down even faster than before, because firewood is the sole source of fuel for the local population. Every Sherpa family burns over five tons of wood in the home each year, yet each Kkhamba family burns up to 20 tons.

Prior to the arrival of the new migrants the social guidelines and religious injunctions of the Sherpas, based on the experience of many generations, regulated use of natural resources and partially offset negative anthropogenic influence on the environment. Thus, local inhabitants were well aware that livestock should only be turned out to pasture after a certain phenological stage in vegetation maturity had passed. Therefore the Sherpas pastured their yaks in remote pastures, periodically driving them from one place to another. Now that the herds are dominated by a more productive but less resistant yak-cow crossbreed, the *tszo*, the Sherpas and the new arrivals pasture their livestock in pastures close to their settlements, thus damaging the grass cover.

The Vulnerability of Nature

All these cases of desertification of the high mountains prompt scientists to state that "the Himalayas in Nepal are dying a slow ecological death." In order to preserve the unique natural environment of the high mountain regions the large Sagarmatkha National Park and three other preserves were established in 1976. In 1980 the National Parks and Environmental Protection Department forbade local inhabitants to sell firewood to tourist groups. Tourists are required to use kerosene in place of wood. Attempts are being made to utilize other energy sources. Toward this end a grant from the UNESCO World Heritage Fund was used to build at 33-kilowatt

micro electric generating station outside of Namche-Bazar. An experimental solar-powered photogalvanic panel which is used to charge batteries has been placed on the roof of a tourist building in Libuche. Reforestation efforts have begun in the preserves. Stone walls are being built around groups of saplings to prevent them from being trampled by small livestock.

Disruption of the ecological balance in the industrially developed states is one of the serious problems of our time. However, this negative aspect of life has until recently scarcely affected the economically weak agrarian countries. Yet they have before them the example of Nepal, a virtually idyllic country with a virgin natural environment. Yet even there serious disruption of environmental integrity has occurred. There are several reasons for this: the worsening land shortage due to rapid population growth, the increasing "pressure on the land," vestiges of feudal relations, and extensive agricultural practices.

A solution to the ecological crisis in Nepal could be found through intensification of agriculture based on peasant cooperatives; however, this would not be possible under existing agrarian socioeconomic relations, which result from incomplete agrarian reform. It is also essential that reforestation efforts be expanded in order to restore destroyed forests.

In the few places where the first small industrial enterprises are located (Kathmandu, Birganj and Biratnagar) there is serious river pollution; the water in those areas has become undrinkable. Poisoning of the rivers results from a lack of sewage systems and water treatment facilities and the poorly developed public health service. The ruinous influence of man's commercial activity on the environment is exacerbated by the extreme fragility and vulnerability of this particular environment. The ever-increasing burden on the country's relatively limited resources could make the damage irreversible. That is why preservation of Nepal's unique natural landscapes as a world heritage is in the interest of all humanity.

Government Seeks To Dispose of Unused Insecticides

BK1210040291 Hong Kong AFP in English 0335 GMT 12 Oct 91

[By Kedar Man Singh]

[Text] Kathmandu, Oct 12 (AFP)—Nepal, one of the world's poorest nations, is looking to get rid of several hundred tonnes of unused insecticide, accumulated over the years through foreign purchases and aid donations.

The unwanted stocks include some of the 122 tonnes given to the Himalayan kingdom by Japan and Mexico in 1976, the International Year of Agriculture, but never distributed to farmers before the date of expiry.

It also includes stocks bought with a loan from the Asian Development Bank, but again never distributed due, officials say, to inefficiency and corruption in Nepal's former "panchayat" (partyless) government.

"It has now become a grave problem for the public exchequer to destroy the huge quantity of the different varieties of insecticides...without causing a health hazard to the general public," an official of the state-run Agriculture Input Corporation said. DDT, mercury compounds, aldrin, and endin are among the chemicals involved.

Of the 122 tonnes from Japan and Mexico, 86 tonnes wound up going to government tree nurseries and forestry areas—a situation blamed on corrupt panchayat bureaucrats.

Twenty-four more tonnes were sold at concessional prices to the Nepal Pesticide and Chemical Industry Company in Krisha Nagar, 290 km (175 miles) southeast of Kathmandu, for resale to the public, the official said.

Instructions from the Ministry of Industry have seen 26 tonnes go to the Hetauda Cement Factory, also a state firm, for incineration. But so far only 10 tonnes have been burned at its chimney due to local public concern about possible health affects, an official at the factory said.

Remaining lots of insecticide are being destroyed according to instructions from technical experts appointed by the Asian Development Bank, the agricultural official said.

They include a New Zealander, B.W. Graham, who is understood to have submitted a report to the government advising the government to destroy the expired insecticide in the cement factory's enclosed chimney.

Such is the practice in industrialized countries such as Canada, Britain, Sweden, and the United States. This creates hydrogen chloride and carbon dioxide gas, the official said.

Environmentalists in Kathmandu point out that the expired insecticides have already been banned from sale and distribution in other parts of the world, mainly for health concerns.

They add that several local insecticide merchants have accumulated sizeable stocks of expired insecticides which need to be destroyed under expert supervision.

The cost is expected to run into the millions of dollars—a sum which critics say is already hard enough for Nepal to come by.

Former Director Advocates Closure of Chernobyl Nuclear Plant

91WN0741A Moscow TRUD in Russian 17 Sep 91 p 2

[Interview with Viktor Petrovich Bryukhanov, former Chernobyl nuclear plant director, conducted by V. Naumov: "Confession: It Would Be Best To Shut Down the Chernobyl Nuclear Power Plant Completely"]

[Text] [Correspondent] First of all, Viktor Petrovich, congratulations on your ahead-of-schedule return. Please tell us a little bit about the conditions under which you were released...

[Bryukhanov] I served most of my sentence in a special regime camp. I lived in a barracks with triple bunk beds. This "dormitory" and its adjoining small courtyard were surrounded by an additional barbed-wire fence, so that the various barracks could not communicate with each other. Various kinds of people were serving time there, but generally it was the run-of-the-mill criminal element. People who were neither ruined for life nor broken comprised just five-seven percent, no more than that.

[Correspondent] And that was the circle you moved in? Did you ever run into the people who were sentenced along with you?

[Bryukhanov] No. Immediately after our arrest we were separated from each other, and after the trial we were sent to different camps. It is still unclear what the point of that was. Subsequently I was transferred to a forced labor camp, working in so-called "chemistry," and my location was about three hours' drive from Kiev. There I could see my family often, listen to the radio and read a lot. Then a few days ago the court decided for legal reasons to release me upon completion of one-half of my sentence.

[Correspondent] They say that you were irradiated during the first days following the accident and that you became seriously ill. Were you treated?

[Bryukhanov] It was determined that I got a dose of about 200 rems, far in excess of the maximum allowable limit. I have not experienced any specific health problems.

[Correspondent] Today, now that a fair amount of time has passed, has your view of your own guilt in connection with the Chernobyl accident changed?

[Bryukhanov] I was repeatedly asked by the court prior to my release whether I still considered myself to blame, and I replied affirmatively, because my official position made me responsible for actions by the personnel on duty at the plant. One of the reasons for the accident cited by the government commission was a failing on the part of the plant operating crew: reduction of the reactivity margin in the control protection system. That means that I was partially to blame there as well.

[Correspondent] I recall that another of the commission's findings was that the tragedy was the result of an extremely rare coincidence of unfavorable circumstances, something like that...

[Bryukhanov] Yes, that was the gist of it. But I would say that that point was explained by later studies. If one takes a look at the document subsequently compiled by an independent commission from the State Committee for Atomic Energy Supervision, one finds that at the time of the accident the reactor was in violation of 32 nuclear safety regulations. And if the regulations are mandatory for the operating crew, then they are probably equally mandatory for the designers. However, for some reason the reactor's design flaws are being kept quiet nowadays.

It was those flaws which made possible the coincidence of unfortunate circumstances which the government commission wrote about.

True, insofar as I am aware the reactors currently in operation have undergone a major rebuild. Perhaps they are still not up to international standards, but they have to a certain extent been able to bring them in line with strict Soviet safety regulations.

The problem lies elsewhere. In the fact that those efforts were made after the fact. We were not even aware of the reactor's design flaws. We were completely confident that the worst thing that we could do to the reactor was leave it without coolant water and cause what metallurgists call a "bear." We were not able to imagine anything worse. Not a single training manual, not a single regulatory document or set of instructions contained any warning about anything more serious than that. The only thing I knew, and that only by hearsay, was that the RBMK-type reactor did not meet international standards and was not used anywhere else in the world for power generation.

Of course, reduction of the reactivity margin did not solve anything. After completion of the inspection the button was pushed to shut down the reactor. After that a gradual damping process should have taken place. Instead there was a quick succession of nuclear decay which ended with an explosion. It was as if you were driving along in your car, came to an obstacle and pressed the brake pedal, but instead of stopping the car leaped ahead...

When the issue of who was to blame for this terrible accident came up I had no illusions; I was well aware of who would be the fall guy. Soviet science could not be put on trial, nor could the mighty academicians or the at that time still all-powerful Ministry of Medium Machine Building. The mechanism of justice is well known: in the event something goes wrong the first administrator is the first to be accused. And that person is guaranteed of going to jail. This judicial practice is backed up by "telephone law"; I felt the influence of that on my life right up to the last day.

[Correspondent] After the reactor explosion the accident area was examined by an International Atomic Energy Agency commission. That commission reached a conclusion which did not reflect the true scale of the tragedy. What, in your opinion, was the reason for that?

[Bryukhanov] Both the first report by the international commission and its second report, an amended version, reflected the same short-sighted approach that our own experts' conclusions did. Add to that another fact: in order to uncover the extent and magnitude of the disaster and to bring about change it was necessary first to have at least an approximate idea of where to look, of where to begin those efforts. That was where a general lack of preparedness became evident: experts underestimated the extent of radioactive contamination. The radius within which measurements were conducted was gradually widened. Only then were the most distant areas with elevated radioactive background levels detected.

For the sake of truth I feel that we must pose one more question: what was the radioactive background level in those places prior to the Chernobyl accident? Unfortunately, we do not know anything about that. Yet it is possible that if studies had been done previously, if there were baseline data for all the contaminated regions, some benchmarks to go by, then I think that the whole picture and the cause-and-effect relation might look different!

The political struggle, in which the Chernobyl tragedy is being used as a means toward certain ends, is not helping uncover the truth.

[Correspondent] Viktor Petrovich, you were in fact director of the Chernobyl Nuclear Power Plant when it was under construction. Did you have sufficiently reliable control over all aspects of the project to be certain that poor workmanship or deviations from specifications did not occur, and thus that no "time bombs" were built in at the time the plant was built?

[Bryukhanov] Sufficiently. Within, of course, the constraints under which the director of any facility under construction is forced to work. What do I mean by that? A project for me has the force of law; I am obligated to follow it to the letter. That includes the materials required for the project, and other elements of it. But in reality events force us to maneuver every step of the way. The project called for use of fireproof cable coverings starting with the very first unit. But there was none of that available; it was not even delivered by the end of the job. How did we get around this? We asked the planners, and they agreed to change the project specifications, permitting us to use ordinary cable, i.e. with a flammable covering. The exact same situation was repeated with the flammable roof over the turbine room. And so on.

There were other things as well. Both during the construction phase and later, as director of an operating plant, I felt the weight of a very heavy burden: I carried de facto responsibility for a city of 50,000. I got instructions, sometimes from the gorispolkom, sometimes from the party gorkom: allocate workers, set aside funding and materials... Now for this, now for that. A swimming pool 25 meters long was built, but that was not enough, the gorkom got all excited about building another one 50 meters long. No one listened to our objections, and they exerted tremendous pressure on us. The plant administration was also responsible for five schools, 15 kindergartens, street cleaning, communications system maintenance, etc. The present plant director fortunately does not have to worry about all that, but all the things I had to do! This "second front" was naturally to the detriment of safety.

[Correspondent] The nuclear power plant accident was a major blow to your life. Have you become an opponent of further nuclear energy development as a result?

[Bryukhanov] I do not feel that there is any reason for that. Today only dilettantes or people who are engaging in pure politics can continue to focus solely on thermal or hydroelectric power plants. Our country's coal reserves are nearing exhaustion, hydroelectric power resources are not boundless, either, and they are subject to weather-related and seasonal fluctuations. No, I respect the "green" movement, but its current victories are in some places already going beyond the bounds of common sense: the development of nuclear energy in this country has been virtually brought to a halt. Since it is so fashionable to cite the civilized world, then it seems to me that now is the time to recall its experience as well. There is not a single developed country today which can get along without relying on nuclear power plants.

I do not know what can be done to ensure that Chernobyl will truly serve as a lesson. I only know that it should not be perceived just with emotions, but with the intellect as well. Otherwise we will spend additional tens of billions stumbling around in the dark. Our foreseeable future is linked with nuclear energy, but safe nuclear energy, of course. Research is underway in other directions as well, but I do not think that other options will become practical anytime soon.

[Correspondent] One last question. Imagine that you are in the place of the present director of the Chernobyl Nuclear Power Plant. What would be the first thing you would do based on your past experience?

[Bryukhanov] Hard to say... If it were possible, I would recruit personnel.

[Correspondent] Explain that, please.

[Bryukhanov] You know, even though we have been accused of incompetence I remain convinced that our people were the most reliable and best trained. At one time they came here to serve a new cause. Everything was new: this equipment, the plant, the city. A collective of like thinkers took shape, bound together by more than just money. What happened was an especially terrible disaster for them. I am not talking about the fact that

some of them died and others got radiation poisoning. The people who bore the first blow of the accident, who were in no way to blame, are told: you let something like that happen, how can you work here now? That is very difficult to bear; that is something that is difficult to live with. They have scattered now, but who has replaced them? People were hurriedly brought in from all corners of the country. I do not wish to insult anyone, but can there be any real order where the "long ruble" rules and where the crews rotate in and out? That is fine for loggers, and maybe for oil workers... But not for a nuclear power plant. Under these circumstances I feel that the best thing to do would be to shut down the plant. Otherwise at a facility like that...

[Correspondent] Another accident could happen?

[Bryukhanov] Yes.

Ukrainian Nuclear Physicist Disputes IAEA Chernobyl Findings

92WN0002B Moscow KOMSOMOLSKAYA PRAVDA in Russian 21 Sep 91 p 5

[Article by special correspondents Ye. Umerenkov and V. Umnov: "The International Atomic Mafia Exists"]

[Text] Morelia-Mexico-Moscow—**"The international atomic mafia exists," announced a Kiev nuclear theoretician, and then disappeared... three days before, by some miracle, we were able to meet with him.**

In April in Vienna, London and Paris the conclusion of the international consultative committee under the aegis of IAEA [International Atomic Energy Agency] was finally publicized. At the request of our government, it had been in preparation for around a year. According to this conclusion:

—in the Soviet data on strontium and plutonium content in the soil, there was an observed tendency toward overestimation (by up to four times);

—the same tendency was observed also in determining the content of strontium (up to nine times) and cesium (up to eight times) in milk;

—no deviations were found in the state of health of residents who could be directly associated with radiation;

—and finally, the adopted protective measures or those which were provided in the long-term plan on the whole go beyond the bounds of that which is strictly necessary from the standpoint of ensuring radiation protection.

Immediately after the press conferences, the Western press began to speak: Are the Russians consciously exaggerating their own troubles?

In those days, Vladimir Chernousenko, a nuclear theoretician from the Ukraine, was finishing up a montage of the film "The Curse of Chernobyl" in London. The next day he held his own press conference, which had the effect of an exploding bomb.

Who Is Who

Vladimir Chernousenko is a doctor of physical-mathematical sciences and scientific director of the Ukrainian Academy of Sciences staff for eliminating the consequences of the accident at the Chernobyl AES [nuclear electric power station] in the special 10-km zone. He was one of the three official executors of the secret report to the USSR Government on elimination of the consequences of the accident. To this day, this report has not been published in the open press.

He received a dose of radiation in '86, and now checks into the hospital two-three times a year for treatment.

At the press conference, Chernousenko refuted the IAEA conclusions: According to incomplete data, 7,000-10,000 persons have already become victims of the catastrophe, and these are only the ones who died.

Almost the very next day, IAEA, in turn, spoke out with a rebuttal of Chernousenko. At first it announced that such a person does not exist. Then—that he was never at Chernobyl. And finally—that yes, he speaks the truth. But! Out of 650,000 persons who passed through Chernobyl in five years, specifically 7,000-10,000 should have died...from natural causes.

The management of the Kiev Institute of Theoretical Physics, however, suggested to Chernousenko that he immediately return to the Soviet Union. But he, listening to the advice of his friends—the special agencies are interested in you, they said—decided to put off his return.

He has still not returned. In September his tracks were lost in Mexico under very puzzling circumstances. Nevertheless, we were able to talk with him.

By some miracle, we were able to find Chernousenko at the international ecology conference, "On the Threshold of a New Century," which was conducted in early September by the Mexican organization of intellectuals, the "Group of 100."

[Chernousenko] A number of conclusions drawn by the IAEA simply amazed me at that time. Well, for example, they do not deny the fact that Belorussia is contaminated. But not all of it, just partially. The Ukraine, yes, it has been affected, but not much. And they cite figures which differ from the true picture sometimes by 10, and sometimes by 100 times.

[KOMSOMOLSKAYA PRAVDA] And what is the true picture?

[Chernousenko] There are data from the Goskomgidromet [State Committee on Hydrometrology], the Institute of Biophysics under the leadership of Academician Ilyin—this is a closed institute created during the

period of testing of the atom bomb—the Belorussian Academy of Sciences, the Ukrainian Academy of Sciences, and the combine's administration of dosimetric control in the zone—the UDC.

[KOMSOMOLSKAYA PRAVDA] Where did we get these data?

[Chernousenko] While preparing a report for the government and while working in Chernobyl, we had access to secret materials in one degree or another.

And so, together with the IAEA data—there are six sources of information. And all of them differ.

The "committee" report contains many figures and documents. Yet in fact it is clear to anyone: In order to obtain a 100-percent picture, it is necessary for a huge collective to work for several years. The IAEA simply did not have such capacities. They formed a commission—and I am not denying their competence, they may very well have been professionals. Yet any data may be carefully corrected in one direction or the other.

They had time to take a certain number of samples, and they had time to study a certain number of persons. And the Institute of Biophysics obligingly added the rest for them.

The report was prepared without the knowledge of the Ukrainian and Belorussian Academies of Science or the republic committees on Chernobyl.

Nevertheless, at the mouth of the Pripyat River there is to this day a spot with radioactivity of 20,000 curie. During the time of flooding it may be washed into the Dnepr, and there are 40 million people who drink water out of the Dnepr.

Furthermore, to this day there are no precise scientific data on what effect small doses of radiation have on the health of millions of people over a long period of time.

[KOMSOMOLSKAYA PRAVDA] By the way, such studies were conducted after the accident of '57 in the Urals. However, all this information was classified up until recently. Therefore, the experience of the Urals catastrophe in the sphere of radiology, biogeochemistry and ecology was practically not used in Chernobyl.

[Chernousenko] The IAEA objected to my announcement about the death of 7,000-10,000 Chernobyl residents. It referred to the statistics on the natural mortality rate. But this is hypocrisy! No one said that all 650,000 passed through the super-dangerous fields—in fact it was 10-20 percent of them. Unprotected people worked in fields with over 1,000 roentgens, and we supplied this information to the IAEA. Pick up the books published prior to Chernobyl: If a person receives 500 roentgens, in half the cases the lethal outcome occurs immediately, and in the remaining cases—with time.

I announce: THERE IS AN INTERNATIONAL ATOMIC MAFIA, headed by the high leadership of the IAEA. It is vitally interested in the development of atomic energy, and for this sake will agree to many things.

Is the IAEA Playing to the Soviet Government?

According to the data received at the USSR Ministry of Foreign Affairs currency-finance administration, in recent times the USSR has annually contributed $21 million to the IAEA budget. This is the third largest contribution after those made by the United States and Japan.

We might add that in forming the membership of the IAEA Secretariat, one of the primary considerations is the amount of the member country's contribution to the budget.

Up until now, all our atomic power plants which were inspected at the request of the government were found by the IAEA to correspond fully to international requirements on radiation safety.

The tragedy of the situation consists of the fact that the version which the IAEA presented to the entire world, evidently with the presentation of our government and the former Minsredmash [Ministry of Medium-Machine Building], is reassuring. So, we do not have to hastily build the necessary number of clinics, even though the present ones are overflowing. And we do not have to relocate people—after all, in the Ukraine over 12 billion rubles [R] would be required for this purpose.

I am not even speaking of decontamination of the territory, for which there is neither the methodology nor the equipment. According to our evaluation, the decontamination of the Kiev reservoir alone, which has become the natural burial place of radionuclides, may cost on the order of R100 billion.

[KOMSOMOLSKAYA PRAVDA] Almost two annual military budgets!

[Chernousenko] But where will we get such money? As paradoxical as it may seem, the government is interested in reassuring conclusions. And it is not the only one.

Minsredmash, and today Minatomenergoprom [Ministry of Atomic Power and Industry], is a state within a state. It promoted the development of hydrogen bombs, while atomic power was a by-product.

Do you think the military department is rich? No. After all, it lives off of the state budget. The richest was Minsredmash, and this wealth was due to atomic power. By economizing on radiation safety, they received sizable profits.

I was a patient at Clinic No. 6 along with the other fellows, and we had time to talk. In their words, the design of the RBMK-1000 [uranium-graphite channel-type] reactor, for example, contained 32 deviations from the radiation safety technology (this was shown by the conclusions of the

Gosatomenergonadzor [State Atomic Energy Inspectorate], plus the materials prepared at the Smolensk AES and at the Ukrainian Academy of Sciences).

[KOMSOMOLSKAYA PRAVDA] You stated that not one Soviet AES has a technical project for a reactor...

[Chernousenko] When we began looking at the documents, we found one stamped "secret": If less than 18 rods are left in the active zone of the RBMK for protection, this is like death for it. However, this was not included in the instructions given to the operative personnel.

Any accident at an AES—the Beloyarsk, Leningrad, Armenian, or Chernobyl in '82—was concealed even from the workers of the atomic plants themselves. This was by instruction of Minsredmash.

Even accidents at foreign AES's were concealed from our personnel. All these materials passed with the stamp "DSP" [For Official Use Only].

I am not saying that there were cannibals working in Minsredmash. No, they were normal people.

The problem was not the people—it was the system.

Paradoxes of Atomic Power

Here is an excerpt from a speech by Kh. Bliks, IAEA general director:

"It seems somewhat of a paradox that today, when many countries are experiencing an obvious need for increasing the production of electrical energy... when the 29 people who died as a result of the accident at Chernobyl (speech of 7 September 98—ed.) remain the only people killed by radiation from an atomic power plant, a number of countries, either based on law or de-facto, are introducing a moratorium on the construction of atomic power plants".

According to the information of the representative from Argentina who spoke at a meeting of the "Group of 100," today the IAEA is trying to see that the agenda of the World Ecology Conference to be held in Brazil in 1992 does not include the question of atomic power.

"From 1971 through 1984, in 14 countries there have been 151 accidents with varying, including severe, consequences for people and the environment."

"Atomic Science and Technology in the USSR", Moscow, 1987.

I am not calling upon you to shout: What an evil—atomic power! Everything must be built on clear economics, common sense, and a scientific approach. After all, it is so simple!

Yet instead of this, in our country the problems of taking worn-out units out of general operation and burying wastes have been carefully taken away from the cost of the atomic kilowatts...

Now about the contaminated territories. At first glance, the people should be relocated to clean areas. But if they were to be relocated, this should have been done right away.

[KOMSOMOLSKAYA PRAVDA] And how many people are there?

[Chernousenko] For Belorussia, two-thirds of the Ukraine and part of Russia—from 8 to 10 million people. They live—and unlike those who work in Chernobyl, they do not receive triple salaries—even though the radiation situation there is much worse.

In Belorussia, for example, there is a unique situation. On the moist polesye soils, even with a contamination level of three curies per square km there is a yield of up to 70 percent "dirty" milk. At the same time, on sandy soils it is possible to receive clean milk even at 40 curies.

Therefore, we cannot say: There is a contamination of three curies per square km—that is not so bad. But if it were 100 or 200... In Sweden, for example, at three curies they are already relocating people...

[KOMSOMOLSKAYA PRAVDA] And were there cases of relocation?

[Chernousenko] There were... The administration for dosimetric control of the "zone"—and, believe me, there are some first-rate specialists there—at the request of residents of the Ukrainian village Polesskoye, identified territories contaminated with up to 400 curies...

There is an Oriental saying: "If your thought is great, then the diametrically opposed thought—is also great." We should not relocate people by scattering them over the territories. This is a tragedy for them, and also it will be impossible to monitor their health. But at least the statistics will look good...

It is much better to monitor them, to supply them with clean food products, and to provide them with adequate medical aid.

[KOMSOMOLSKAYA PRAVDA] What are you trying to achieve?

[Chernousenko] That against which the IAEA sharply objects: That the expert evaluation of the situation be performed by independent scientists. And then, please—let us compare the data.

[KOMSOMOLSKAYA PRAVDA] Who could assume this role?

[Chernousenko] I spoke in London with the leaders of the Paguoshskiy movement of scientists. The conditions of alternativity would require a painstaking approach from one and the other.

Today, however, we hold a monopoly on catastrophe.

The IAEA: Whom Does It Benefit?

In 1957, when the IAEA was being created, it was presumed that there would be a shortage of fissionable materials in the world, and that the agency would deal with their distribution. However, when it became clear that there are millions of tons of natural uranium on Earth, the IAEA assumed two functions: To aid in the peaceful application of atomic energy and to control the nonproliferation of nuclear weapons.

Today it often is not able to deal with either one or the other. First from Iran, then from North Korea we hear reports that they are developing their own atomic bomb.

Evidently, they will also be unable to handle one other problem. Who will pay the Ukraine, Belorussia, and Russia the expenditures for "liquidation of the consequences of the accident" after their declaration of sovereignty? According to preliminary official estimates, up until the year 1995 these expenditures must comprise R33 billion. How will the "sovereign" AES of these republics be controlled, as well as those of Lithuania? (After all, theoretically the production of plutonium is possible on these reactors).

[KOMSOMOLSKAYA PRAVDA] In '86 you prepared a secret report to the government...

[Chernousenko] Fellows, do not provoke me to make statements on this matter. It has still not been declassified. I do not want any unpleasantries here.

* * *

The next day Chernousenko successfully presented his speech in the Mexican city of Morelia.

About 10 journalists rushed up to him right away, making arrangements for an interview.

For some reason these interviews did not appear in the Mexican press. We found only one mention: Yes, one of the speeches was presented by Chernobyl resident Chernousenko.

But Vladimir Mikhaylovich himself vanished. We were supposed to call him at his hotel. We called and asked to be connected with Senor Chernousenko's room.

"One moment," answered the girl at the switchboard.

We wait three minutes. We hear a man's voice, we repeat our request and wait another three minutes.

"The communications with the room are out of order, but in general Senor Chernousenko is not taking any calls."

The next day we go to the hotel. They do not tell us the room number, but instead connect us with... a doctor!

"Senor Chernousenko is ill. He is receiving oxygen," he answers with an American accent. "Call in about two days. I hope everything will be straightened out by then."

We go to the embassy, and together with its representative and the embassy doctor we go the following morning to the hotel. We are told that the previous night, between midnight and 0100, Senor Chernousenko and an American, Jeffrey Wilkerson, checked out of the hotel...

We have only the printout from the hotel's computer, which contains no entry of payment for medical services. However, it is clearly written: Categorically not to connect with anyone.

We hope the IAEA is not involved this time.

11 October Chernobyl Nuclear Plant Fire

Nuclear Power Ministry Statement on Fire

LD1210093991 Moscow TASS in English 0931 GMT 12 Oct 91

[Text] Moscow October 12 TASS—TASS on Saturday received a statement by Yevgeniy Ignatenko, head of the press service of the Soviet Ministry of the Nuclear Power Industry, about the accident at the Chernobyl nuclear power plant on Friday.

"At 19:46 on October 11, turbine No. 4 of the No. 2 reactor at the Chernobyl nuclear power plant was idled for repairs. Suddenly, at 20:09, an automatic switch turned the reactor on again, causing heavy currents in its electrical circuit and fire in its bus ducts.

"At 20:10, after the reactor was shut down, the oil was drained from the turbine and the hydrogen in the reactor was replaced with nitrogen. However, the fire in the bus ducts released hydrogen into the turbine room, setting its roof ablaze and destroying one of the trusses," the statement said.

The fire was put out by 23:30. No injuries or radiation release were reported. The reactor is now being cooled.

A special commission will arrive in the plant on Saturday to investigate the accident.

Further Accident Details Cited

PM1610142991 Moscow KOMSOMOLSKAYA PRAVDA in Russian 15 Oct 91 p 1

[O. Musafirova report citing official record of Chernobyl fire, with comments by Ukrainian presidential contender Vladimir Yavorivskiy, chairman of the Ukrainian Supreme Soviet Standing Commission for Questions of the Chernobyl Disaster: "It Was Horribly Reminiscent of April 1986"]

[Text] From the official accident log.

11 October, 2009 hours. When the second power unit's No. 4 turbogenerator was being taken out of operation the generator cut in asynchronously in motor mode. Short circuits occurred, causing a fire. The turbogenerator cooling system, in which hydrogen is used, was disturbed as a result of powerful vibrations. The

hydrogen exploded and ignited, and the roof of the machine shop collapsed (two spans and three girders, around 1,000 square meters).

2010 hours. Staff switched the generator off and started dealing with the accident—emergency draining of the turbine's main oil unit and expelling hydrogen from the generator cooling system.

2025 hours. Local fire fighters who arrived after being called started extinguishing the fire. Kiev and Chernigov fire-fighting units alerted.

2032 hours. Spontaneous cutting in of the 330 kilovolt switch in the No. 4 system's No. 3 generator-transformer assembly was observed. The switch was immediately shut off.

Reactor No. 2 was cooled down and additional absorbents were placed in the reactor cores. There was no seal failure in the multiple forced circulation system.

2230 hours. The fire in generator No. 4 and the collapsed roof over the generator have been largely extinguished.

0150 hours. The state accident investigation commission started work. All automatic electrical components in the generator-transformer-4 assembly have been sealed.

There were no casualties in the accident or fire.

Vladimir Yavorivskiy, chairman of the Ukrainian Supreme Soviet Standing Commission for Questions of the Chernobyl Disaster and prospective Ukrainian presidential election candidate:

"Kiev and the Ukraine have experienced a terrible night. It reminded them of April 1986, which, incidentally, we will not be able to forget. We are all sitting on a powder keg called the Lenin Chernobyl AES [nuclear electric power station].

"The fire registered one point on the international scale accepted in atomic power engineering, because there was no radioactive discharge. But this point will cost the already depleted Ukrainian budget millions of rubles. Our parliament insisted and still insists on the need for the immediate phased closure of stations before 1995. But the commission, which not so long ago represented the USSR Council of Ministers, has a different opinion—we should wait until the year 2000... The stubbornness and influence of the Ministry of Nuclear Power Generation are stronger than common sense. But who can guarantee that an accident with a higher risk factor will not occur here again? There are no such guarantees.

"Some 37 million people drink water from the Dnepr, our main river. There are around 600 tonnes of uranium in the three reactors at the nearby Chernobyl AES. If this nuclear fuel gets into the Dnepr, the 'Ukrainian question' will take care of itself as far as the Union is concerned..."

Deputy Director on Chernobyl Restoration Work

LD1210161491 Moscow TASS in English 1549 GMT 12 Oct 91

[By UKRINFORM-TASS correspondent Aleksey Petrunya]

[Text] Kiev October 12 TASS—Nikolay Skreka, deputy director of the Chernobyl nuclear power plant, said that the first and the third power units are now functioning. The fire site is now being examined, fragments of the collapsed metal structures are being removed. At the same time, orders are being filled for the production of pillars, which will replace the destroyed ones.

According to Skreka, about a month will be needed for cleanup and restoration. The work will include the movement of building machines to the fire site, the drawing up of restoration designs and the choice of the best ones. He stressed that the fire did not bring about the worsening of the radiation situation at the nuclear power plant and around it, because it did not affect the power unit.

Ukrainian Official Demands Chernobyl Closure

LD1210122191 Moscow TASS International Service in Russian 1142 GMT 12 Oct 91

[By UKRINFORM correspondent Aleksey Petrunya]

[Text] Kiev, 12th Oct.—Vladimir Yavorivskiy, chairman of the Ukrainian Supreme Soviet standing commission on issues pertaining to the Chernobyl catastrophe, stated today that it is necessary to immediately close the Chernobyl power plant. In an interview with a UKRINFORM correspondent in connection with the accident which took place on Friday at the station's second block, he emphasized that "a Ukrainian parliamentary resolution exists on the complete closure of the Chernobyl plant, of all the station's blocks, and the republic's government should implement this immediately. We cannot continue to sit on this powder keg. I repeat once again: The station needs to be shut immediately."

Having noted that last night has reminded the Ukraine, and Kiev in particular, of the night of 26 April 1986 when the largest accident in the history of nuclear power took place at the Chernobyl plant, Vladimir Yavorivskiy stated: "Thank God, this time everything worked out relatively well. The radioactive zone was not damaged, so we can say with assurance that no additional radiation has gotten into the atmosphere." However, he emphasized that this whole matter must not be left like this. A government commission is to get to the bottom of what has taken place.

German Minister Calls for Chernobyl Shut Down; Offers Help to Ukraine

LD2010082391 Hamburg DPA in German 0705 GMT 20 Oct 91

[Text] Kiev (DPA)—Federal Environment Minister Klaus Toepfer has again demanded the shut-down of the entire complex after visiting the Chernobyl nuclear power station. Above and beyond this, a new protective mantle is necessary for the shut down block four, because it continues to pose a danger to the environment, Toepfer said in Kiev yesterday evening.

According to Toepfer, there are considerable problems caused by increasing radioactive dust in the reactor block which was shut down after the 1986 disaster. The continually high radioactivity is breaking up the protective concrete mantle. Above and beyond this, leaks are occurring over a surface of around 1,000 square meters in the existing protective mantle. According to the Minister, this can apparently be blamed on planning mistakes.

According to Toepfer, who visited block four in which the accident occurred together with German experts, plans for a new protective mantle around the plant have to be implemented as quickly as possible. He promised German help to the Ukrainian side on the plans. However, other Western states will have to be involved in erecting the "sarcophagus", the minister said.

According to toepfer, the Federal Republic intends to bring to the negotiating table those USSR republics where the remaining six reactors of the oldest type, like that at Chernobyl, are still in service. Nikolay Steinberg, the top official responsible for nuclear engery in the Ukrainian Government, told journalists that from the point of view of safety, these plants have to be shut down immediately. It is technically impossible to improve the equipment. The federal environment minister also stated that last week's accident was worse than had been feared. There was a serious fire in the machineroom of the second reactor. According to Toepfer, the protective fire walls for the neighboring reactors are missing. This morning, Toepfer will end his four day visit to the Soviet Union and fly back to Bonn.

Controversy Over Construction of Rostov Nuclear Power Plant

91WN0725B Moscow RABOCHAYA TRIBUNA in Russian 28 Aug 91 p 2

[Article by Gennadiy Belotserkovskiy, RABOCHAYA TRIBUNA correspondent, Volgodonsk: "Holding Pattern"]

[Text] **The Chernobyl cataclysm left us virtually without an entire sector of power engineering—the nuclear sector. Under the pressure of the public reacting to the words "peaceful atom" like bees to a bear even completely safe AES [nuclear electric power station] began to close one after another.**

The unpredictability of the situation forced the authors of the new USSR Energy Program designed until the year 2010 to make the "Nuclear Power Engineering" section quite vague. If by 1975 the people stop being angry, the strategy is one. If antinuclear sentiments abate more slowly, of course, it will be worse, but it will be possible to wiggle out of the situation. And if there is no bright spot on the boycott (in the program text this is called an improbable event), then the country will totter on the brink of an energy and, hence, economic grave.

Of course, there are doubts as to the reliability of the presently produced nuclear equipment. The same program tells us that "the VVER-91 (type of reactor) design, which meets international requirements for AES safety and efficiency, is only being developed now." It turns out that existing reactors do not meet international requirements.

There are many questions, including concerning Rostovskaya AES. The local "greens" began with the slogan: "Give an Ecological Assessment to the AES!". They were met halfway and it was even agreed that they themselves would determine one-half of the composition of the future commission of experts. Candidacies were debated tediously for a long time—months. Hellish work was done and it was useless. Those on whom the "greens" relied at the time of the ecological assessment were either on distant missions, or were not warned at all about the possible trip to Volgodonsk. The ecological assessment was disrupted.

A mere imperfection, an accident? Or tactics? Further events show that, most likely, the latter, because the "greens" are now talking about the probability of a new assessment as about an extremely undesirable thing. Let us take one of their leaders—Nikolay Zhilkin, leading designer from the special design office of the Atommash, chairman of the city deputy commission on ecology and emergency situations.

"The assessment," he says, "will be a waste of time. The majority of the people will not trust it if the green light is given to the AES."

The last words put us on the alert. After all, an objective examination is fully possible. He and his friends should do some work precisely here. But, you see, he "is disappointed in everything" and cannot be approached. Willy-nilly, the following question comes to mind: Is this not fear? After all, if he proves to be wrong, he can say goodbye to his influence on people, to his role as a leader rallying the masses "for the fight," and to the powers of a deputy.

However, is it possible to simultaneously serve the truth and the crowd, which Zhilkin himself in my presence declared "irrational, unreachable by logical conclusions"? It seems, not. Power and truth, politics and science too often have been at variance in our history and too often our people have been told that "workers do not need this nonsense, this bourgeois pseudoscience." The results are well known. So, should once again

everything be simplified and reduced to the "popular feeling"? Is it not the duty of the deputy, as the chosen representative of the people, to go ahead of the crowd, to open its eyes to truths, which, granted, are unpleasant, but useful, and not to show indulgence toward the populace, performing the functions of a resonator?

I carefully read the report by the permanent commission for the protection of nature and efficient utilization of natural resources at the extraordinary session of the Rostov Oblast Soviet, on the basis of which the station was closed. You read it and your hair stands on end: terrible violations of AES construction rules, design deviations, and so forth. One wishes to run to Volgodonsk and to beat the workers of the nuclear station with whatever one can lay one's hands on. However, having become acquainted with an analysis of the report by nuclear specialists, I want to run in the other direction—to the oblast soviet—and to shout at its campaigners: "Why, guys, have you become entangled in lies?"

Here is only one fight in this battle of writing. The "greens," or rather the deputy commission:

"The oblast sanitary and epidemiological station is barred from inspection in the sanitary-protective zone and can operate only outside it."

To which nuclear men answer:

"This is a lie. It was precisely the oblast sanitary and epidemiological station that, in agreement with the AES, in 1987 removed the natural background in the station region, in Volgodonsk, and in the oblast in order to compare the data taken before and after the AES start-up. The oblast sanitary and epidemiological station will be given the opportunity for inspection at any point on AES territory."

And while the controversy is going on, the station and thousands of its workers live in a "holding pattern." In essence, they do nothing. They are bored, sigh, are angry at the "greens," and degenerate professionally. And they hope. The minutes of the conference signed by L. Ryabev and Russian Prime Minister I. Silayev give them the right to hope. According to them, the station is not closed once and for all. Just its construction is suspended. But the first power unit, after the completion of all work on it, is mothballed until better times.

However, months pass and better times still do not come. People leave for cooperatives, exchanges, and small enterprises.

"Our 'greens' appeal to fear, not to reason," A. Tereshchenko, chief of the AES safety and reliability department, believes. "They shy away from honest and professional talk. But at least they can be respected for consistency. However, we have a grievous grudge against some chosen representatives of the people. Fomenko, first secretary of the Volgodonsk City Party Committee, at first was an ardent "nuclear man." However, at the time of elections for chairman of the city soviet—he sought this position—Georgiy Mikhaylovich decided to please the people and voted against the AES. Someone else was elected and, suddenly, Fomenko is again our supporter. The views of Plygunov, second secretary of the city party committee and now our mayor, have undergone the same metamorphoses...

Tereshchenko discussed with me the merits of the VVER-1000 reactor at length. There is a strong vessel withstanding a pressure of up to 160 atmospheres, a concrete pit in which it is encased, and a huge hermetically sealed dome above, insulating this entire facility from the world—even during an accident nothing will break through it. There was not a trace of this at the Chernobyl high-power channel-type reactor.

Recently, Minpriroda has been given the right to make an ecological assessment of especially complex facilities. It must also state its opinion of the Rostov station. There are stirrings here. The International Fuel and Energy Association and prominent institutes have joined this work. In October up to 150 signatures by luminaries in science and technology, including foreign ones, should appear under the final experts' conclusion.

What will the conclusion be? We will report this without fail. One would wish that this might happen more rapidly and that the assessment would not drag out for the sake of some political considerations. The "holding pattern" should end more quickly.

'Secret Laws' Target Kyshtym Nuclear Weapons Pollution

92P50007A Moscow KOMSOMOLSKAYA PRAVDA in Russian 3 Oct 91 p 1

[Article by V. Nedogonov; "Kyshtym: A Nuclear Explosion With a 40-Year Record of Service;" satellite photograph accompanying article not reproduceable due to poor quality]

[Text] I recently saw secret laws with my own eyes. For example, the "Decree of the USSR Congress of People's Deputies: 'On Urgent Measures for Eliminating the Consequences of the 1957 Nuclear Release and the Emergency Radiation Situations of 1949-1956 and 1967 in the Urals Region.'" Judging from the text, the Congress has resolved "to declare this region a national ecological disaster area" and has instructed the government "to adopt a program for eliminating the consequences...and normalizing the situation in the area of the Mayak Production Association." Signed: "Lukyanov. Moscow. The Kremlin."

And here is another: "Decree of the Presidium of the RSFSR Supreme Soviet: 'On Urgent Measures for Eliminating the Consequences...'" The text resembles that of the previous decree, except the signature reads: "Yeltsin."

The ink had barely dried on the USSR President's order to create an expert commission to investigate the ecological situation in the South Urals when this thick file of documents emerged. It was immediately distributed to all members of the commission. The folder contains plans for providing hundreds of millions of rubles for normalizing the situation at the Mayak Production Association (which consists of factories for producing radioactive nuclear weapons components, plants for reclaiming nuclear fuel, a radioisotope factory, radioactive waste reprocessing facilities, etc.) and tens of millions for hospital construction.

The South Urals, of course, require material assistance. Two thousand seven hundred square km are now "aglow" there, and 437,000 people have been exposed to elevated levels of radioactivity. To all appearances, the atom-mongers already have a solution for the Kyshtym problem.

Russian Peace Committee Urges End to Nuclear Tests

LD1410145391 Moscow TASS in English 1308 GMT 14 Oct 91

[By TASS correspondent Andrey Palariya]

[Text] Moscow October 14 TASS—The Russian Peace Committee and the public antimilitary organisation "Novaya Zemlya-Nevada" on Monday urged Russian President Boris Yeltsin to ban nuclear tests in the Novaya Zemlya archipelago in the Arctic Ocean.

The archipelago is the second Soviet testing site after Semipalatinsk in Kazakhstan. The last test in Novaya Zemlya was made on October 24, 1990.

"Our appeal to the Russian president was prompted by our concern about the health of people living in the region and the devastating effect of testing on the environment," Vladimir Burakov, first deputy head of the committee, told TASS.

He said nuclear tests account for the increased number of congenital diseases, pregnancy and labour complications in the neighbouring Arkhangelsk region of northern Russia.

"We urge the president to take measures banning nuclear testing in Novaya Zemlya as promptly as he did with the Semipalatinsk testing range. It will release 650 million roubles for cleaning the ecological aftermath in the region," Burakov said.

Submarines Blamed for Radioactive Contamination

Scuttling of Reactors Rumored

92WN0048A Moscow KOMSOMOLSKAYA PRAVDA in Russian 6 Jul 91 p 5

["Confession" of unidentified Captain 2nd Rank (retired) recorded by O. Volkov under the general title: "To Catch a Reactor, Large or Small: The Confession of an Eyewitness"]

[Text] During the period 1975 through 1986 I was the chief of the complex that recharged reactors for nuclear-powered submarines at our northern bases near Murmansk. We changed the so-called "active zone": We removed radioactive waste and unspent uranium from the reactor, about 7-12 percent of it remained, and loaded in new fuel.

The spent waste lay for three years in special storage facilities at the bases. Then a special train was organized and it was shipped to Chelyabinsk-70 for processing. Previously there had been a burial site 100 km from Murmansk, to which all of this had been moved; we used this site together with the civilian steamship line, but it was very soon filled.

The radioactive water from the submarine reactors was poured into tankers and then stored at the bases in special containers. There it was diluted down to maximum permissible concentrations, then the same tankers were used to take it to the Barents Sea, where it was discharged.

But this was not the most terrible thing. After repairs, much solid waste was left: irradiated tools and clothing and worn-out parts. If they "registered" anything, it was goodbye. They were dumped into unsealed containers of the kind used for regular trash, made of 3-millimeter-thick steel. I know that at other bases the storage facilities were equipped, and at one, they were even underground. But at ours they were placed on a rock in the open. As prescribed, it was surrounded by a barbed-wire entanglement and there were towers and machine guns. But the officers' children, inquisitive as they are, were stopped by nothing... And when it rained all this trash was washed into the sea...

We had a motor ship, the Volodarskiy. It was crewed by drunks and homeless bums, in short, the most disreputable people. Containers filled with solid waste were shipped from the bases on this small motor ship. As far as I know they dumped it into the Barents Sea. In general, the instructions were that the containers had negative buoyancy, or, to put it simply, they would sink. But it sometimes happened that a box would not sink. Then they fired rounds at it from machine gun. It would sink, and what's the problem? They did not fire at the radiation...

Rumor has it that one container was "saved" and floated to Norway. Although I very much doubt that. It is more likely that a ship will sink off our shores than a box will float to some other shore.

Incidentally, three barges loaded with solid and liquid waste from a nuclear submarine did sink right there at the pier when I was at the base. On the last one, which sank in 1983, I remember exactly that it had six tons of cargo. It sank quite by chance: the boat was approaching the pier, and then suddenly there was a hole in its side. Naturally, no one was about to raise it. I think that it is still lying there to this day. As to what happened to the other tankers and barges used to ship radioactive cargoes, I think that they also received their "dose," I do not know.

Now they are starting to sell our submarines abroad, for the metal. The Finns and the Germans and the rest are not fools; they will hardly buy radioactive metal. This means that the reactor boilers are removed here, in the Union. What is then done with them? I have had nothing to do with this and cannot say for sure. At one time there were rumors that the reactor from the icebreaker Lenin was sunk in the Barents Sea. If that really occurred, then I think that the reactors from nuclear submarines can expect the same...

In a year we recharged six to eight submarines; they went for five or six years and then were again returned to us. Dozens, hundreds of tons were dumped into the sea! It is strange that only starfish are cast up on the shore. Now, of course, I understand what it was that we were piling up. I experienced it for myself; the list of my own defects would probably fill half a page of typewritten paper...

Nuclear Submarine Accidents, 1961-89

92WN0048B Moscow KOMSOMOLSKAYA PRAVDA in Russian 6 Jul 91 p 5

["Information from Western sources": "A Chronicle of Nuclear Accidents"]

[Text] Despite the fact that the number of accidents on Soviet nuclear-powered ships still remains almost a "military secret" for us, this information surprises no one abroad. We decided to use this information because our own statistics on the subject simply do not exist.

In 1985, speaking at a session of the U.S. Congress, Admiral James Watkins stated that "over the past 10 years there have been more than 200 accidents in the Soviet Union involving submarines. Some of them were very serious." Military expert Jim Wassert assessed the situation more simply: "Fires aboard Soviet submarines occur disproportionately often relative to the number of submarines."

According to figures from the international Greenpeace organization, which mainly made use of U.S. Navy dossiers, as the result of 11 accidents more than 50 nuclear warheads and eight reactors now lie on the floor of the world's oceans. Most of them belong to the Soviet Union.

We shall cite only some facts from the Greenpeace report.

July 1961. An accident occurred with a nuclear power plant on a Soviet submarine not far from the coast of England. The members of the crew receive strong doses of radiation and some of the ship's compartments and missiles were contaminated. Seven persons died a week later, and the captain died three weeks later.

1966. According to unconfirmed figures from the CIA, a reactor meltdown occurred aboard the Soviet nuclear icebreaker Lenin, as a result of which about 30 persons died. Many members of the crew suffered from radiation sickness. The ship was laid up for more than a year.

September 1967. A fire broke out on the nuclear submarine Leninskiy Komsomol not far from the North Pole. During the accident crew members were incinerated inside a compartment that was closed at both ends. The submarine was one of the first to reach the North Pole underwater.

April 1968. A Golf-class diesel-powered submarine sank in 16,000 feet of water near the Hawaiian islands. Eighty people died. The submarine was armed with three ballistic missiles with nuclear warheads, and torpedoes with nuclear warheads.

July 1968. An American submarine collided with a Soviet submarine. According to American naval officers, operations to "purge" the waters around military bases of Soviet submarines may become quite tough in nature, even going as far as underwater games of "chicken," when submarines sail on collision courses until one of them swerves off to the side.

December 1968. According to unconfirmed information from the CIA a nuclear submarine sank in the region of Severomorsk. The entire crew of 90 souls died. Divers found it on the bed of two rivers that flow into Kola Bay. When the submarine was lifted it became known that it had been lying on the bottom for about 80 days.

December 1972. An accident involving the release of radiation occurred aboard a Soviet submarine not far from the eastern coast of North America. The leak was associated with damage to a nuclear torpedo.

1978. A reactor meltdown occurred aboard a Soviet Alpha-class submarine.

August 1978. A Soviet submarine armed with cruise missiles was detected sinking 140 northwest of Scotland. The cause of the accident was a defect in the nuclear reactor.

August 1980. A Soviet submarine was seriously damaged and lay dead in the water off the coast of Japan. Nine people died in a fire in the power-plant compartments.

The early eighties. An unidentified Soviet submarine accidentally released a nuclear warhead not far from the Pacific Ocean coast of the USSR.

November 1981. A submarine sank in the Petr Velikiy harbor in Vladivostok.

June 1983. A Soviet submarine armed with cruise missiles sank at the southern end of Kamchatka. American intelligence reported that most of the crew—about 90 people—perished.

May 1985. A major explosion and fire occurred aboard a nuclear submarine when it was being refueled at a military base 35 miles from Vladivostok. As a result, the surrounding territory was contaminated and because of the high level of radiation the dock had to be closed. The contaminated body of water now covers an area 100 meters wide and 600 meters deep.

October 1986. An explosion and fire occurred in one of the missile compartments aboard a Soviet submarine armed with ballistic missiles not far from the Bermuda islands. The submarine sank when it was being towed.

November 1988. A meltdown of the nuclear reactor almost occurred aboard the nuclear icebreaker Rossiya. In February 1990 a fire broke out on the ship in a compartment aft.

April 1989. A Soviet submarine (the Komsomolets) sank off the coast of Norway. Forty-two of the crew died. The submarine's nuclear reactor and two torpedoes with nuclear warheads were lost.

This information was obtained from Western sources. Anyone who can confirm or refute the information should telephone the number 257-27-65.

Details of White Sea Submarine Accident Reported

Missile Fuel Said To Pour Into Sea

LD0210113291 Moscow TASS International Service in Russian 1103 GMT 2 Oct 91

[By TASS correspondent Vladimir Anufriyev]

[Text] Arkhangelsk, 2 Oct (TASS)—There was a Northern Fleet submarine accident in the White Sea, near Letniy Bereg, on 27 September.

A TASS correspondent learned from reliable sources that fire broke out in a missile tube during an attempt to launch a training missile from a submerged position. A large quantity of missile fuel was poured into the sea as the accident was being handled. The Northern Fleet command has neither confirmed nor denied this report officially.

Admiral Pakhomov Provides Further Information

LD0510160791 Moscow TASS International Service in Russian 1244 GMT 5 Oct 91

[By TASS correspondent Vladimir Anvfriyev]

[Text] Arkhangelsk, 5 Oct (TASS)—New details of the recent nuclear submarine accident in the White Sea came to light during a meeting of the Severodvinsk city soviet.

According to the Arkhangelsk oblast newspaper PRAVDA SEVERA, specialists from the enterprise building nuclear-powered vessels and representatives of medical and ecological services were among the participants in the meeting. They heard Admiral Pakhomov's account of what happened in the central part of the White Sea, where the vessel had arrived for training maneuvers.

"Practice missile firing was under way...," the newspaper reports, citing the admiral's account. The vessel was at launch depth. During the prelaunch preparation a defect was discovered and the launch did not take place. Captain I. Grishko made the decision to surface. When the vessel reached the surface, the captain saw a fireball on the deck. The missile had begun burning and spontaneously leaving the launch tube. After that, it fell onto the conning tower. To put the fire out the vessel started diving".

Later, the vessel went to Severodvinsk. There were no casualties, but some damage had been done. According to the admiral, "the solid fuel that ended up in the sea does not dissolve in water.

Nuclear Waste To Be Entombed in Ship in Murmansk

PM0910130991 Moscow Central Television First Program Network in Russian 1900 GMT 3 Oct 91

[From the "TV Inform" newscast: Report by S. Veselkov and M. Shakhmetov, identified by caption]

[Text] [Announcer] Some time ago scientists were scratching their heads over a mysterious phenomenon whereby starfish were being washed up on the shores of the Barents Sea. This was followed by equally mysterious deaths among the seal population. The reasons for the incident have been established. This took place in Moscow at a briefing on "Naval Facilities and the Environment." It turns out that during the period from 1964 to 1986 seamen at the Murmansk Shipping Company regularly delivered nuclear waste to Novaya Zemlya. Now in Murmansk work is going on to investigate the circumstances surrounding this. Here is a report from our correspondent.

[Veselkov] With the participation of Leningrad scientists, a conservation plan for the former tender Lepse has been elaborated. The fact is that this tender—which is no longer operational—cannot be used for scrap. There is

highly radioactive nuclear fuel waste on board that is unsuitable for treatment. Radioactive waste was sent to the Lepse by the Lenin, Arktika, Rossiya, and Sibir nuclear icebreakers. Gradually, all empty space inside the ship will be filled with a special cement solution. In this way, the old worn-out radioactive components will be packed into a massive cement block.

[M.P. Fillipov, chief of the "Atomflot" STU Radiation Safety Department, identified by caption] The storage facility must comply with all IAEA [International Atomic Energy Agency] requirements—international requirements—and will provide reliable storage for several hundred years.

[Announcer] The situation which has emerged in Murmansk is nicknamed the "Northern Chernobyl."

Micropollution Control Association Formed in RSFSR

91WN0743A Moscow KURANTY in Russian 11 Jul 91 p 6

[Article: "Yet Another Association"]

[Text] The RSFSR Ministry of Justice has issued a certificate of registration for a new public organization, the Association of Engineers for Micropollution Control (ASINKOM). It will promote the development and extensive introduction of micropollution control and the creation of clean technological environments in different areas of man's activity, above all in medicine, pharmacology, the perfume and food industries, agriculture, etc. For example, in Scandinavian hospitals there are 20,000 square meters of special "clean rooms" per 1 million of population, but here there are none. The conduct of surgical operations in them, for instance, sharply reduces the danger of complications and speeds recovery. In the food industry, including milk and meat processing, this makes it possible to create ecologically clean products with long storage periods.

The development of microelectronics, nuclear engineering, and optics also required the creation of especially clean rooms where the presence of dust, various types of solid and gaseous pollution, and aerosols is strictly limited; strict requirements are being established for temperature, humidity, the nature of air currents, the presence of impurities in the liquids and gases being used...

The new association will promote the unification of the efforts of specialists in different fields. It will inform specialists and broad circles of the population, perform independent expert study and certification, prepare proposals on the standardization and unification of requirements for clean premises, and contribute to shaping state policy in the area of micropollution control.

Moscow Area Solid Waste Disposal Problems Examined

91WN0743C Moscow PODMOSKOVYE in Russian 13 Jul 91 p 8

[Article by Svetlana Storozhenko: "Not Just a Dump"]

[Text] **"Twenty million cubic meters of household wastes—precisely this quantity of concentrated garbage is 'produced' in the Moscow region. Annually, 35 million rubles are spent to collect all this, transport it somewhere, and... bury it. Let us rummage through this gigantic amount of swill... There are 120,000 tons of ferrous metal scrap, 20,000 tons of nonferrous metal, glass, plastics, tons of waste paper, and 800,000 tons of food wastes." This is from information on the state of sanitation in Moscow and Moscow Oblast from the Permanent Commission on Municipal and Power Facilities, Engineering Support, and Public Welfare. Indeed, after reading these figures one wants, like Kozma Prutkov, to lift one's gaze from the earth to the heavens and shout in delight: "How astonishing, what order there is here!"**

Our never-ending socialist mismanagement has generated a mass of problems with sanitation in the Moscow region. Dumps were formed spontaneously and grew along the sides of roads, in quarries and ravines, gradually transforming these wounds in the earth into enormous, decaying sores, halting the process of decomposition of which is now extremely difficult in most cases. Right now there are 46 dumps in the oblast (or, as they are called, solid household waste sites), supervised by the Territorial Production Association for the Housing and Municipal Economy [TPO ZhKKh]. From the start, 44 of them did not conform to the sanitary and technical standards for a "site;" they have been in use from 20 to 50 years already, and it was long ago time either to close or to reclaim them. Moreover, there are another three Moscow sites in the oblast under the supervision of the "Ekotekhprom" NPO, occupying 200 hectares, which equals the area of the 46 others.

Regular observation of the surrounding environment in the zone of influence of solid household waste [TBO] sites and the selection of new sites, taking geological and geohydrological conditions into account, did not occur before 1984. The attitude toward the sites has always been as toward dumps, and therefore a time came, when the threat arose of turning the entire Moscow Oblast into one big dump. In connection with this, the "Scheme for Sanitation of Cities and Workers' Settlements of Moscow Oblast until the Year 2000" was drafted. It was approved in 1988 by a joint decision of the executive committees of the Moscow city and oblast soviets of people's deputies. However, even having just been born, this scheme already had a number of shortcomings, and not all its clauses can be implemented today. So, for instance, the question was being developed of constructing a number of garbage-burning plants in Mytishchinskiy, Odintsovskiy, and Lyuberetskiy rayons, i.e., in

zones that adjoin Moscow. However, the current ecological and political situations have made this problem hard to solve. Moscow has received a categorical refusal from the rayon and city soviet executive committees. For the same reason, the construction of a number of new sites, stipulated in the scheme, is impossible. Or, for instance, there is the following case: According to the plan, in Mozhayskiy Rayon they intended to cut down the forest for a site, but a building already stands there, on this plot: A womens' colony built its maternity home there. As usual with us, the left hand does not know what the right is doing.

However, the main problem for the municipal economy services, most likely, is people's misunderstanding. The futuristic slogan, "Throw Pushkin off the ship of contemporaneity!" has acquired broader scope. "Down with everything!" we shout, frightened by radiation, nitrates, and other physical and chemical achievements. "Down with everything—hydroelectric plants, thermal plants, nuclear power plants!" Of course, this also includes dumps. However, for some reason nobody wants to reject the benefits of civilization. It does not at all occur to this upstanding citizen, a zealot for the purity of the surrounding environment who shouts "Down with!" at the top of his lungs, that precisely he, and each of those shouting in unison with him, annually and neatly contributes his personal mite to the overall figure for household wastes, his own cubic meter of garbage.

Currently, a trend toward growth in the amount of wastes is observed. According to a forecast by the NIiPI for Municipal Construction, the quantity of wastes will increase by 5.5 percent annually. By the year 2005, about 30 million cubic meters is promised (this, let us recall, is 10 million more than today's). Where will we put the wastes from our daily activities? "Put it in a dump," says the fighter for ecology, "but not near us." And for greater persuasiveness, he lies under the bulldozer. Yet the executive committee supports him. Then the battle of sovereignties begins. Put it in the neighboring suburb: So what if the grass does not grow, it is no concern of mine, so long as everything is nice and clean for me. Then what are we sinking into? Incidentally, today it is technically possible to build a dump site that meets all sanitary standards, even in the center of a city. The difference lies only in its price. Of course, I am not suggesting that we develop a city dump in the central square of every city, instead of the traditional monuments to Lenin: I am simply theorizing. However, why should the rayon and city soviets not respond to the humble (and, incidentally, entirely reasonable) requests of the municipal services and, if they are so concerned about the cleanliness of their native rayon or city, establish constant supervision over the condition of these sites?

Today the Tsentrgeologiya PGO [Geological Production Association], on contract with the TPO ZhKKh, is conducting a study of oblast rayons for the purpose of finding territories, suitable for the location of TBO sites, and later, having selected several sites, will present these materials to the executive committees and ask them in session to approve one of them as a choice. These issues are being debated in the executive committee sessions so ardently, that matters sometimes almost come to blows. In Podolskiy Rayon, for instance, the chairman of the Kurilovskiy Village Soviet threw his deputy credentials on the table and declared: "Only over my dead body!" Really, one can understand him, but this, in my opinion, is not a way out of the situation.

Furthermore, with the help of the Tsentrgeologiya PGO, a geological and economic study of all the existing sites is being conducted. This work will be done by 1993, and then the picture of each site will become clear, and it will be easier to decide where, in the first place, the TPO ZhKKh should direct its efforts: which sites require reclamation, and which should be closed. For instance, the geologists did a study at the Zarayskiy site, where the Zaraysk Shoe Factory and several other industrial enterprises take their wastes, and discovered chromium there. There is a water intake unit facility. So, the fate of this site is already clear.

The Ikshinskiy site has been closed since 1 January. It is an awkward location: a quarry and ground-water boundary. Right now reclamation and reconstruction work is being done there. Those rayons which took their wastes there have been obliged to supply food and consumer goods to the stores.

Noginskiy Rayon, on the joint decision of the Moscow and oblast soviets, will receive 20,000 square meters of housing annually for its site. Does this mean it is possible to reach an agreement peacefully? I have no desire whatsoever to agitate, this is not the question. We must simply understand that the faster we close the old sites, most of which do not meet sanitary standards, the easier it will become for us to breathe. However, in order to close them, we need new ones, built according to the principle of the Kolomenskiy facility (it really does not resemble a dump, in our understanding of the word), provided with the necessary equipment and used in observation of modern standards and technologies. They are necessary, and this cannot be avoided.

It is customary to look at the prospecti of foreign companies working in this field, but, alas, we must reconcile ourselves to the fact that Western technologies for the time being do not fit our pocketbook. For instance, today we have no reliable, ecologically safe units for burning garbage. In the West, however, this is the most promising method for eliminating household wastes, not to mention recycling them. For us this is still somewhere in the realm of fantasy: We do not know what to do with waste paper and the like. We do not have our own units, which means that burning garbage is possible only with imported equipment which, of course, can only be acquired for hard currency. The cost of one such installation is from 30 to 150 million dollars. It remains only to sigh, spread our hands, and once again recall the unforgettable Kozma Prutkov: "Even the very last beggar, under other conditions, could be the first rich man." That is some consolation.

System of Pollution Tariffs Developed for Moscow

91WN0743B Moscow DELOVOY MIR in Russian 23 Jul 91 p 1

[Article by Aleksandr Kotov: "No Appeals to Conscience"]

[Text] The ecological commission of the Moscow soviet has finished drafting the concept of an economic mechanism for the use of nature.

The capital of our country long ago occupied one of the first places on the list of ecologically unfavorable cities. After many years of fruitless appeals to the conscience of negligent managers, the city authorities have decided to turn to a more effective, economic method of "education."

Now every enterprise, even those not exceeding the established standards for emissions and dumping [PDV and PDS], will be obliged to pay for them. The sum of the payment is determined by the harmfulness of the substance. So, whereas 1 ton of freon-1 emitted into the atmosphere will cost a plant only 20 kopeks, the same amount of soluble nickelous salts will cost 39,000 rubles. Slightly less, 32,000 rubles, must be paid for diethyl mercury.

When exceeding the standard, the sum automatically increases by a factor of five, and for accidental emissions or dumping, by a factor of 10. However, this is not all. It is proposed to gradually lower the plank for "permitted" pollution. Payment is stipulated even for the tidy warehousing of harmful wastes on one's own territory or for turning them over to a dump.

As the Moscow soviet reckons, only this path will lead to the ideal: waste-free technologies. After all, the standards themselves, as is already understood throughout the world, are nothing other than self-deception. Even "permitted" pollution makes the environment worse.

An original solution was also found for a financial problem. The usual argument of ecological "hooligans" is that they have no funds and will simply cease to exist. The money collected from the enterprises in the form of payments and fines will go into a special ecological fund. In order to receive aid from it for cleaning facilities, for installation of filters, or for reconstruction for purposes of decreasing or even eliminating toxic emissions, it will suffice to present a nature-preservation program. Upon its fulfillment, the fund will simply cancel the debt. If the enterprise spends the money but does not do as promised, repayment of the credit, with a bank percentage as well, will be demanded in court.

On the proposal of the ecological commission, the Moscow soviet passed a resolution on special documentation for all industrial enterprises. This will help the future financial and economic inspectorate of Moskomprirodа [Moscow Environmental Protection Committee] to catch the especially "astute" directors who, to reduce the concentrations of emissions and sewage, add clean air and water to them. The documents will clearly establish the quantity and chemical composition both of the raw materials received, as well as of the finished product.

"Right now, a package of documents is ready which awaits the approval of the Moscow soviet presidium," says Ye. Andrianov, board member of the fund of the Moscow soviet ecological commission. "After this, we will register the fund officially. In general, we need a Russian law, without which it will, as before, be very difficult for us to operate."

Ecological Investment Fund Established in Moscow

LD1010140391 Moscow TASS in English 1220 GMT 10 Oct 91

[Text] Moscow, October 10 (TASS)—The ecological investment fund has been set up in Moscow.

The fund having eight million roubles on its account, aims to give credits to enterprises to resolve environmental protection problems and create safe technologies. The fund receives money from compensation and regular payments by organizations for environment management.

Some 700 enterprises have already paid fines for improper development of environmental protection programs. But many enterprises responsible for seriously polluting the environment have so far failed to pay for this. The Likhachev Automobile Works has to pay five million roubles to the fund, deputy chairman of the Moscow city environmental protection committee Sergey Vasilyev writes in Moscow PRAVDA today.

The city government has begun implementing its resolution on economic methods for regulating environment management. Such methods were adopted in civilized countries long ago. A tax inspection is being created, Vasilyev writes.

Fines are rather hard, but they will help protect the city's ecology. Some 1,200 enterprise have been tested for nature management over a year, and efforts were not in vain, Vasilyev said.

Orenburg Gas Processing Plant Explosions Detailed

91WN0725A Moscow SOVETSKAYA ROSSIYA in Russian 15 Aug 91 First Edition p 1

[Article by V. Vedernikov, SOVETSKAYA ROSSIYA correspondent: "To Put on Gas Masks!"]

[Text] At the end of July Orenburg residents once again experienced close to a panic state.

An accident occurred at the Karachaganag deposit! The gas flow went directly to the oblast center. Orenburg gas rescuers were urgently thrown into the disaster zone (the

deposit itself is located on Kazakhstan's territory). Dozens of buses were sent to Ilekskiy Rayon near the border, which was the first to feel the impact. In the end evacuation was not needed, but for a while about a dozen villages were in the zone of suffocation. They were lucky: The wind blew in another direction.

What happened on the eve of the night, in the middle of which residents of Ilekskiy Rayon woke up from the wave of the gas attack that rolled in? Perhaps a natural calamity, uncurbed forces of nature broke out? Local "gas" management tried to spread such a version, saying that the topography was dissected to such a degree that sometimes it was impossible to guess from where gas "would squirt out."

This explanation is for simpletons. The Orenburg Oblast Committee for Environmental Protection adheres to another opinion. It is based on current data and it seems that it fully corresponds to reality.

And again, for the umpteenth time, we have to talk about our amazing disorder. Workers, who took care of the well where the accident happened, simply failed to do "something." As is well known, gas comes to the surface through pipes and, in order that it does not leak outside them, a special solution is poured around them. In our case the concrete "corset" was put on hastily—it was the end of the shift and it was decided to make up for this in the morning.

But in the morning it was already too late. The gas, coming from depths under tremendous pressure, swept away the weak reinforcement and escaped. Perhaps buses for evacuation would have been needed had nature not proved to be favorable for us. A spontaneous gas combustion occurred and the toxic flow supersaturated with hydrogen sulfide ceased its procession through villages. At the site of the well there is now a hot fountain, in the flame of which a derrick worth more than 1 million rubles disappeared without a trace. Thank God, this time there were no human victims.

Only there is a question: How many times do we still have to cross ourselves, hoping that the danger will pass and sidestep us? There is no answer.

I had occasion to be in the village of Muzhichya Pavlovka during the days when, essentially, it was already a dead village. Cucumbers and tomatoes were ripening in gardens, but they were no longer fated to await the owners' hands. The homes were of good quality and solid—one could live in them for a long time! However, the absence of curtains was a seal of doom. True, the owners lingered in two or three houses. I entered one of them. The occupants—now already former ones—were old people. Mikhail Vasilyevich Volkov went to the front from there and, before retiring on a pension, worked as a machine operator there. The mistress of the house lamented: She did not manage to find peace on her native land. A "public" house, that is, a one-room city apartment, is ahead.

Muzhichya Pavlovka founded by Yaitsk Cossacks a hundred years ago was dying a long and agonizing death. Even when the decision to move residents to Orenburg was adopted by the oblast executive committee, the village meeting said firmly: No. But again an extraordinary accident occurred at the gas well and newly fledged city dwellers moved one after another from their native nest. The Orenburg Gas Processing Plant (OGPZ)—the flagship of the local gas industry—was the death of the village.

Not long ago I read the following announcement in the local newspaper: "Machine operators are needed for work on the subsidiary farm of the OGPZ..." Everything became clear. The subsidiary farm was former Muzhichya Pavlovka; more accurately, its remaining production facilities. The gas plant tried to atone for its sin in this way. It gave kolkhoz members—at the expense of its own people in line for apartments—apartments in the oblast center. However, in order to go to work, they had to travel 10 versts to the former farm and to the field camp. But no one wanted to work there, in poisoned places. Life with gas masks, with night rush work, with mass poisonings, and with "bouquets" of acquired diseases remained deeply in people's memory...

In contrast to Muzhichya Pavlovka the village of Nikolskoye still "breathes." Machine operators of the local Progress Kolkhoz sometimes know the state of wells better than field men, although they make a big detour on their equipment: It is not safe to come close to the gas workers' farm—extraordinary accidents happen there constantly... This also happened this time (and again, for some reason, at night). The villagers woke up at 2 AM, gasping for breath. A rumble, as though a jet was getting ready to take-off, was heard from the direction of the well located not far from Nikolskoye.

And again a familiar scenario. Regular maintenance was going on at the well. And nothing bad would have happened had the steam exhaust device been used according to the instruction. Alas... Moreover, when the emergency situation "came to a head," no repairman was at the well. Otherwise, he would have detected the appearance of gas not from the powerful rumble, but from the weak hissing. There was an evacuation. In almost 24 hours the village, where more than 1,000 people lived, became depopulated...

We thoroughly discussed the problem of gas attacks and life on the gas volcano in general with A. Kulikov, chairman of the Orenburg Oblast Committee for the Protection of Nature. Anatoliy Gavrilovich, apologizing in advance, used by no means a parliamentary term—"fool's resistance." Things got to the point where a tractor operator—whether to deliver metal scrap, or for some other reason—pulled out a pipe from the well with his powerful machine. Now it is impossible to find out what he wanted: He died, burning together with the tractor.

Another example. While repairing the pipeline, workers... began to smoke. As a result, there were several human victims. But if one analyzes the situation, there were also all kinds of breaches of technological discipline in the same field. They happen constantly.

Two decades ago ancient Orenburg villages (not only Muzhichya Pavlovka and Nikolskoye) turned out to be on the territory of a gas condensate deposit, which, as newspapers wrote at that time, had no equal in the world. Its discovery and development in the early 1970's were accompanied by a big parade noise, a torrent of orders and medals for the trailblazers, and a rise in the positions and titles of managers of the shock construction project. However, time passed and it clearly showed to what haste and rash strategy in the development of underground resources lead. One after another accidents began at the complex.

It could not have been otherwise. Production dangerous in its nature, for the sake of high rates of construction and triumphant reports, was tacked together hastily, so to speak, and the elimination of faults was left for later. The more time passed from the commissioning of projects, the more complex and dangerously explosive—in the literal sense of the word—the situation became. In the last few years extraordinary accidents have become not an exception, but rather the norm.

Official circles craftily called the gas-condensate complex ecologically pure. Yet they knew beforehand that the equipment purchased from the French could not reduce to a minimum the harmful effect of the extremely aggressive Orenburg gas.

There were also many talks about the sanitary zone and about "moving" those who found themselves in the village's gas complex zone to a safe place. However, the suitcase frame of mind dragged out for many years and gas workers did not fulfill their promises. The barbaric devastation of Muzhichya Pavlovka was an exception. Worse than that, the economy of some strong kolkhozes and sovkhozes was undermined thoroughly. In Orenburgskiy Rayon alone gas workers withdrew about 7,000 hectares of fertile land from the turnover. And no compensation for it. Moreover, the sense of concern gave way to incomprehensible and groundless optimism: perhaps, this will pass.

As we see, this has not passed.

Nevertheless, something, although very little, is being done. The construction of the fourth stage is now going on at the OGPZ and, as it is claimed, with the entire environmental-protection package. This will make it possible to reconstruct the first two stages, which are in a state of complete wear. Main pipelines should be replaced urgently, but the allocated pipes are sufficient only for patching holes.

Orenburg residents received with a sigh of relief the news that Karachaganag gas would not be processed at the OGPZ (there was such a plan). It was decided to build a similar plant on Kazakhstan territory in the deposit region. Now the plan is undergoing an ecological assessment at three addresses: in Orenburg, Kazakhstan, and the Russian Ministry of Ecology. It is important not to make a mistake with the selection. If one well inspired so much fear in July, it is not difficult to imagine how much trouble an ecologically "dirty" gas processing monster can bring.

Donetsk Hosts Conference on Problems of Old Industrial Regions

92P50012A Kiev RABOCHAYA GAZETA in Russian 12 Sep 91 p 1

[Article by A. Dikanov; "The Donbass Seeks an Escape From Ecological Crisis"]

[Text] The International Geographical Union, the USSR Supreme Soviet Committee on the Environment and the Rational Utilization of Natural Resources, the Donetsk Oblast Executive Committee and its main information center, the Donetsk Scientific Center of the USSR Academy of Sciences, and the Donbass Environmental Association and other interested organizations are holding an international congress in Donetsk entitled: "Problems of Old Industrial Regions: Economy, Ecology, and Policy."

The choice of location for this impressive forum is no coincidence. The unique combination which developed in Donetsk of a high-powered industrial complex and of the natural objects which have felt its harmful effects allows one to list Donetsk Oblast as being among the nation's most environmentally strained regions.

While each resident of the republic is exposed on average to approximately 300 kilograms of harmful substances discharged into the atmosphere by industrial enterprises, residents of Donetsk Oblast receive 2.5 times this amount. Residents of cities such as Makeyevka, Gorlovka, Yenakievo, Mariupol, and Donetsk inhale almost three kilograms of dust and harmful toxic waste every day. Furthermore, the oblast is among the regions of the republic possessing the fewest water resources. The annual shortage of drinking water is over 400 million cubic meters per year. Despite this, consumers each year discharge into reservoirs more than 400 million cubic meters of polluted effluents containing almost 2.5 million tons of harmful substances. As a result, a catastrophic situation has developed in the Sea of Azov.

It was for this reason that it was decided to conduct the international congress in two stages. The first, of a theoretical character, launched an intellectual offensive to overcome the environmental crisis. The second is of a practical nature—an exhibition featuring new technologies, equipment, and instruments for cleansing particle and gas emissions and polluted effluents and for utilizing the discharges of various enterprises. Exhibition participants include over 10 foreign firms and an array of 40 Soviet organizations, including 10 from Donetsk.

Future of Safety Oversight in Dangerous Industries Questioned

91WN0734A Moscow IZVESTIYA in Russian
13 Sep 91 Union Edition p 7

[Article by A. Illesh: "With the Distintegration of the Union Dangerous Production Units Are Becoming Super Dangerous"]

[Text] *During the first broadcast of the very popular television program "Vzglyad" to appear on screens after its expulsion from Central Television, Anatoliy Chernyayev, an aide to Mikhail Gorbachev, was telling the detective story of the USSR President's captivity in Foros, and he reported what, in my opinion, was an extremely curious and moreover a telling detail. When the group of unexpected committee members and GKChP [State Committee for the State of Emergency] people announced themselves at Gorbachev's dacha, this person, who was close to the very highest circles thought: Obviously there has been another accident at a nuclear power plant. Another Chernobyl! That is what first came to a presidential aide's mind during this unusual situation.*

It is true that the post-Chernobyl syndrome in the USSR is enormous. And, in general, how dangerous are those dangerous production units, which are "scattered" across the country in enormous numbers? And what should be done with them now that the USSR is rapidly disintegrating?

For a start let us take a look at the sad statistics. In the first six months there were 300 significant (first and second cateogry) accidents at facilities which come under the republic supervisory organs and USSR Gospromatomnadzor [State Committee for Safety in Industry and Atomic Power Industry] (not counting accidents on railways and at bread-product enterprises). The number of people who lost their lives is high: 553.

V. Ryabov, deputy chairman of the country's Gospromatomnadzor, reports: in six months more than 392,000 investigations were carried out; 2.4 million (!) violations were discovered, and the operation of facilities was halted 150,000 times! Fines were levied against 36,000 people for infractions of all kinds. In 850 cases the materials were handed over to the investigative organs.

And S. Adamchik, deputy head of the Main Administration of USSR Gospromatomnadzor, thinks that the use of potentially dangerous facilities and wares throughout the economy and the defense complex, as well as the annual increases in the quantities which are being used with unregulated operational procedures are creating a situation which in the end may lead us to self destruction. Moreover, it is already leading us to it. But in this area, alas, fundamental measures are not being taken to prevent emergency situations. As soon as another tragedy befalls us, there are specialists trying to convince the government that what happened was only the result of a series of accidental events which happened to coincide. Let us recall the terrible accident near Ufa in which 1,224 people in two train cars were killed or injured. There was only one accidental factor here: two trains ended up at the same point at the same time. But a defect in a pipeline is something to be expected. And it is something to be expected in contrast to a natural disaster. It is a matter that rests with human hands.

How many tragedies must still occur before the correct conclusions are drawn from all this? What awaits us tomorrow? The specialist is convinced that the impasse results from the lack of a system for regulating the social relations which ensure safety. It is a fact that this kind of system was not carefully established when all property was concentrated in the hands of the state and one could carry out this process using administrative-command methods. And what will happen after privatization? The disintegration of the country, which is an objective process, makes this question even more urgent. How can one live and work calmly when all these potential "mines" fall into different hands? After all, every entrepreneur and every enterprise will decide questions of safety, based on their own understanding of "safety."

Imagine this picture: all the nuclear and chemical weapons have been distributed to various enterprises as well as to the population, and they have been told: "Act!" Maybe this is an exaggeration, but something similar is now emerging in industry. The following are already in the hands of nonprofessionals: sources of ionizing radiation, toxic substances, chemical preparations, explosives, etc. The government and legislators must understand that all of this may be found with various forms of property (including state ownership) and there is only one condition under which they will not threaten the life or health of the population and environment, and that is if there is strict regulation of the safety issue. And it is the state which must regulate this activity. Alas, just as there was no order in this area before, there is none now.

Specialists in the West claim that safety is an economic concept. If we want to have a safe production unit, it is essential to invest more money in designing the facility, in improving equipment and in training specialists, etc. The entrepreneur will never undertake these expenditures by himself. In order to force him to do so, the state acts by means of laws and specially-created state regulatory bodies.

Let us recall how the question was formulated even quite recently: plans for industrial enterprises were supposed to cost as little as possible. Up to now the main way to make projects cheaper has been to economize on safety. The state never had an independent expert committee on the safety of enterprises. As a rule the inspectors and experts served the agency which had responsibility for putting enterprises on stream rapidly. The existing state expert commission which comes under USSR Gosplan and USSR Gosstroy was again largely oriented toward reducing the cost of the project.

Out of all the state organs which exist today, it is the following which must concern themselves with this complex problem: USSR Gospromatomnadzor and to a significant degree the Main Fire Protection Administration of the USSR Ministry of Internal Affairs, as well as the Public Health Inspectorate of the USSR Ministry of Health. But... S. Adamchik claims that in our country the necessary significance has never been given to the work of these organs. There are the residual principles of financing, the low technical level of equipment, the lack of the necessary scientific support... And above all there is the lack of any legislative basis for their work, which makes it impossible for them to be effective.

An inspectorate for technical safety is, in essence, a public prosecutor's office for technical matters, which must ensure the citizens' right to live safely in proximity to potentially dangerous production units. There must be clear, round-the-clock control, regardless of a change in government or even the appearance of a State Committee for the State of Emergency, which in our country, as recent events have shown, is becoming a common phenomenon. Given any (federative or confederative) "dismantling" of the country, it is necessary to have an appropriate interrepublic organ to, fulfill the coordinating functions of a regulatory agency.

Otherwise, we will have to count on an increase in the number of disasters and lost lives—in each republic as well as throughout the country.

Oil-Eating Microbe Isolated at Tyumen Institute

PM1010140091 Moscow MOSCOW NEWS in English No 38, 22-29 Sep 91 p 2

[Unattributed report from the "300 Words" column]

[Text] The local sanitary and epidemiological centre in the heart of Tyumen has detected an occurrence of putidoil. This little-known microbe raised in the Special Laboratory of the West Siberian Petrogeology Research Institute was spotted not only on the walls, in the air and all the floors of the institute's main buildings, but also in the canteen. The putidoil, raised to combat the polluted surface of reservoirs and capable of devouring various oil in unlimited quantity, has been "arrested." The microbes were insulated in triple packing and removed from the premises. The laboratory in which they were raised has been closed down.

More on Alleged Sverdlovsk Bacteriological Accident

92WN0012A Moscow LITERATURNAYA GAZETA in Russian No 39, 2 Oct 91 p 6

[Article by Natalya Zenova: "Military Secret. Part II"]

[Text] A year ago, our newspaper published my article, "Military Secret" (LITERATURNAYA GAZETA No 34, 1990), on an outbreak of malignant anthrax in Sverdlovsk in April 1979. Having investigated the circumstances of the incident, I concluded that the tragedy was not caused by people's consumption of infected meat in their food, as the official version reads, but by the release of a bacteriological weapon which occurred in the so-called 19th military cantonment.

The article debated the arguments of professors I. Bezdenezhnyy and V. Nikiforov, cited in the May 1980 issue of the ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOLOGII, the only publication on this topic in the Soviet scientific press. I showed that there were by no means "isolated illnesses" in Sverdlovsk—the dead alone numbered about 70 people; that the infection penetrated by way of the respiratory tract, therefore the disease manifested predominately in the lungs; and that there is a reason the disease infected basically the residents of Chkalovskiy Rayon, living south of the military cantonment—at that time the winds blew from precisely that direction. The article ended with an appeal: To create a parliamentary commission and conduct an investigation of the Sverdlovsk accident.

No official reaction whatsoever followed. On this subject, the "upper echelons" kept the same graveyard silence that lies in sector 15 of the Eastern Cemetery, where victims of epidemics are buried according to special rules and where to this day people walk warily... After all, right after LITERATURNAYA GAZETA (LG), other publications also came out, meetings were held in Sverdlovsk, there were appeals to deputies...

Then I decided to continue my own investigation. The impetus was a refutation of sorts which came to the editors from a person famous in the United States: M. Mezelson, professor of biochemistry and molecular biology at Harvard University, who was an independent consultant for an interdepartmental work group in 1980, created by the U.S. government to investigate the epidemic in Siberia. M. Mezelson insisted on the natural nature of the outbreak and wrote about the competence of the Soviet scientists (on his invitation, it seems, they visited America). Xeroxed copies of published materials related to this trip were attached to this letter: Thus, for the first time I was able to familiarize myself with our side's complete arguments.

Moreover, my volunteer assistant readers (thanks, above all, to Muscovite V. Zagranichnyy) sent a whole selection of publications in the foreign press on the subject of the Sverdlovsk accident.

January 1980. The first report on the incident with reference to an anonymous source. It speaks of an explosion at a military enterprise and about a possible violation of the convention on biological weapons, ratified in 1975.

March 1980. The U.S. officially demands explanations from the USSR: The USSR answers that a natural outbreak of malignant anthrax had occurred. The U.S.

government questions this and claims that it has evidence of a release of bacteria into the air as a consequence of the accident.

April 1986. Through the general secretary of the Pugwash Movement, Dr. Mezelson makes an attempt to organize a scientific discussion of the nature of the outbreak.

August 1986. Mezelson meets in Moscow with former USSR Deputy Minister of Health Care P. Burgasov, RSFSR chief epidemiologist I. Bezdenezhnyy, chief pathologist V. Nikiforov, and his assistant O. Yampolskaya, all of whom were in Sverdlovsk at the time of the outbreak.

April 1988. Burgasov, Nikiforov, and V. Sergiyev, director of the Institute of Medical Parasitology and Tropical Medicine, visit the United States, where they give official reports and participate in scientific discussions.

The press reported on this visit extensively, but the journal FAS PUBLIC INTEREST REPORT covered it in particular detail, being the organ of the Federation of American Scientists (FAS), which has been struggling for a halt to the nuclear arms race for many decades. A significant part of the September 1988 issue was devoted to the Soviet scientists' reports. They named (finally!) the number of dead—64 people—and the number of those infected—96 (mass vaccination of the population began immediately after establishment of the diagnosis). The general conclusion: The epidemic infected domestic cattle, people were infected by an intestinal form of the plague as a result of consuming the meat, sold in violation of sanitation rules, in their food.

So, on what new arguments is this conclusion based?

A Diagnosis Vanishes

So, all 64 people, it is claimed, died of an intestinal form of malignant anthrax. Its symptoms: "An elevation of temperature up to 41 degrees Celsius, chills, weakness, and headaches were noted in the patients. In the course of several hours, acute pain in the stomach, vomiting, and diarrhea appeared..." (from the journal FAS PUBLIC INTEREST REPORT).

I already quoted a detailed description of the course of the disease, which doctors observed in the hospital. Yes, there were chills, yes, there was a high temperature, but not one doctor recalled pains in the stomach, the more so acute. They all, to a man, described a picture of a very severe pneumonia which led to a lethal outcome in literally in a matter of hours. Not even artificial ventilation of the lungs helped. It is no accident that the first death certificates are marked "bacterial pneumonia."

However, perhaps the stomach and intestinal symptoms were observed at home, and the doctors in the hospital simply did not manage to ascertain them in time?

A year ago, I had few addresses for the deceased. Now, it is a different matter. So here I am, walking from home to home, troubling people's memories...

The widow of M.F. Markov: "When we called the doctor, she said: ORZ. She prescribed some medicine. My husband began to take it, but he grew worse right before our eyes. I thought: maybe it is pneumonia? I began to rub him and keep him warm, but nothing was helping. I ran for an ambulance, and they immediately said: It is pneumonia, possibly lobar, and took him to hospital No. 20.

"No, he did not complain about his stomach. There was nothing like that either at first, or later... Early in the morning I ran to the hospital to see him, but he had already died. The doctor told me that he would have died all the same: His lungs had become like jellied meat."

The son and daughter-in-law of A.P. Komina: "At first Mama grew stronger and got up on her feet—first she was better, then worse... She even went to the doctor herself, and they gave her a diagnosis of 'ORZ.' But later she took to her bed. The 'emergency' doctor said, 'It looks like pneumonia.' When we called a second 'emergency' doctor, the doctor even accused us: What kind of relatives are you, to drive your mother to such a state, she has very serious pneumonia. At the hospital, they told us: 'Prepare yourselves, your mother will not last long.'

The son of A.A. Komelskiy: "In those days, Father worked a great deal in the garden plot by our home. He was glazing the greenhouse. One day in the evening he said: 'I have taken ill with something, obviously I have caught a cold...' And everything was just like with a cold, only something was hindering his breathing and his temperature kept going up. Later it got quite bad, and father ordered us: 'Call an ambulance, I am afraid it might be pneumonia.' The ambulance took him away, and the next day he died.

The widow of A.N. Syskov: "My husband came home from work and asked: 'Get me the thermometer.' We measured—his temperature was about 40. And he was breathing somewhat strangely, as though panting, as though gasping for breath—that sort of breathing. No, he had no diarrhea at all, and his stomach did not hurt. He had always been so healthy! I called an ambulance, and when the doctors arrived, he was tossing in bed—that is how bad it was for him. He died in the hospital the next day.

As soon as it was established that malignant anthrax was raging in the city, the diagnosis of "bacterial pneumonia" disappeared from the death certificates. As I was told at one home, much grief was visited on the first ones: People came to them afterwards and persistently asked them to give back the death certificate...

However, let us return to the symptoms. One way or another, of course, this is still not proof. The results of post-mortem examination and, of course, bacteriological

analysis will give a reliable diagnosis. Omitting the details, let me note one thing: The emissaries of Soviet science spoke in the United States only about infections of the intestines. Their reports were supported by a series of color photographs taken, it was indicated, by V. Nikiforov during the post-mortem examinations. The conclusion: "There was no evidence whatsoever of cases of a lung form of malignant anthrax."

But here is what I was told by the highly experienced Sverdlovsk pathologist F. Abramova, who was present at most of the post-mortems (this is how, before the arrival of the "luminaries" and before the results of bacterial analysis, she first defined the plague): "All of the deceased had several infected systems, in some one system predominated, but **the respiratory system was infected in all of them** (the emphasis is mine—N.Z.). This attests to the fact that introduction occurred, evidently, through the respiratory tract.

I met with V. Sergiyev and O. Yampolskaya, V. Nikiforov's former assistant (alas, he himself, as well as I. Bezdenezhnyy, are no longer alive). They threw up their hands: Nobody knows whether the photographs demonstrated in America were kept or where to look for them.

However, life does not erase all traces. It turns out, not only V. Nikiforov had made photographs! L. Grinberg, who had worked in the pathology and anatomy group at that time, had also taken some. His photographs escaped destruction: True, not all of them. However, even those that survived intact, as L. Grinberg says, "give a different picture," than the one that was presented in the United States.

Where the Wind Blows From

"At first, it seemed that the victims of the disease had nothing in common, but it later became apparent that they all had to do with illegally produced meat... The meat came from small private producers..." (from FAS PUBLIC INTEREST REPORT).

Very well, let us assume that all 64 of the deceased ate meat, bought from private producers. However, a natural question immediately arises: If these people ate the meat at home, how come there were no cases of infection of other family members? And why did basically men die? The explanation that was given across the ocean is as follows: In Russian families meat is saved—according to "custom"—for the heads of families. This explanation is not only unscientific, it is simply false. In not one of the houses that I visited was this "custom" followed: They all ate from the same "pot."

The largest center of infection within Chkalovskiy Rayon was the ceramics plant. Almost a third of all infections are among its share. Its workers also live predominantly in the surrounding homes. Why did the plague rage with particular force precisely here? It turns out, here is why:

"In April, the ceramics factory received several beef carcasses and the meat was put up for sale. At least one of the carcasses was infected..."

Who ascertained this and when? Where are the documents, who are the witnesses, and were the guilty parties found?

There is no evidence, no witnesses, no criminals. To make up for it, there are the first and last names of people, including the "first" persons, who declared entirely responsibly that the plant never received uninspected meat and never traded in it.

"Really, if they had found something, even the slightest hint that it was our fault, would I be sitting here talking to you now?" This rhetorical question of G. Khusnutdinova's, then and now director of the plant cafeteria, you will agree, makes up for the many missing forms and documents.

Yet there is still evidence: "At that time, the KGB was working here day and night. However, as you can see, I am alive and well, and not a single hair has fallen from my head." These are the words of the chief of the mixed fodder shop at the Aramil Grain Products Combine, B. Martyanov.

The trip to this combine was especially important for me. The accuracy of the answer offered in the United States to the main question, "How did the cattle of the 'small private producers' become infected?" depended on it. I recall that in the only article by Nikiforov and Bezdenezhnyy, published in the Soviet press, it was ambiguously stated: "The infection of the animals occurred, most likely, through the fodder."

Understandably, it was impossible to go abroad with such a "conclusion." So a clear answer was given: "The source of the epizootic was infected bone meal, used as a fodder additive. It arrived with a 29-ton shipment of bone meal produced at a plant in Aramil, a town located 15 km south of Sverdlovsk... This meal consists of bones and other wastes from meat slaughter-houses, mixed with grain. The mixture is placed in an autoclave for the purpose of deactivating the spores of malignant anthrax and other pathogenic microbes. The production process at the Aramil plant violated established technical rules."

Now, I continue my interview with B. Martyanov:

"In general we do not produce and have never produced meat and bone meal. We receive it in finished form from various suppliers, and all shipments are accompanied by certificates of quality. There is no enterprise in the rayon of Aramil that makes this meal. We do not and have never had any autoclaves whatsoever or other such equipment. When the accident happened in Sverdlovsk, we checked the entire technological chain, all the documentation, all our suppliers and buyers. And finally, we never sold our output to the private sector. In general, we are not party to any of this."

What the Devil Are They Doing Over There?

Official representatives of the U.S. government found that the "explanation leaves many key questions open." I also have a number of questions, to which I was unable to receive an answer:

1. Why immediately after the tragedy happened were all the disease histories, all the post-mortem records, and in general all the documents in all the institutions "involved" confiscated? Including things that at first glance seem innocent, such as lists of families who received aid at the "Red Cross" line?

2. Why was the investigation of the mass deaths, started by the Chkalovskiy Rayon Prosecutor's Office, suddenly cut short, and the case transferred to a different, by no means civil, authority?

3. Why was massive decontamination work carried out in Chkalovskiy Rayon: They removed layers of soil, quickly laid asphalt, and washed the walls and roofs of buildings (which, incidentally, was denied during the "scientific tour," but is described in detail by witnesses)?

4. How come the widely broadcast promises, already given in America, on the forthcoming publication of a "great quantity of pathological and histological data relating to the outbreak" were not fulfilled?

And finally, about the situation surrounding the 19th military cantonment: As already stated, the military continues to deny its involvement in what happened, beginning with those working there directly and ending with former Minister of Defense Yazov. The military especially insists that the production of vaccine preparations "for protection of the troops and population" in the 19th cantonment was halted. In response, let me merely repeat the reply of Mr. Crocker, a U.S. State Department official, quoted by the American press: If this military project is no secret, then "how come they will not let us visit it?" And if it is secret, then "what the devil are they doing over there?"

It is not easy for me to write all of this. I am not one of those people, who easily suffers the failures and blunders of one's native land. However, having said "a," one must say "b." It is my duty, both to a country, which has concluded a convention prohibiting the production of bacteriological weapons, as well as to the memory of simple people, of Anna Petrovna Komina, Mikhail Fedorovich Markov, Aleksey Nikolayevich Syskov, and many, many others, whose lives came abruptly to an end before their time and strangely. To those close to them, who were "compensated" for the loss of their husbands, sons, and mothers with a paltry 50 rubles, and not all even received this. And to the distant friends and readers of LG: Possibly, they remember that LG, alas, did not play the best role, attempting to "stifle" rumors in the world about what happened in Sverdlovsk.

"A situation, in which certain state institutions within the country may violate the international obligations accepted by the country, is not ruled out. A situation in which the state itself violates them in strictest secrecy is not ruled out," writes A. Yablokov, USSR people's deputy, deputy chairman of the Committee on Matters of Ecology. Incidentally, in general he does not consider even international monitoring to be a panacea: A test-tube of deadly bacteria can always be hidden from the eyes of inspectors. The main solution, in A. Yablokov's opinion, is "at the level of law, to recognize actions, related to the development, storage, and use of bacteriological weapons as a CRIMINAL ACT. The majority of developers—the military, scientists, and engineers—do not want to be potential criminals, no matter with what secrecy and high salaries such production may be protected."

These considerations seem extraordinarily topical to me. Nonetheless, I think we need yet another act, which deprives antihuman development work of its main concealment, the cover of "secrecy." Drafts of a law on state secrecy, part of which is military secrecy, have been traveling somewhere along the corridors of power for a long time already. Although there has not yet been a public discussion of the law, it seems that jurists are united in the opinion that actions which entail danger to people's lives and well-being cannot be included in such "secrecy."

"The right to health is one of man's most important rights and, it goes without saying, it is impossible to place any, even the 'highest' state considerations above it." Let this opinion of S.S. Alekseyev's, chairman of the Committee for Constitutional Inspection, be the last point in my article.

However, there are many marks of omission before official investigations and conclusions.

Vladimir Pollution Reaches 'Catastrophic Proportions'

PM1110155791 Moscow Russian Television Network in Russian 2100 GMT 7 Oct 91

[From the "Vesti" newscast: Report from Vladimir by R. Komlev and A. Verkholashin, identified by caption]

[Text] [Announcer] Now today's news through our correspondents' eyes: first, an alarming environmental issue. The Kuban could become a valley of death, scientists from the Kuban Medical Institute warned the population of Krasnodar Kray. The intensive introduction of toxic chemicals to the kray over the last 35 years threatens the population with extinction. In the last year alone 500,000 cases were recorded of patients with diseases of the alimentary canal.

Quite recently the Klyazma River was a nature reserve, and party and state leaders spent their leisure time there on its banks. But now there is none of that.

[Komlev] Attention is invariably drawn to the grandeur of Vladimir's churches and cathedrals, built on the high

bank of the once beautiful Klyazma River. This river has, regrettably, been transformed today into a real cesspool. Everything is poured into it—not just plant and factory industrial waste. The pollution has reached catastrophic proportions. And nobody has anything to do with this robbery. There is no other word for it. Obviously many enterprise and organization leaders find it hard to grasp the difference between nature's riches and sewage.

[G. Yesyakova, deputy chairman of the Nature Conservation Society, identified by caption] Klyazma River water is used for drinking even though it contains almost every chemical element under the sun. The purification installations are not very effective today, removing roughly 60 percent.

Extensive Pollution of Ukraine's Lvov Oblast Outlined

91WN0555A Lvov ZA VILNU UKRAYINU in Ukrainian 8 May 91 p 2

[Article by Mikola Kopach, junior scientific associate, Lvov Branch, Ukrainian SSR Academy of Sciences Economics Institute: "Degradation"]

[Text] Lvivshchiyna [Lvov Oblast] is the most polluted oblast in the Western Ukraine. This has happened because our bowels of the earth are rich in minerals that have all-Union and sometimes world importance - in particular, potassium and table salts and sulfur deposits. There are also significant reserves of oil, natural gas, coal, construction materials, mineral water and forestry. Another reason is the excess of labor resources and availability of skilled work force; the colonial status of the Ukraine is the third reason. The result is a colonial structure of the national economy, when a territory is a raw materials appendage, with barbaric utilization of the those materials. The availability of an excellent (for the USSR) transportation network, which supports effective export of resources, is also an important factor of the current ecological situation. But the administrative-command system, for which ecological laws are something out of the UFO sphere, has become the main factor. All these factors have led to the current ecological crisis, whose consequences it is impossible to foresee.

According to our calculations, 17 percent of the oblast territory, with over 60 percent of the population (approximately 1.68 million people) is polluted with effluents of industriasl enterprises. There are 420 settlements here, including all cities and towns and the majority of town-type settlements. Polluted are the majority of historical and cultural monuments, which accelerates their destruction, and a large number of environmental protection objects (69 all in all) with the total area of 158.1 hectares. The effect of pollution on environmental protection objects is especially harmful, because it actually reduces to zero their preserve status.

An alarming fact is that pollution of atmospheric air at resorts, such as Truskavets, Nemirov, Shklo, Velykyy Lyubin, substantially exceeds the maximum allowable levels, which makes doubtful the effect of medical treatment. Barring immediate and radical measures, we can lose the resorts forever. The majority of harmful effluents is produced by enterprises of Union subordination (Yavorov and Rozdol production associations "Sulfur", the Stebnik Potassium Combine, industrial enterprises in Lvov, Drogobych and Stryy, the Nikolayev Cement Plant etc.). They are creating a continuous belt of polluted territory that stretches from the border with Poland in the Yavorov rayon through Lvov, Nikolayev and Novyy Razdyel to Drogobych, Truskavets and Stebnik. Outside this territory there are substantial sources of pollution in the Sokalsk (Krasnograd and Sokal), Kamennyy Bug (Dobrotvor), Busk and Brody (Ozhidov) rayons. The Dashava Technical Carbon Plant causes great environmental harm. Sources of pollution have even appeared in the Carpathians - Borislav, Turka, Skole and Slavskoye.

The situation with open water reservoirs is not much better. We have virtually no non-polluted rivers anymore - even Carpathian brooks are being constantly polluted, to a larger or smaller degree. After the accident at the tailings storage of the Stebnik Potassium Combine we have lost what has been until quite recently the cleanest European river - the Dniester. Even today we can see the results of this crime - unusual fauna that is typical for flat country rivers has appeared in the upper (mountaneous) reaches of the Dniester. The Poltva, Mlynivka, Tysmenytsya, Vereshchytsya, Svinya and other rivers have become sewage collectors. Badly polluted are the Zapadnyy Bug and lower reaches of the Stryy, Rata and Solokiya. And all this is taking place in spite of insufficient water supplies for the Ukraine as a whole and the Lvov oblast in particular.

Ill-conceived land reclamation projects, which for some reason are understood here mainly as only drainage and irrigation, are causing great harm.

It is well known that our oblast is located on both sides of the Main European Divide - the flow of a large number of the Ukraine, Poland and Moldova rivers is formed here, therefore, it is a crime to conduct drainage on the scale it is being done even now. However, strange as it is, nobody pays attention to this. As a result of this activity there are hundreds of destroyed rivers, and the ones that are left have turned into anemic straight canals (Gnilaya Lipa, Zolotaya Lipa, Zolochevka, the upper reaches of the Zapadnyy Bug etc.) with water that is harmful if consumed. The situation with pollution of soil and underground water (whose studies must be started immediately) is the same.

In recent years certain steps are being taken toward improving the ecological situation . At the Department of Ecologo-Economic Problems of the Western Region, Economics Institute, USSR Academy of Sciences, under the direction of Mr. Kravtsiv, methodologies for exacting financial penalties for polluting water and atmospheric air with harmful effluents were developed.

These developments have been implemented in the Lvov, Ivano-Frankovsk and Volin oblasts and the cities of Lvov and Ternopol. They have already yielded significant economic benefits, but radical changes are still a long way off. Unfortunately, leaders of certain oblasts, including the Ternopol oblast, not understanding the importance of this matter, are in no hurry to implement at their oblasts the mechanisms for payments for pollution, which makes the situation worse by the day, and not just in their oblasts, but also in neighboring ones, because with these problems a joint effort is necessary.

The published draft of the Ukrainian SSR Law: "On Environmental Protection", very much needed albeit not absoultely perfect, imparts certain optimism.

Summarizing the above, we are coming to an unconsoling conclusion of the threat to the existence of the population in Lvovshchina, as in the Ukraine in general. Even now we have one of the highest children's mortality rates in the world, natural population growth has dropped sharply, and in the majority of the oblast's rayons the size of the population has diminished in absolute numbers. The number of pathological deviations in the newborn has sharply increased.

Pollution caused by chemical enterprises, which Lvovshchina is especially rich in, is utterly dangerous. The effect of many chemical compounds is not observed immediately - they gradually accumulate in an organism. In the end, irreversible changes occur in the organism; they are transfered genetically, which leads to the appearance of mutants, infertility in women and men and lifespan reduction, and all in all it threatens a nation's degradation. Thus, one can talk about ecological genocide against the entire people. And here there is no difference with respect to the national, confessional or class affiliation - ecological laws act uniformly.

The situation is extremely serious, and if one does not resort to radical measures, Ukrainians, as well as the entire population of the Republic, could simply die out. And no renewed and patched up Unions will help them in this - the far-away center does not care about us all. There is only one way out - an independent State, where we, the masters of our land, will be solving our problems ourselves.

Chernobyl's Effect on Ukraine's Forests Viewed

92WN0002A Kiev RABOCHAYA GAZETA in Russian 1 Aug 91 p 2

[Article by V. Samoplavskiy, Ukrainian SSR minister of the forestry industry: "Echo of Chernobyl: With Bare Hands Against... Radiation"]

[Text] **The farther the fatal night of 26 April 1986 fades into the past, the more large-scale and tragic the Chernobyl catastrophe looms before us, and, unfortunately, the more dangerous and complex are its consequences. This is clearly seen in the ecological situation in our forests, which have taken the primary impact of the nuclear disaster. Since the pollution fallout from it contains a predominance of radionuclides with a long-term period of decay, it would be extremely naive to hope for a rapid improvement in the radiation situation here. Yet something else concerns us. For example, in determining the content of cesium-137 in the trees, mushrooms, and berries in dynamics by year, there is a clearly manifested tendency toward its continuous accumulation. This process, scientists believe, will continue.**

It is understandable that the composition of radionuclides and their physiochemical properties differ greatly at different distances from the epicenter of the accident. In the nonuniform soil-climatic conditions of the Polesye this leads to the fact that the very processes of their accumulation in living organisms are also different. Moreover, sometimes they differ significantly even under identical conditions. This greatly hinders the study of the dangerous phenomenon, which often brings us rather unpleasant surprises. Thus, in the northern part of Rovno Oblast, on the territory which, they insisted, was relatively favorable, it was found that the forest food products—mushrooms and berries—as well as the grassy vegetation (and consequently also the milk) were unsuitable for consumption because of their concentration of radionuclides. And it is difficult to say how many more such unexpected surprises await us in the near future.

Analyses testify to the fact that at a distance of over 100 km from the AES [nuclear electric power station] even with a relatively low density of soil contamination, the total content of cesium-137 and cesium-134 in a significant number of the mushrooms, berries, and plants exceeds the marginally allowable standards. And with a contamination level of five curie per square km, practically all the food, fodder, and medicinal resources of the forest are totally unsuitable for consumption. And we have almost a million hectares of such areas, where one cannot gather berries without dosimetric control. Yes, we are doing everything possible to see that these products do not get to the dining table. But what should we do with the numerous so-called unorganized mushroom and berry gatherers, who supply them to consumer cooperative procurers, or take them to market themselves?

The trees themselves also accumulate radioactive substances, which limits the application of lumber, especially for fuel. So a rapid taming of the "peaceful" atom, toward which we had been oriented, did not come to pass. Today we understand everything quite well: The road to overcoming the disaster is long and fraught with difficulties, and often requires great risk. The forest industry workers have been relegated a specific role in this difficult work.

Immediately after the accident, our specially organized subsections found and extinguished over 100 fires in the extremely aggressive 30-km zone. And beginning in 1987, reforestation work has been systematically performed here. On the decontaminated areas of the "red forest" alone, 450 hectares have been covered with protective planting. Parallel with this, within the last two

years another 5,400 hectares have been planted in trees on land outside the boundaries of the zone which is unsuitable for agricultural use. And this work continues.

However, all this is being done at a high price. Today there are over 26,000 forestry workers living and working on the territory contaminated with radionuclides—in essence, one out of every four such workers. Studies conducted by the All-Union Center for Radiation Medicine have determined that they are receiving doses of external gamma radiation which are 1.5 times higher than the representatives of other sectors. This is explained by the fact that the radioactive substances are contained in all the components of the forest underlayer, and consequently act on man from all sides. For example, the total average annual dose of such radiation received by the personnel of the Polesye timber mill in Kiev Oblast and the Narodichskiy in Zhitomir Oblast in 1988 comprised 1 rem, and last year—0.5 rem. What should we do in this case?

The five years of experience in working under conditions of radiation contamination convinces us that today in forestry we need a principally new approach to the organization of production. For this it is necessary first of all to have an up-to-date, detailed knowledge of the radiation situation in the forests, to provide the appropriate medical control, and to perform decontamination measures as necessary. Unfortunately, the poor material-technical provision does not allow us to adhere to these vitally important requirements in full volume. Sometimes it is the most elementary thing which is missing. At the same time, additional limits for the zone which suffered during the Chernobyl catastrophe were allocated for the Ministry only in 1986. After that, we have been meeting our needs by redistributing our own funds. It is clear that in such a situation we cannot even think about a principally new approach to the organization of production processes in the sector. Moreover, even the funds that we have we are not always able to use properly. For example, we have an acute shortage of gamma spectrometric equipment for our laboratories. It is supplied to us by the Kiev department of the All-Union Izotop Association. Unfortunately, I cannot remember a single case when this equipment arrived in full complement. As a rule, we get it sometimes without power units, sometimes without detection units, without lead protection, etc. The Marinelli vessels intended for measuring samples remain an acute problem. Their centralized manufacture has not been organized, and the cooperatives that have been able to assimilate the new product quite rapidly sell it at very high prices.

That very same Izotop Association completely disrupts the delivery schedules for DRG-OGT dosimeters. It is true, the manufacture of the household dosimeter Pripyat has recently been perfected in our country. We have already received the first 100 such instruments. However, here also we cannot do without unpleasantness. The fact is that they are not certified by USSR State Committee for Output Quality Control and Standards, and consequently the data obtained with their help cannot be officially acknowledged.

Or let us take the following. For the sixth year we are practicing forestry under conditions of radiation contamination, and for the sixth year there has been talk at all levels about the need to provide the sector with equipment which has airtight cabins. However, this requirement is being realized at an extremely slow rate. Moreover, the delivery of such machines at the present time is declining. In essence, the only factory about which we do not yet have any complaints is the Kharkov Tractor Plant, which supplies us with the T-150K. The other enterprises, including also the Yuzhnyy Association in Dnepropetrovsk, clearly do not meet our requirements. What is the matter? It turns out that there are no component parts. The reason, of course, is an important one. However, to allude to it in this case would hardly be serious. After all, we are speaking here, specifically, not about technology, but about people's health. We have even agreed to raise the prices of these machines somewhat, and thereby to interest the enterprises in increasing their output. Be that as it may, the problem has come to a head and must be resolved.

As surprising as it may seem, the design of our special TDT-55 forest tractor does not even provide for radiation protection. And this testifies once again that, unfortunately, not everyone has understood the problems of Chernobyl. Or let us take the following fact. Four enterprises in the republic are retooling low-tonnage vehicles into vans. However, not one of them wants to take even the documentation for the manufacture of such equipment with airtight cabs to meet the needs of the forestry workers. Consequently, we need a coordination of efforts at the level of the republic organs. I would like to hope that we will finally be heard.

Specialists have computed that as a result of the accident at the Chernobyl AES, the republic's forestry industry has incurred losses in the sum of over 100 million rubles. And if we consider what has been said above, it is not difficult to understand that this figure is far from final. However, this is only the economic side of the matter. But how can we compute those irreplaceable, truly colossal losses which our people, the workers of the forestry industry, have incurred and continue to incur as a result of the catastrophe? Even today, when these losses may not only be theoretically avoided, but when it is a practical necessity to avoid them. Only indifference serves as the barrier. Do we really have to remind them of the simple truth—that Chernobyl is our common grief? And to fight it with our bare hands is madness.

'Ecology Police' To Patrol Kharkov

92P50010A Moscow PRAVDA in Russian 24 Sep 91 p 1

[Article by I. Lakhno; "They Sniff and They Fine"]

[Text] As an experiment, a unit of ecological police has been formed in Kharkov. For now, its members serve in three of the cities nine rayons. Their task is a prosaic

one—to maintain the cleanliness of streets, squares, and courtyards. An automobile with a defective engine spewing smoke, a broken sewerpipe, someone littering—all are within the purview of the "policeman-ecologist." Violators are fined.

This business did not, of course, arise from the good life. This industrial giant is already terribly dirty, polluted, and rubbish-strewn.

'Primitive' Oil-Extraction Methods Blamed for Pollution in Bashkiria

LD1110125591 Moscow Radio Rossii Network in Russian 0700 GMT 10 Oct

[Text] Another large area of Bashkiria has been officially declared highly dangerous to people's health and agriculture. It covers the territory of the Tuymazinskoye and Shkapovskoye deposits, the most densely inhabited in the republic. This is the conclusion of people's deputies representing environmental bodies who visited Oktyabrskiy, an oil-workers' town in Bashkiria. For many years, the oil-workers have used the most primitive extraction methods, pumping thousands of millions of tons of corrosive liquid and chemical detergents into the oil-bearing strata. Nature could not stand up to such pressure. All this filth spread through the aquifers, poisoning almost all sources of water. It is now flowing through streams, small rivers, and underground sewers into the Kama and Volga, poisoning everything in its path. Many villages and settlements in the area are without their own sources of drinking water.

Scientists Debate Tajikistan's Rogun Hydroelectric Project

91WN0714A Dushanbe KOMSOMOLETS TADZHIKISTANA in Russian 14 Jun 91 p 11

[Interview with A. Yanshin, V. Luchnikov, O. Soboleva, M. Burkhanova, K. Sevenard, I. Pyankov and V. Grigoryeva, participants in an interrepublic physiology congress, conducted by Rano Makhmudova under the rubric: "Ecology and Us:" "Our Worries"]

[Text] **In Dushanbe, an interrepublic physiology congress was held, raising ecological issues, as well. Two "round-tables" were conducted in Tursunzade, one—"semi-circular", to use Academic A. Yanshin's humorous expression,—in the reception area for the president of the republic's Academy of Sciences. Here, scholars of history, philosophers, economists, seismologists, geologists, representatives of the public and journalists gathered. Those who care about the fate of their homeland, their country, their planet.**

—The public's role is growing every day,—said Aleksandr Leonidovich **Yanshin**,—I can only express my joy and complete satisfaction in this regard. In our time, we have successfully prevented the reversing of the northern rivers, and now we are striving to begin work on the revitalization (recreation) of the flooded lands along the upper Volga. Today, similar problems have arisen in Tajikistan, as well, in connection with the erection of the Rogun GES [hydroelectric power station]. In this republic, where the area of land suitable for agricultural use is extremely small, there are plans to flood the land. Is this not a paradox? But it is too late to stop construction now, we can only look for an optimal solution.

An assessment of Rogun by an expert commission has been conducted, but I have not studied it in detail. The list of experts is authoritative for the departments that have an interest in preserving the project without major changes, and for them, its conclusions are also fortunate ones. Unfortunately, not for us, the protectors of the environment. It is for this reason that we have gathered here, I even ran out on my class section, because I could not remain indifferent to Rogun, to the fate of these lands and the people who live here.

I am struck by the fact that the experts are not in the least concerned about the flooding of a large number of populated areas, and that the ecology does not worry them at all. All attention is directed towards the stability of the dam. It is strange that one very significant fact has not yet been considered: the vast reservoir is edged by steep inclines, which threaten it with blockages and landslides—it is hard to foresee the consequences. It is entirely possible that problems will arise that are identical with those at Sarez. And so, we must consolidate ourselves in order to conduct our own, **independent** assessment, a sociological survey of the population of the adjacent regions and settlements, and only then will we demand that changes be made in the project.

V. Luchnikov, doctor of geological sciences and All-Union Scientific Research Insitute of Petroleum-Related Geological Exploration [VNIGNI] specialist, expressed his extreme concern about the salts "factor".

Salts, he said, are more frightening than a volcano. Many years ago, topographical surveys made by Khodzha-Mumina showed that they are increasing. They suggest that the cap of the salt hill be encased in cement. I don't know if this will do any good. I think that we simply need to bore several wells in order to get a picture of the actual situation. I will use an example—at Maydan, we found a karst field with sinkholes 20-30 meters deep. And all that was there was a small stream. We filled the sinkholes with concrete, but they would always reappear. And just imagine what would happen if the mountain "floated away". That would be a disaster! We wouldn't even need an earthquake then.

—Incidentally, about earthquakes—**K. Mirzoyev**, corresponding member, deputy director of the republic Academy of Science's Institute of Earthquake-Resistant Construction and Seismology, entered the conversation.—On a seismic map of the area, we have given the part of Tajikistan where the Rogun GES is being built nine points. The dam was designed by the

S. Ya. Zhuk All-Union Planning, Surveying, and Scientific-Research Institute [Gidroproekt] for the kind of seismic movement indicated. A government assessment commission last year confirmed that these calculations were correct. However, there was one important factor that it neglected to consider: the calculations were made more than ten years ago with the level of knowledge and methods of that time. Besides this, the earthquake resistance of our dam had been evaluated for an American nine-point earthquake. The USSR construction rules and regulations that were implemented in 1981 require that such unique structures be designed not for just any nine-point force, but for one that is characteristic to the given location,—it is, after all, very likely that it will differ from a "foreign" one in amplitude, frequency and length of the quake process. At this time, there are no experimental recordings of nine-point earthquakes in the area where the GES is being built (they occur, thank God, once every 500 years). But we have well-developed and tested methods for acquiring recordings based on weaker earthquakes in the research area. This is why we proposed to Gidroproekt that a reassessment of the maximum potential seismic force be included in the new research program, which would allow the dam's earthquake resistance to be recalculated during the construction process. If it became necessary, corrections could be made limiting its height (in order to guarantee safety).

One mustn't forget about the possibility of earthquakes stimulated by the creation of the reservoir (which, possibly, will lead to an increase in tectonic movement). Here, the level of seismic activity is higher in comparison with the area of the Nurek reservoir, where, incidentally, as it was being filled, the number of earthquakes doubled. For the sake of fairness, I will note that on the whole, this has decreased the seismic danger: for now, large tremors have disappeared. But it would be rash to use this analogy, as the content and density of the bedrock in the earth's crust differs in each place. In order to avoid unpleasant surprises and to assure the safety of the growing Rogun GES, we must take everything under consideration. The construction of edifices of this importance must be carried out under strict scientific supervision.

O. Soboleva, doctor of physics and mathematics:

—I would like to add a little bit. Over the last 10 years, new methods for studying rock deformation during earthquakes have appeared. As it turned out, the region where the Rogun GES is located is a zone with very complex deformations and high tectonic stresses. The proximity of deep geological faults to the range, being in the "neighborhood" of smaller but seismically active breaks, create the probability of motion directly below the dam, which would be extremely dangerous. These data, unfortunately, have not been brought to the attention of the assessment group, and it is for this reason that I believe that without consideration of the new findings and without constant monitoring, a final decision on the dam's height cannot be made. Probably, we should already be thinking about the other side of the question now: does the republic need such a gigantic dam, does it need another aluminum plant, or more energy-intensive factories? All the more, as there is no raw material for them. Would it not be better to develop local light industry?

M. Burkhanova, Tajik SSR Committee on Environmental Protection Public Council Bureau member, candidate of economic sciences:

—The Rogun GES is being built here in the first place so that approximately 400 thousand hectares of new lands can be utilized in neighboring republics. If the Nurek GES works so erratically due to the fact that the waters accumulated in its reservoir have been going to irrigation for the greater part of a year, then what will happen with Rogun? After all, the Central Asian OES [Consolidated Regional Power System] is overflowing with hydraulic power. The energy system does not need the Rogun GES with its high peak power. All the more, as with the dessication of the Aral Sea, the introduction of new lands has been recognized to be inexpedient. We hope that this is the first stage of the assessment, as water acquired in such an expensive manner would add to the enormous outflow of underground reservoirs in the Amu-Darya basin, rather than promoting its rational utilization. We hope that this is the first stage of the assessment, as many factors have not been taken under consideration, the main one being the changed situation for our country's republics, the social and ecological issues. The Rogun GES is a child of the period of stagnation.

Solar power plants, windmills, small GES—where are they? Today, we already have damless (rotor) small GES, portable micro-GES, any, the tiniest hamlet can be assured light and heat. We take the least care of our people, we build giants, while how many places are there in the republic where people are sitting by firelight?

K. Sevenard, head consultant at the Tajik All-Union Trust for the Construction of Hydroelectric Power Plants and Facilities Productions-Supply Department [Tajikgidroeneregostroy PSO]:

—It is amazing: a country like Tajikistan that is so rich in water resources not having its own design institute. We pay enormous amounts of money for projects, and they are carried out without consideration of local conditions or any of the other things we have been speaking about here. And so problems arise—something is always being finished up, additional assessments are being conducted, and all of this requires money and large expenditures.

If the republic had its own design institute, the money would stay here and would be spent on other needs, of which we have many. Tajikistan holds second place for water resources. The money is, you could say, right under our feet, and still we walk around with our hands stretched

out. Now, we should be introducing a policy of hydroelectric development. GES with potential of 50 billion kilowatts per hour could be built on the Vakhshe, Pyandzhe and their tributaries. But if we had people working on these projects who had a personal interest in them, they would consider climatic conditions, the seismology, demography and sociology of this area. They would preserve the environment, the ecology, people would not be wandering all over the world, and money would be accumulating, which today is extremely important.

Hydroenergy is a perpetual engine, it is ecological and cheap. And if we develop it, our nation's welfare will improve. After all, labor resources can be used more efficiently. Singapore, Holland, Japan battle the sea for their tiny parcels of land, while we, also a country with little land, flood thousands and thousands of square km. Our way of thinking has not changed.

I. Pyankov, doctor of history:

—I sit and listen with great attention: almost all of the opinions have to do with the technical side of the issue. But why, back when construction was only in the planning stages, when the project was just being ordered, were the social, economic, cultural, demographic aspects not examined? We always relegate purely human problems to the back burner. But for what purpose do we do things—in this case, the construction of an energy giant? Is it not for the people? Unfortunately, it is this that we have forgotten.

I am surprised by one thing—why is the assessment being conducted towards the middle of construction and not long before it began? And why is it purely technical? Why are there not ecologists, sociologists, cultural activists, economists, seismologists, spiritual figures among the experts? Here is the answer: the project is unsuitable for work. To make a decision on such a serious matter purely pragmatically is unwise, to say the least. This is a region with a thousand-year history that has not been researched, and now it is to be buried under water. The Great Silk Route came this way; how many memorials to antiquity should have been uncovered, studied, recorded. To find the truth—that is the question. And it appears that nobody cares about it.

V. Grigoryeva, Tajik SSR All-Union Electrical Engineering Association [VEO] section chairman:

—The newspapers have been working for a long time to illuminate the problems of Rogun, Nurek, and other regions of the republic. But, as we have said here, everyting was done in secret; nobody intended to speak with the people, much less ask their advice. I think, post factum though it may be, that a sociological study and poll should be conducted in order to study people's opinions and propose an alternative. The human rather than the technocratic side of the problem must be placed on the scales.

After all, the centuries-old foundations of a people, a way of life are being disrupted. The people here (like nowhere else in the world) need no mansions; what is important to them are the graves of their loved ones, their family. More frightening than faults, salt "volcanos", or earthquakes is the tension that has been caused by our carelessness.

A. Yanshin:

I agree with all of the speakers. A study of the sociological aspects must be conducted, all of the opinions and suggestions expressed here must be systematized, a conclusion must be reached, and it must be published in the newspaper. We need a multilateral assessment.

Goskompriroda Chief Assesses Turkmenia's Environmental Problems

91WN0714B Ashkhabad KOMSOMOLETS TURKMENISTANA in Russian 1 Jul 91 p 8

[Article by T. Chorekliyev, Turkmen SSR Goskompriroda chairman: "Is There Reason for Optimism?"]

[Text] The declaration of Environmental Protection Day was the result of an increase in the work being done by millions of people to improve the ecological health of our planet, and of the recognition of high levels of public activism and the effectiveness of the grassroots environmental protection movement.

The situation that has developed in the environmental complex of Turkmenistan is making environmental protection a more and more necessary and urgent task here, as well. We have few reasons for optimism.

One of the serious problems is air pollution. Nobody needs to be convinced of the importance of clean air for the life and health of people, and the plant and animal world. Nevertheless, the republic's air reservoir is exposed to constant, concentrated negative influences.

Just last year, industrial enterprises, public utilities and other republic enterprises dumped 520 thousand tons of harmful substances into the atmosphere. Ten thousand sources of harmful emissions have been counted at the republic's enterprises, of which only 3850 are equipped with pollution control devices. The enterprises that represent the greatest ecological danger are equipped with purification devices. These are, for example, such places as the Chaodzhouskiy and Mariyskiy mineral fertilizer plants, the Krasnovodskiy oil refinery, the Bezmeinskiy cement factory, cotton-cleaning facilities and other enterprises.

However, for the most part, these protective devices are structurally and technically deficient, are not sufficiently effective, and are utilized without the necessary responsibility.

But this is not all. It is not a rare occurrence for the air to be polluted in greater volumes by automobiles than by

stationary sources. In 1990, 390 thousand tons of pollutants were emitted by automobiles. In the city of Ashkhabad, for example, gasses from automobile exhaust made up 70 percent of the total air pollution level. The situation is about the same in several other cities in the republic. Also, the gasses from automobile exhaust are more toxic that industrial emissions.

As tests have shown repeatedly, not less than half of the cars and motorcycles are running with poorly regulated fuel systems, which leas to a significance increase in the volumes of exhaust gasses, frequently of three-five or more times.

In accordance with government decree, every automobile facility with automobiles numbering 50 or more must have gas analysis devices, conduct regular test procedures, and prohibit vehicles with unregulated fuel systems from leaving the garage. However, as the tests show, this requirement is often violated, especially in automobile facilities like the Ministries of Agriculture, Highways, Construction, Industrial Materials and several others.

In this republic, issues concerning the switch for automobile transport to gaseous fuel and nonethyl types of gasoline are being dealt with slowly.

Polluted industrial and utilities outflows represent a serious danger to the environment. With every year, their effect on sources of water and land resources becomes more and more urgent. According to incomplete data, over 220 million cubic meters of untreated, frequently extremely poisonous industrial wastes are dumped into so-called accumulators, collectors, lowlands annually. The most "zealous" in this respect are the Maryyskiy leather works, the Krasnovodskiy oil refinery, the Maryyskiy primary wool-processing plant, several livestock farms, especially the Chardzhouskiy Oblast bird factory, construction materials plants, city utilities. In Tashauz, for example, purification devices have not been in operation for over 10 years.

The situation in the republic's agrarian sector causes special concern. At Agroprom's facilities, 10-12 thousand tons of pesticides are utilized yearly, as well as over 318 thousand tons of chemical fertilizer.

A significant portion of the pesticides and mineral fertilizers utilized in agriculture, along with drainage waters, end up in the Amu-Darya. According to incomplete data, over 3 billion cubic meters of highly mineralized, polluted waters are dumped yearly into our main water artery and other surface reservoirs in the republic. It has been established that one of the major causes for the growth in the sick rate as well as high child and maternal mortality is the constantly deteriorating quality of the water in surface reservoirs, the fact that the content of harmful substances, primarily nitrates, in plant and animal produce is above the standard level.

What is being done to rectify the situation?

As the central administrative organ in the area of environmental protection for the republic, the Turkmen SSR State Committee on Environmental Protection has formulated its structures, has staffed them with specialists and begun environmental protection work in a relatively short period of time.

In 1990, 706 industrial enterprises were inspected for their conpliance with environmental protection legislation, while storage, transportation and the utilization of mineral fertilizers and toxic chemicals were monitored at 216 agricultural enterprises and organizations. Together with organs of the MVD [Ministry of Internal Affairs], 141 automobile facilities were inspected. About 2045 officials and citizens were called to account, included 1050 for poaching and violating wildlife preserve policy. The total in fines and lawsuits exceeded 3 million. Operations at 40 enterprises, shops and combines were suspended, 40 materials were sent to investigative organs in order to bring the most malicious violators of environmental protection legislation to criminal justice.

Large-scale lawsuits were brought against the Chelekenskiy marine administration for exploratory drilling, Maryelektroset, the Chelekenskiy chemical plant, the Krasnovodskiy oil refinery, a military unit and several others.

We intend to direct our future efforts, as well, towards cracking down on violations, towards strict compliance with environmental protection legislation, towards supporting the efforts of state and public organizations, including informal organizations, in this area.

Specialists Propose 'Iceberg' Concept for Saving Aral Sea

91WN0742B Moscow ROSSISKAYA GAZETA in Russian 14 Aug 91 p 2

[Article by correspondent Vadim Ogurtsov: "Engineer Groman's 'Iceberg' Able To Water the Country's Dry Regions"]

[Text] **USSR Goskompriroda [State Environmental Committee] and the jury of an all-Union competition, have named a technical proposal by a group of specialists, based on many years of "private" research by Rostov engineers D. Groman, A. Bakalova, and V. Bakalov, among the best concepts for saving the Aral.**

We are sitting in the apartment of the former chief specialist of the Rostov Department of the Teploelektroproyekt [All-Union State Planning Institute on the Design of Electrical Equipment for Heat Engineering Installations], Dmitriy Sergeyevich Groman. He went on pension long ago, but to this day considers himself an engineer in the old sense of the word, when the title meant more a capability for technical strategy, than a readiness for the impassive, albeit competent, execution of someone's ideas.

This aspect of his nature doomed him to a thorny path. No one could force him to give up his convictions. From childhood, the man was accustomed to believing in his own reason, since the year 1920, when Moscow Cheka member Sergey Groman adopted and raised the four-year-old orphan. For many years now, he has unselfishly, if we speak of money, been working on an idea which he and wife Antonina Grigoryevna Bakalova call "ice thermics." Signs of an ancient irrigation system, found in Dzhugarskiy Alatau, suggested this idea to them back in 1943. It seemed that in the winter, water rolling down for no purpose, unneeded in the foothills, was diverted by this canal from the upper reaches of the river to a so-called command point. Here it became an artificial iceberg which, with the thaw in the summer, generously irrigated the dry fields of the foothills.

From here, it was not far to the idea of ice-thermic regulation and control [LRU]: Collect the excess flow from rivers and reservoirs, not needed for the national economy in the winter, freeze it for future use using the atmospheric cold and a plant, and systematically melt it in the summer in the necessary quantities.

Years passed. The idea became surrounded with questions and forced them to seek the answers in the layers of several mixed sciences at once. Until that degree of clarity, when the slightest of the questions disappeared, crossed out by profound and reliable knowledge... Once again let us open the stenographic record of a January day in 1975, when the idea's authors and representatives of academic and sectorial science met at the USSR GKNT [State Committee for Science and Technology] in order seriously to examine all this. Without going into particulars, it is possible to say that from the very start, the needle of the scale began to lean obviously toward "highly promising." That is, until the chief specialist of the All-Union Thermotechnical Institute, doctor of sciences L. Berman, put his argument in the other pan of the scale. He found a foreign publication which at once reduced to naught the entire practical meaning of the venture of A. Bakalova and D. Groman, engineers without a higher degree, and of their son Valeriy Bakalov, who was included in the work. At that time, how could they know that L. Berman had only "inexplicably trusted in" an article in an American journal, in which the cost of similar experiments in the state of Pennsylvania had been raised tenfold. He also translated the coefficient of efficiency incorrectly, having lowered it several-fold. These borrowed "arguments" were a heavy stone around the idea's neck.

However, the GKNT conference accepted this article as an axiom and its attitude toward D. Groman's idea was reduced to vague good wishes, such as "it is worthwhile to continue the search." Of course, this would be on his own, just as he had already done for 40 years in a row...

We are bending over a large-scale map of the country's high mountain regions, where ancient glaciers crawl as blue tongues in canyons, and from each extends a light blue thread of a beginning river. D. Groman repeats some "grammar school arithmetic" for me:

[Groman] The area of the glaciers is not really so large. Somewhat more than 19 square km. At the same time, they store 2,000 cubic km of water. The summer thaw gives about 20-25 cubic km annually, up to 40 percent of the summer flow of rivers of these regions. The center of the European part of the country, the Donbass, the Don River basin, the North Caucasus, Central Asia, and Kazakhstan are experiencing the most acute shortage of fresh water. Of the 140 million hectares suitable for irrigation, only 30 are actually supported.

The first practical attempts to control the thawing of glaciers (essentially the point was simply to accelerate it) were dictated by the knowledge of those years and the experience of the past war: by using smoke-screens and blackening powders. The methods turned out to be ecologically unsound and very expensive, and threatened the irrevocable eating away of the ages-old ices.

With the help of LRU, as the authors assert, it is possible in general to influence many natural processes and industrial technologies, which directly or indirectly are related to the circulation of water or shortage of water resources. The need for many expensive water reservoirs, dams, and other installations that regulate flow disappears. It is entirely permissible to place masses of ice on the most inconvenient and unsuitable lands. In mountain regions it is possible to artificially intensify snowfalls and avalanche flurries.

In the winter, it is worthwhile to freeze a man-made iceberg around a station, since in the summer the ice water will not only replenish its overall reserves, but will also increase the efficiency of the turbines by four-five percent. A. Bakalova and D. Groman developed the theory and technology for creating such ice storehouses, having defended them in 1971 for the author's certificate.

So, the idea was entered on the state register of inventions long ago. So long ago, that one does not ask why it is this way, and not demanded for practice. In 1979, a council for the study of production forces under USSR Gosplan seriously examined it, basically approved it, and recommended publication of the documents and their examination in the scientific council on the comprehensive use and safeguarding of water resources. The council in turn transferred responsibility for conclusions onto the shoulders of academic institutes. At that time, Goskomizobreteniy issued the authors yet another certificate in 1981—for an installation for the layered freezing of ice under natural conditions. No longer hoping for foreign thermal isolators, promised by someone, they are already on the verge of inventing an "ice storehouse, concealed from solar radiation by artificial, nontoxic refractory ice." Then, a reviewer from the USSR Academy of Sciences Institute of Water Problems, candidate of sciences V. Debolskiy, having made... a thousand-fold arithmetic mistake (?!), accused the

authors of maliciously exaggerating the effectiveness of the proposed installation. In truth, to lay the blame on someone else...

For many decades this idea has forced its way through the self-serving resistance of official institutes, committees, and ministries, lazy or unconscientious reviewers, and envious scientists. Recognition has begun to dawn only now. Last year, Gidrometeoizdat finally published the monograph, "Systematic Regulation of Mountain Glaciers and the Flow of Rivers" (authors V.D. Bakalov, D.S. Groman, M.Ch. Zalikhanov, and V.D. Panov). A journalistic essay on the idea's thorny fate was released by a Rostov publishing house. Now, USSR Goskompriroda is looking at LRU with great attention. Who knows, possibly, we will live until the first serious experiments, until a time when the waters of the high mountains will finally water the parched fields of our southern regions.

Scientist Advocates Theory of Aral, Caspian Sea Link

91WN0742A Moscow TRUD in Russian 12 Sep 91 p 8

[Interview with Magomed Mogutdinovich Alklychev, senior scientific associate, VNIPIgeoterm, by V. Naumov: "The Aral Is Falling Into the Caspian Sea! Scientist Magomed Alklychev Explains a Cause of the Ecological Catastrophe"]

[Text] The events of a strained political life have somehow drawn society's attention away from the natural disaster that has befallen the residents of the Aral area, as well as from the catastrophic rise in the level of the Caspian Sea. Thousands and thousands of families have been forced to abandon flooded homes, enterprises are closing down, port facilities are going out of commission, the petroleum industry is in a desperate situation, and gigantic areas of fields have been inundated with salt water. Without regard for social problems and economic damage, the Caspian is overflowing even further. On the other hand, the unfortunate Aral continues to dry up; the water continues to recede from settlements and cities which were once on its banks. Life in the desert, once the bottom of a sea, is dying out, and boats that no one needs any more are rusting.

Scientists explain the perfidious tricks of the one and the other reservoir variously. However, rather pessimistic prospects follow from their "diagnoses." The idea of redirecting Northern rivers, alas, is revived again and again as a method of "treatment." This idea, besides a loss of billions, threatens global ecological consequences in the future. M. Alklychev, senior scientific associate at VNIPIgeoterm [All-Union Geothermal Scientific Research and Planning Institute], has looked at the sources of the "disease" in a new way. Our TRUD special correspondent talks to him:

[Naumov] Your version, Magomed Mogutdinovich, reduces to the fact that an underground flow of water opened up between the Aral and the Caspian several years ago, and both catastrophes are explained by this one cause...

[Alklychev] There may be many causes. At the conference on the Caspian, held in Baku this year, many very likely hypotheses were advanced, and I would not try to refute any of them. For instance, it was stated that the Volga has become fuller, and I cannot deny this factor, although it is also obvious that Europe's largest river itself has not changed so much in recent years, that the Caspian, enormous in area, should overflow its banks. Rather, this is one of the "drops" which over-filled the "cup." Similarly, we should not disregard the mismanaged utilization of the waters of the Amu Darya and Syr Darya, which feed the Aral Sea. We should not simply absolutize one or another reason, including the one that I suggested. However, this reason, in my opinion, explains both tragedies well. The rise in the level of the Caspian and the almost complete disappearance of the Aral, I think, are interrelated.

[Naumov] The two seas were isolated for thousands of years. There would have to be a serious cause, in order for an underground river to suddenly appear...

[Alklychev] Well, for everything related to a sea, to land, to the bowels of the earth, a millennium is just an instant. It has been proven that both the Caspian and the Aral, in times that mankind does not remember, were parts of one body of water, the ancient Sarmatian Sea. Mighty layers of bottom deposits of both organic and mineral origin lie beneath the desert sands. These alluviums make up a "partition" between the seas. Porous, eaten away by caves, and rich in spongy "collectors" (hence the oil wealth of these places), these layers (not a rock monolith at all) comprise a "dam" between the Aral and the Caspian. Collapses of drilling rigs into empty cavities have even occurred in Guryev Oblast. That is the "isolation" here. In this regard, the mirror of the Aral is elevated more than 70 meters above the Caspian! This column of water constantly gropes for an exit and is ready to rush for freedom at the slightest leak. It is surprising not that the Aral is flowing away now, but that this wonder of nature has been preserved to this day...

Now, about that which might cause the formation of a water flow within the "dam." If we look at a geological map, the unstable base becomes apparent, on which that which we have conditionally called a dam is founded. It is known that the Earth's "armor," the upper part of its crust, is "paved" with plates which are in motion. Like broken ice on water, they vibrate, separate and shift. So, the gap between the Aral and the Caspian lies directly on a break in the lithospheric plates. Like gigantic clamps, they first squeeze, then release the porous mass of the sedimentary layers: They are "chewing" it. Even a barely noticeable shift may cause the most diverse and unpredictable changes in the depths of the earth, including the formation of such cracks, which would suddenly join two seas and make them into connecting vessels. The surprising similarity in the chemical composition of the

waters of the two seas indicates that such contact also arose in the past, possibly more than once. It is hard to explain this only by the common origin of the Aral and the Caspian, or even by the existence in not so distant times of the Uzba River, which connected the two seas, just as the Neva connects Ladoga to the Bay of Finland. Really, the level of the Caspian Sea in the course of millennia has risen and fallen many times already (which is in no way explained by man's economic activities). Most unfortunately, no information whatsoever has been preserved about fluctuations in the level of the Aral Sea. However, analysis of the geological situation shows that the seas, in all likelihood, do share an ancient interconnection.

[Naumov] To be honest, it is hard to get used to the idea that so much in our earthly fate is predetermined by nature. For decades we have boasted that "the frozen pole and the vault of blue" are under our mastery. Yet, it turns out that one sea is pouring into another, the water is crowding people out, and we are powerless to correct it.

[Alklychev] Well, that is not quite so...

[Naumov] You have suggestions concerning this?

[Alklychev] We must look for the flow itself. This is task number one, and it is entirely within the abilities of geologists and geophysicists. If the underground stream is a reality and it is found, we should arrange a gentle shaking up. For instance, we could drill a number of shallow wells and blast an explosive placed within them. I am certain that a slight mixing of the layers is sufficient to close the passage, which spontaneously appeared, for a century. You ask: Will this end the problem? I would say: Rather, the processes will lose their catastrophic nature, and this is quite important. I think that right now at least half of the Caspian's excess water is coming from the Aral.

Although other factors are operating, most of them are either temporary or can be eliminated. For instance, according to some data, a tremendous amount of the water that feeds the Aral Sea is lost due to the disorderly drilling of geothermal and artesian wells: The state ought to have its say here. For instance, as far as intensified solar activity, which influences the water balance, is concerned, this is a transient matter. If we eliminate the root of the problem, the situation will gradually normalize and the Caspian and Aral will return to their usual banks.

DENMARK

First Environmental Fine on Municipality Reported

91WN0744A Copenhagen BERLINGSKE TIDENDE in Danish 11 Sep 91 Sec I p 2

[Article by Hans Larsen: "First Municipality Sentenced for Environmental Infraction"]

[Text] **Roskilde—Gundso has been fined for not meeting waste water requirements.**

The municipality of Gundso must pay a fine of 150,000 kroner for allowing too much organic matter to flow into Hove Brook.

That was the decision in the first case brought against a municipality, which has been sentenced for not meeting county waste water requirements.

"We can now establish that the same rules apply to municipalities as to private firms that pollute the environment," says section chief Mogens Moe of the Environmental Administration.

Gundso has admitted the pollution, which has been going on for 10 years. The fine was set in a compromise with the Roskilde County inspection authority which had originally recommended that the municipality pay a fine of 200,000 kroner.

After receiving several directives from the former Metropolitan Council the county reported Gundso to the police in 1988. The municipality of Lejre was also involved in a case that year because waste water from two water treatment plants there exceeded the maximum limit.

In contrast to Gundso, Lejre chose to confront the county in court. The first court session has been set for 23 September and the case is expected to continue for several months before a decision is handed down.

In the future Gundso will pipe the waste water to a new treatment plant in Jyllinge that is capable of meeting the requirements that have been established.

FINLAND

Rock Burial for Nuclear Waste To Start in 1992

92WP0075A Helsinki HUFVUDSTADSBLADET in Swedish 1 Nov 91 p 6

[Article by Annika Hallsten: "Where Can We Store Highly Active Nuclear Waste?"]

[Text] On Thursday, outside the nuclear power plant at Olkiluoto, a cave excavated 70-100 meters under the mountain was dedicated for a trial run.

The cave will serve as a storage area for medium and highly active nuclear waste. That means that, for example, clothing, tools, and waste which contain radioactive material will be permanently stored in this cave, packed in barrels.

The cave is Finland's final storage facility for nuclear waste and will start operations next year.

So, even if this cave had been conceived solely for nuclear waste which contains fractions of the radioactivity which the highly active nuclear waste contains (one-thousandth part in the case of medium active waste and one-millionth part in the case of low-level waste), it heralds what is to come—namely a final storage place for highly active nuclear waste.

"The Industrial Power [Company] is incompetent when it comes to handling nuclear waste. State control does not work. The company should immediately be relieved of the practical details of handling waste. Geologists, land surveyors, and drilling experts could take care of this task."

On Thursday Pekka Suominen, an associate professor at Jyvaskyla University, was one of those experts who testified before Parliament's standing committee on the environment on highly active nuclear waste and final storage of the same.

The issue is thus beginning to be a pressing one in Finland. By the year 2000 the country must decide what is to become of the highly active nuclear waste from the nuclear reactors at Olkiluoto.

The nuclear power plant produces 45 tons, or 20 cubic meters, of used nuclear fuel each year. By the middle of the next century, nuclear waste produced for decades will be stored someplace forever. Some talk about tens of thousands of years, others about millions of years.

Two alternatives are possible. Either the waste can be sent abroad (which is the case with the highly active waste from the nuclear power plant in Loviisa) or it can be stored underground in Finnish caves.

Where Olkiluoto is concerned, it is this latter alternative which seems to be the most appropriate. If so, the waste, which, in other words, would be used nuclear fuel, would end up in copper capsules 500 meters under the mountain.

"The ground underneath Finland's mountains is fairly first-rate for the final storage of nuclear waste," said Professor Heikki Niini of the Technical University.

Currently Industrial Power is doing test drilling of the ground underneath mountains at five different sites in Finland. These places are Hyrynsalmi, Sievi, Kuhmo, Konginkangas, and Eurajoki.

Assistant Professor Pekka Suominen is extremely critical of the choice of sites.

"Industial Power has not paid attention to the geology in its selection of sites. All five are second-class sites though first-class sites exist. Why do we have first-rate geologists at all?"

Factors which must be taken into consideration when deciding on final storage are whether the ground underneath the mountain will in fact remain stable for ten thousand, a hundred thousand, and millions of years into the future, whether the copper capsules will not burst, and whether the uranium will not seep out into the ground water. An earthquake or a bomb attack could have consequences which are worse than we can predict. A number of experts point to the role of ground water as decisive, even if the capsules did not burst.

"The storage areas cannot be kept dry, water will get in," said Juhani Kakkuri, director of the Geodetic Research Institution.

Kakkuri is one of those saying that a new risk analysis ought to be done—the analysis which exists is outdated in this respect.

The copper capsules are protected against moisture by being packed in bentonite, which is a type of clay which swells when it gets wet. The underground passageways and shafts as well are completely packed with a mixture of sand and bentonite to protect them against possible moisture.

Naturally there are still doubts as to whether bentonite will hold up.

"But bentonite is stable. Those doubts stem from experiments conducted under temperatures which were significantly higher than what is usual in Finland," said Dr. Seppo Vuori, an engineer at the Central State Research Center.

Professor Heikki Niini again points out that since ground water at a depth of 500 meters moves very slowly and since uranium does not dissolve easily in ground water, the danger of radioactive materials' reaching the biosphere is nonexistent.

In this respect, owing to the Chernobyl nuclear power plant disaster, the consequences of excessive radiation are well known to everyone. Radiation causes cancer and genetic and fetal damage.

Imatra Power and Industrial Power believe that in technical terms a secure final storage facility has been achieved. Others believe that even if currently available reports indicate that final storage of highly active nuclear waste at a depth of 500 meters underground is a secure method, comprehensive supplementary reports are needed.

"We fall short of the safety limits according to current reports, but these are still uncertain," said chief inspector Esko Ruohola of the Central Radiation Safety [Institute].

Thus opponents of nuclear energy are cautioning against hasty decisions. "The most important thing is that we not tie ourselves to one decision yet," said Juha Saarinen of the Energy Policy Federation—Alternatives to Nuclear Energy.

Before highly active nuclear waste is finally stored, it must cool down for 40 years. While it awaits final storage, used uranium fuel is packed in barrels which are first stored in a pool of water on the premises of the nuclear power plant. The waste is then placed in an intermediate storage area to await final storage.

According to the current timetable, the authorization to construct the nuclear waste storage facility is to be granted by the year 2010 at the latest. Ten years later the final storage facility is supposed to be completed and ready to be used.

The timetable could be moved up. According to Veikko Ryhonen, an engineer at Industrial Power, the waste can be stored in intermediate storage for 100 years.

GERMANY

Siemens Develops Highly Sensitive Exhaust Sensor

91WS0467X Toddington NEW MATERIALS INTERNATIONAL in English Jul 91 p 4

[Article: "Exhaust Sensor Response Time Cut Tenfold"]

[Text] Siemens has developed a vehicle exhaust sensor made of thin ceramic film which is claimed to achieve response time of less than 10ms and to operate at temperatures of up to 1,000°C. allowing individual control of the combustion process in each cylinder of a car engine.

The sensor was developed at Siemens' research laboratories in Munich. It allows the engine control system to reduce the proportion of polluting gases such as C_xH_y, CO_x and NO_x.

The response time compares with the 100ms of the lambda probe made of zirconium dioxide which is normally used to measure the composition of the exhaust gases in vehicles with three-way catalytic converters. The engine control system sets the mixture composition according to this delayed response, and therefore cannot optimise the combustion process in each cylinder.

The short response time of the new sensors is a result of the reduced thickness of the sensor film consisting of a semiconducting metal oxide. The sensors are about three-thousand times thinner than conventional lambda sensors.

Interconnections made of noble metals and located on the sensor film act as heating elements or temperature sensors and keep the sensor at a constant temperature of approximately 1,000°C.

Hoechst AG Developes PVC Recycling Process

91MI0459A Bonn DIE WELT in German
2 Aug 91 p 17

[Article by Arno Nodelchen: "Hoechst Wants Recycling Instead of a Ban on PVC"]

[Text] To avoid the need to dump used adhesive tape, in accordance with the current waste disposal regulations, engineers at Hoechst AG have developed a method for reprocessing industrial and household waste containing polymer adhesives.

The adhesive tapes currently used in the packaging industry and for household purposes consist largely of polyvinyl chloride (PVC foils) with polymer adhesives. Unfortunately they have proved disruptive and difficult to process both in production and in numerous domestic and other types of industrial waste, although their mechanical properties far outdid those of all adhesive paper tapes used to date in terms of strength and resistance.

The results available so far are very encouraging and show that PVC alone with adhesive admixtures can be processed relatively easily and inexpensively.

However, this does not apply to other plastics in current use in the packaging industry. A process that uses suitable solvents or other hydrocarbons to remove the adhesive from these foils, after which it can be resold as an adhesive, points the way to other new plastics reconditioning processes.

Once the adhesive has been removed PVC is available for reuse and, as a raw material in powdered form, can be reprocessed to foils or other PVC products. Both recycled products are already being studied and tested in the field. Of course, it is still too early to cost them accurately, but it appears that they can be made resaleable at realistic market prices once the processing plants concerned are running.

The process was developed with completely clean industrial waste from the packaging tape manufacturing line. As with other PVC reprocessing techniques, this involves only low sorting and washing costs. In the view of the specialists, the process will have to be considerably modified if mixed industrial or household waste is to be recycled.

Considerable quantities of packaging tape with adhesive attached to it can also occur in cardboard packaging recycling. However, it takes another form and is normally still mixed with other plastics. Nevertheless, the specialists believe that it will be possible to process even this mixture in the near future.

Hoechst AG currently estimates that about 5,000 to 6,000 tonnes of waste containing PVC can be processed annually. Adhesive-coated PVC tapes from industrial waste account for about a thousand tonnes of this. 500 tonnes more could come from the waste paper recycling undertaken by the cardboard mills.

Five and a quarter inch computer diskettes and PVC foil mixed with wood from the furniture industry can also be recycled, as can PVC mixed with aluminum. The estimated 1,000 tonnes of the latter are mainly made up of tablet packaging, which could be collected via pharmacies and hospitals.

Although processing packaging tapes into reusable PVC and adhesives is therefore ideal, the same does not always apply to other PVC waste. However, chemical engineers have found out that a whole cascade of short-term and long-term products can be produced with recycled PVC, because finely ground recycled PVC can be remolded and can then also be used for long-life applications. Short-life foils would then be at the beginning of the cascade, with sections or panels for the building industry at the end of it.

Energy Storage Research Project Developing Battery With Ceramic

91WS0528X Berlin ING DIGEST in German
Aug 91 p 13

[Article by RTL: "Battery With Ceramics Lighter and More Efficient"]

[Text] There is no question that energy storage is a key technology, important for the economical utilization of renewable energies such as sun and wind, for meeting peak demand for power in conventional power plants, and for using electric vehicles. The Federal Ministry for Research and Technology (BMFT) has spent 170 million German marks [DM] on research since the mid-1970's.

One of the supported projects is development of the sodium/sulfur high-energy battery. This project uses the electrochemical system of sodium and sulfur in combination with a specially developed solid state electrolyte of ceramic (β-aluminum). The ceramic forms the core and because of its conductivity for sodium ions makes the unique conditions of this battery possible: They consist of a very high energy density with high efficency and freedom from maintenance. In comparison with the lead battery, for the same energy content one-fourth of the weight is needed and half the construction volume.

This results in new opportunities particularly in the mobile application field. Electric cars are given more acceptable range and power. In the central cities, in particular, the use of electric cars, battery-operated busses and transport vehicles would lead to a noticeable reduction in emissions and noise. Operation of electric commuter systems would be possible without overhead lines. Electrically operated fork trucks could also be capable of greater efficiency and achieve longer operating times with the new battery. That would make it possible also to use them for emission-free transportation of heavy loads in closed spaces. Finally, use of the

battery in electric boats would represent an interesting application designed to protect the waters.

Intermediate-size passenger cars powered by such a high-energy battery, according to their design can reach (as tested by the BMFT's willingness to drive them in daily operation), a maximum speed of 120 km/h with a range of 150 to 200 km. Acceleration from 0 to 50 km/h, that is to say the normal maximum speed permitted in city traffic, is 7 seconds. Over a driving distance of 100 km, a medium-sized passenger car needs an average of about 25 kilowatt-hours of energy, which, depending on the rate, cost about DM5 per hour. Charging an empty battery at a household outlet takes up to eight hours. For quick charges the loading time can be cut to 90 minutes. The battery can be recharged approximately 1,000 times. This corresponds with a driving distance of 150,000 km. Discarding such a battery at the end of its lifetime has also been solved: 97 percent of the battery materials can be reused. At present, work is under way on large-scale production of the new battery by the mid-1990's.

The Federal Ministry for Research and Technology has already become a participant as a funding source for the development of a ZEBRA battery and has supported the heat storage project. It has produced the concept of earth and aquifer storage cells, which are charged through solar collectors in spring and summer. During the heating period, the stored heat is used by means of heat pumps in order to heat rooms. Proportions of 50 to 70 percent solar heat of the total heating requirement are technically possible for buildings in the FRG. Stuttgart University has acquired special merits in this development. Work on high-energy batteries is also under way abroad, for example in the United States, in Japan and England. In the United States, for example, three vehicle manufacturers have established a research consortium.

Renewable Energy Research Status, Prospects

91MI0511X Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German 26 Aug 91 pp 5-8

[Text] In recent years, renewable energies have received a significant boost in the Federal Republic, shown both in the public's positive perception of them, and in the increased financial support they have received.

While the Federal Ministry of Research and Technology (BMFT) spent a total of 244.5 million German marks [DM] during 1990 on renewable energies and rational energy utilization, a total of DM318 million are earmarked for this purpose for 1991, representing a rise of over DM70 million or around 30 percent. To these figures are added some DM30 million spent annually by the major research institutes in recent years on renewable energies and rational energy utilization. The laender have also increased their funding for these areas in recent years, and the Federal Republic of Germany, with the United States and Japan, is one of the top countries that have expressly committed themselves to the further development of renewable energies.

The Federal Government's target is to increase significantly the contribution made by renewable energies to meeting primary energy needs from its current level of approximately 2.5 percent during the coming years and decades. Studies predict that by the year 2010 the contribution made by renewable energies to meeting primary energy needs could be increased to 10 percent—which means, however, that 90 percent of energy needs would still have to be met in other ways. The increased use of renewable energies in place of fossil fuels will assist in reducing CO_2 emissions, which are largely responsible for the greenhouse effect and for environmental pollution. In November 1990 the Federal Government decided that CO_2 emissions should be reduced by 25 to 30 percent by the year 2010, a target to which renewable energies are expected to make a significant contribution.

Renewable energies have gained an equally firm foothold in the new laender. The measures taken by the former GDR were confined largely to the fields of geothermics and biomass; in recent months, however, success has been achieved in gradually extending activities in the new laender to include the whole field of renewable energies and rational energy utilization.

Geothermics

Unification gave geothermics a new dimension. Hitherto, the main thrust both in the Federal Republic of Germany and internationally had been the hot dry rock process, which seeks to utilize heated water at depths of 5000 to 6000 meters at surface temperatures in excess of 180° C to generate electricity. An attempt is being made to set up a pilot plant, which might be based either in Bad Urach (Germany), Soultz-Sous-Forets (France), or Cornwall (great Britain). The three sites are presently being investigated by a consortium of European firms with funding from the European Community.

Three geothermal heating plants were set up in the former GDR, not only to generate electricity, which requires high temperatures, but also for supplying hot water at temperatures between 60 and 80° C, at Waren (5 MW(Th)[megawatt thermal]) in 1984, and at Prenzlau (7 MW(Th)) and Neubrandenburg (10 MW(Th)) in 1988. A number of sites were also investigated, and some boreholes were sunk.

Immediately after unification a series of studies were undertaken, supported by expenditure of over DM3 million primarily at Neubrandenburg Geothermics GmbH, with the aim of devising basic procedures for modernizing obsolete plants and setting up a new plant. The BMFT has agreed in principle to support the modernization of an obsolete plant and the establishment of a new one, provided a sponsor who is willing and able to operate the plants on the long term can be found. The studies of obsolete plants will shortly reach their conclusion, to be followed without delay by their evaluation.

Solar Energy

Most financial support goes towards the development of photovoltaics, accounting for some DM100 million annually. There is scarcely any type of photoelectric cell that is not receiving BMFT support. The efficiency of most types of photoelectric cell has been substantially improved, with European laboratory records set for gallium arsenide cells (22.3 percent) and, a few weeks ago, for monocrystalline silicon cells (20.3 percent) at the Institute of Solar Energy Systems at Freiburg. Further improvements in efficiency are still required however, in order to make photoelectric cells more economically viable. To achieve this, demonstration projects are especially important, with the plants at Pellworm, Fehmarn, Kobern-Gondurf, and Neunburg vorm Wald enjoying a reputation that extends far beyond specialist circles. At Korkwitz- Ribnitz-Damgarten, near Rostock, a photovoltaic, wind, and biogas plant is to be set up to supply the electricity requirements of a sewage plant at Fehmarn.

The range of applications for photovoltaics is growing steadily, ranging from pocket calculators, radios, and TV's, to photovoltaic water pumps and lights, to solar-powered automobiles. The victory achieved by a solar-powered vehicle equipped with German solar cells at the World Solar Challenge 1990 in Australia on 15 November 1990 may be considered a particular success for German solar technology, with the solar automobile passing the finishing post at the end of the 3,000-km course with a lead of several hundred km.

A further interesting development is the "Solist" solar-powered boat funded by the BMFT with a DM200,000 subsidy, which is designed to carry a maximum of four persons and is propelled solely by solar power, i.e., without auxiliary mains or aggregate charging. Except during the winter months, it can run on its batteries for up to four hours a day. Water pollution of any kind is ruled out by the use of a completely oil- and grease-free rudder propeller. Among the solar-powered boat's special features are its quietness, lack of exhaust fumes, and smooth ride, while embankments and, consequently, flora and fauna are not exposed to excess wash.

One of the BMFT demonstration programs that has attracted particular attention is the "Federal Government/Laender 1,000-Roof Photovoltaic Program," which was initiated on 23 september 1990, and has been extended to the new laender since 1 July 1991. Each new land is receiving an allocation of 150 plants, with a 60 percent BMFT subsidy, as opposed to 50 percent in the older laender. The fact that all 16 are active participants in the program is particularly gratifying. A total of 2,250 photovoltaic units, each having an output of 1 to 5 kW, are being installed mainly on the roofs of one- and two-family houses, 1,500 of which are in the old and 750 in the new laender.

In addition, and specifically in the new laender, another two photovoltaic demonstration units, with high levels of efficiency in widely varying fields of application, are being funded; applications will be considered and selections made at the end of September.

Wind Energy

In addition to the photovoltaic field, wind energy has aroused a great deal of public interest, and is presently being funded by the BMFT to the tune of DM30 million annually. After hydraulic power, wind energy comes the closest among renewable energies to being economically viable. Electricity generation costs of 20 pfennigs per KwH can already be achieved with medium-sized plants (100 to 300 kW) sited at windy locations on the coast or offshore islands.

The 100-MW wind program initiated on 4 June 1989, and expanded into 1 250-MW program from 1 March 1991, has proved particularly successful. Despite its expansion, the project has not been able to keep pace with the large number of applications still being submitted. No further expansion is planned for the foreseeable future. It is gratifying that the great interest in wind energy extends to the new laender; Mecklenburg-Vorpommern is in third place behind Schleswig-Holstein and Lower Saxony in the capacity for which it has applied, and in fourth place in the number of applications made.

Hydrogen

Hydrogen has the long-term potential to make an important contribution to energy management, and more than DM20 million are earmarked for this field this year. As confirmed recently at the Eight World Hydrogen Conference in Hawaii, the Federal Republic of Germany is the world leader in the field. The best-known projects are the Solar-Hydrogen Bavaria GmbH solar hydrogen plant at Neunburg vorm Wald, the German-Saudi Arabian HYSOLAR solar-hydrogen project, and the hydrogen project forming part of the Euro-Quebec Study.

Water electrolysis is of special importance, being at present the only practicable large-scale process for converting electrical energy into hydrogen. The BMFT has for some years been supporting this sector, from Hot Elly (high temperature electrolysis of steam) to advanced electrolysis systems. In August 1988 the Munich-based Company for High-Capacity Electrolyzers for Hydrogen Generation Ltd. was set up by MBB, Line AG, and HEW with the sole aim of developing this sector, initially by developing a kilowatt-range prototype and subsequently by designing a demonstration plant in the megawatt range.

Fuel Cells and Energy Storage

In 10 to 15 years, fuel cells will already have been developed to the stage where they can make a substantial contribution to reducing CO_2. Fuel calls with their substantially higher efficiency as compared with thermal combustion, enable hydrogen, natural gas, and coal gas

to be converted into electricity. The greatest potential lies in high-temperature fuel cells, i.e., oxide ceramic and fused carbonate fuel cells.

The development of energy storage systems is very important for the future of renewable energies. The BMFT has for some 10 years been funding the development of NaS (sodium-sulphur) accumulators, which are already been tested in prototype vehicles and will be utilized in electric cars and electric boats in the next few years.

International Cooperation

On a European level, numerous projects for developing renewable energy sources have received joint funding from the EC and the BMFT, ranging from the two 1.2-MW wind energy sister plants in northwest Spain and on Heligoland to the photovoltaic and wind plant at Pellworm. Further joint projects are in preparation, as the expression of continual close cooperation between the Federal Republic of Germany and the European Community.

The BMFT attaches particular importance to close cooperation with the third world. Since 1974, some DM850 million have been spent on projects of direct or indirect benefit to third-world countries, including some DM250 million for solar power stations and for photovoltaic, wind energy, and hydrogen projects, solar village projects, etc.

Of particular importance in this connection is the German-Spanish solar center at Almeria (Spain), which is primarily the site for medium- and high-temperature solar heating projects.

Environmental Impact of Electric Cars Assessed

91MI0512X Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German 26 Aug 91 pp 8-9

[Text] What will be the effect on road transport of electric vehicles, and to what extent can solar (photovoltaic) energy be used for their energy supply? Using the example of road traffic in the Cologne urban area, the Rhineland TUV [Technical Monitoring Department], acting on behalf of the BMFT [Federal Ministry of Research and Technology], investigated the extent to which the use of electric cars influenced emissions of airborne noxious substances such as carbon dioxide, carbon monoxide, hydrocarbons, or nitrogen oxide. Various development scenarios were used to test the effects of the use of electric cars in future road transport.

One scenario assumes that journeys of a single distance up to 15 km are made using electric vehicles. In a second scenario it is assumed that only electric vehicles are used as private automobiles. In the first variant, up to 38 percent of all km covered in automobiles take place using electric vehicles; the second variant assumes 85 percent. Using these premises, the study reaches the following conclusions:

- The use of electric vehicles has a favorable effect on emissions of the above airborne noxious substances only if the electrical energy for the vehicles derives from energy sources which do not emit such substances.
- If the energy for electric vehicles in Germany were to be derived entirely from the main electrical network, then the calculations of the Rhineland TUV reach a remarkable conclusion: Owing to the high proportion of fossil fuel-driven power stations used in the generation of electricity, the total emissions of carbon dioxide and sulphur dioxide would rise in comparison to the scenarios without electric vehicles.
- The limited use of electric vehicles in so-called "niche usage," eg for transport and service journeys within a close vicinity, would however assist in improving the situation regarding localized emissions. The energy derived from the main electrical supply for niche usage would have hardly any effect on related power station emissions. Vehicles suitable for these purposes already exist.

The findings of the Rhineland TUV concerning the contribution of solar energy to electric vehicle propulsion are as follows: Independent solar vehicles, which derive their propulsive energy only from solar cells mounted on the vehicle itself, are not suited to the daily usage forming the basis of the study. The surfaces usable for solar cells are not large enough on conventional vehicles to provide sufficient energy for propulsion. Electric vehicles are suitable for daily operation in road transport only if they derive their energy from an onboard battery which is charged at a charging station. Such electric vehicles are available today in a number of models.

If the intention were to supply the charging stations the whole year round entirely on house roofs, then according to the calculations of the Rhineland TUV, the roof surface within the Cologne conurbation would be nowhere near adequate for this purpose. Energy from the public main supply would have to be used in addition to drive the electric vehicles.

A possible combined usage of main electricity and solar energy would involve the use of main-connected photovoltaic equipment, as tried out in the "Federal Laender 1,000 Roof Photovoltaic Program" for example. The charging stations of the electric automobiles could draw their energy from the main electricity, which would be generating at least a small part of its energy from solar plants. The main would thus be fulfilling a buffer function and evening out the solar rays' daily and yearly rhythm. The solar electricity stored in the main can naturally be utilized for any application. Solar energy plants connected to the main supply therefore do not need to be the subject of any special investigation relative specifically to electric automobiles.

The BMFT is concentrating its support for electric vehicles particularly on overcoming their hitherto still considerable disadvantages, namely the greater weight caused by the batteries and their comparatively low range. Its funding is being concentrated especially on the development of high-energy batteries, particularly sodium sulphur and sodium nickel chloride batteries, capable of extending the vehicles' cruising range and thus their range of applications.

Further information may be obtained from Dr. Wessels at the Rhineland TUV e.V., Institute for Environmental Protection and Energy Technology, Am Grauen Stein 5000 Cologne 91; tel 0221 806 2476 2477.

Researchers Identify Protein Molecules for Water Purification

91P60271X Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 28 Aug 91 p 8

[Text] By applying genetic engineering, researchers in Karlsruhe hope to make drinking water in Third World countries more palatable and healthier. Scientists at the Federal Institute for Nutrition have identified a substance, derived from the seeds of a plant which is indigenous to the Sudan, which acts as a flocculent. They are now entertaining the notion of genetically engineering the substance.

For day-to-day use, many people in Third World countries draw water from rivers, ponds or from wells dug by hand. This often rather cloudy water exhibits a high solid content which can be as high as 50 grams per liter of water. Moreover, the water, polluted by human and animal fecal matter, is highly contaminated with pathogens, particularly bacteria.

For millenia, people relying on this water for life have had traditions for the purification of water, at least to the point where it appears largely clear. The methods range from the admixture of earth from termite mounds, to the use of the mucous membranes of certain fishes to sap from plant stems and seeds. The use of the crushed seeds of the horseradish plant, Moringa oleifera, used by the people of the Sudan for purifying water, was of particular interest to the researchers from Karlsruhe.

Even the Arabic name "the clarifying tree" is indicative of the application of this prodigiously blossoming plant. Even two or three moringa seeds in a small cloth sack, placed into a vesel for water purification, suffice to clarify four liters of cloudy well water and to convert it into tasteless drinking water. The freshly purified water not only looks more appetizing but is also hygienically purer than the murky well water, since, flocculation removes up to 90 percent of the germs in the unprocessed water.

U. Gassenschmidt and his colleagues from the Federal Institute for Nutrition Research identified that substance, from the seed of the moringa plant, responsible for the flocculation. It is a small protein molecule consisting of a chain of 60 amino acids. The good flocculative behavior of the protein often depends upon the charge density in the molecule. For purifying drinking water, altogether larger quantities of the purified material must be added.

Recovery of the requisite quantities from moringa seeds is time-consuming and costly. Thus, the Karlsruhe researchers wish to identify the gene for the flocculent protein, culture it in E. coli bacteria and then use the resultant cells for producing the desired material. In this way, they hope to economize on flocculents recovered using less favorable techniques, i.e., aluminum compounds or polyacrylamide polymers, which are today used for simple drinking water processing.

Recycling Initiatives for Electronics Products Gaining Momentum

92WS0027A Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 17 Sep 91 p 8

[Article by Klaus Hieronymi: "Legal Initiatives Make the Reuse of Discarded Computers Increasingly Imminent: Discussion of Plan for Recycling Electronic Equipment—Improper Disposal of Computers and Peripheral Equipment Poses Serious Threat to Environment"]

[Text] Several weeks ago, the Federal Ministry for Environment, Nature Conservation & Reactor Safety (BMU) announced a statute requiring the recycling of electronic equipment. Are they on the right path? The core of the plan is a requirement that manufacturers and businesses accept, free of charge, electronic equipment—from electronic toys to household appliances, televisions to mainframes—back for recycling. The plan also includes regulations requiring environmentally sound design and the use of environmentally safe materials. The manufacturer is required to reuse raw materials and components and, where this is not possible, to dispose of the remnants in an environmentally sound manner.

The plan is part of an intensive effort by the BMU to make businesses also responsible for the final disposal of the products they put on the market. This obligation has been provided for in the waste law since 1896. In principle, this effort should be welcomed. The growth of mountains of rubbish, to which electronic waste also contributes, must be curbed drastically as soon as possible. According to cautious estimations by experts—concrete data is unavailable—approximately one million tonnes of electronic waste was "disposed of" last year, primarily as household trash. Only a very small percentage was disposed of through junk dealers. Computer waste is presently estimated at five percent; however, this figure is expected to increase sharply during the coming year. Only then will the waste sector begin to feel the effects of the "massive computerization," which began in the eighties with home computers, personal computers, departmental computers, and workstations. The improper disposal of computers and peripherals, for example as household trash, can pose

a serious threat to the environment. Computers are normally equipped with batteries containing cadmium or other heavy metals. Picture tubes consist of lead glass, and their coatings contain poisonous substances. The plastics from which the boards and casings are made are treated with flame retardants consisting predominantly or organic bromine and chlorine compounds. This is particularly true of older machines. Improper burning of these plastics can produce tetrachlordibenzo-p-dioxin and synthetics.

In any case, used equipment also contains many valuable, reusable, substances. First of all, there are the components themselves. After careful overhaul and intensive testing, they can be reused as repair parts. This can extend the lifetime of the original computer, and is particularly important if replacement parts are no longer available. Standard components such as power supplies and integrated circuits, similarly overhauled, can be used in the production of household appliances or even toys.

There are still many unsolved problems associated with the BMU plan. For example, there is no comprehensive logistical system for returning used equipment. If wholesalers and retailers are to be responsible for accepting back the used equipment, they will have to establish additional temporary storage areas for it. The customer, on the other hand, will be required to return the old equipment to the business that is responsible for that product. For organizational reasons, neither is possible.

There are no specialized or, above all, reliable firms which sort used appliances and separate them into reusable or recyclable components. Those that do exist have—with a few exceptions—a "scrapyard flavor." They are not serious partners for the reuse of used computers. Furthermore, there are no tested methods for the reuse of picture tubes, for the environmentally sound extraction of precious metals, or for the recycling or disposal of flame retardant-treated plastics. Nor is there exact data on exactly how much used equipment is accruing. But it is this which is the basis for any determination of the economic feasibility of recycling programs.

There is a lack of guidance for the development of environmentally safe, reusable, and recyclable computer products. Furthermore, it must be determined how to charge manufacturers or importers, who may no longer be in business when their products require recycling, in advance. There are no regulations requiring manufacturers or importers to provide detailed documentation of the components of their products. Last but not least, there is a lack of a general understanding of "the recycling of used equipment" within the corporate boardrooms of many computer manufacturers. MIPS and megabytes are still the primary objective of product development. Environmental safety is of secondary importance.

As has been demonstrated in the automobile industry, the individual manufacturers are unable to solve these problems on their own. Most recently, the regulation that states that an appliance, regardless of its make, may be returned to a business where similar appliances are manufactured or sold has made an autonomous solution by individual manufacturers impossible. For example, a personal computer can be turned in to a manufacturer of personal computers; a desktop printer can be turned in to a printer manufacturer; however, a television cannot be turned in to a terminal manufacturer.

The following is a possible scenario for solving these difficulties. An enterprise run, in cooperation with the BMU, by manufacturers and their associations would be responsible for accepting used electronic equipment. This enterprise, "Computer Recycling GmbH ," would develop a logistical system for accepting the equipment, possibly incorporating the local garbage disposal service. The first step would be to sort the used equipment and return to the manufacturers any computers that they have expressed an interest in recycling. The manufacturers could then reuse the computer or dismantle it for replacement parts.

The remaining equipment would be dismantled into various parts. This could take place either in the enterprise itself or in licensed subcontracting firms. The remnants would be properly disposed of. A research institute attached to the computer recycling enterprise would conduct research into possible recycling procedures and environmentally sound computer design. It would also establish the corresponding guidelines that would be used to assess newly marketed computer products on the basis of their later recycling costs. This assessment would be used to establish a fee, which the manufacturer or importer would have to pay to the computer recycling enterprise for each piece of equipment that it put on the market. This fee would serve to offset the expenses of the recycling enterprise.

The assessment would be linked to a certification, comparable to the license issued by the Federal Bureau for Telecommunications. The certification would be based on a detailed list of the components of a piece of equipment as well as their chemical recipe. Thus it would always be possible to determine to what extent an appliance was recyclable. The computer recycling enterprise would be financed by the proceeds from the sale of raw materials and from the fees that the manufacturers would be charged for each appliance they put on the market.

This scenario would solve nearly all the problems. It would be to the best interest of the computer manufacturer to develop products which are environmentally sound and lend themselves to recycling, as the easier a piece of equipment was to recycle, the lower the corresponding fee. Data on the number of products on the market and their components would be available. Used equipment would be available to manufacturers for reuse and extraction of replacement parts. The fee would

be charged either at the end of the production process, or upon sale of the item, so that firms that are unable to obtain a share in the market would still contribute to the cost of the recycling program. Central responsibility and the affiliation of the research institute would ensure that only the best recycling procedures were used. In cooperation with the manufacturers, the research institute would conduct basic research into environmentally safe computer manufacturing. Because the enterprise would be organized as a private enterprise, the development of a "Monster Bureaucracy," with all the associated drawbacks, would be avoided. At this time, a recycling program administered in conjunction with manufacturers appears to be the only path to a long-term solution of the problem of the disposal of used computers.

NETHERLANDS

PRISMA Project Proves Feasibility of Industrial Waste Prevention

91WS0467D Zoetermeer SCIENCE POLICY IN THE NETHERLANDS in English Jun 91 pp 15-17

[Article by Martijn van Calmthout: "Preventing Industrial Waste: Customised To Pay"]

[Text] Preventing the production of industrial waste is preferable to having to process it. And it can work out cheaper too. All the same, waste prevention has remained in the wilderness for a long time. Industry has remained wary, and the government's preventive policy is less advanced than national environmental plans would have us believe.

The Netherlands Organization for Technological Assessment (NOTA), in conjunction with universities and research bodies, recently launched the PRISMA Project, a study conducted in ten industrial plants of how waste products and noxious emissions can be prevented in practice. In March, PRISMA's results were presented to Parliament. 'It is obvious that waste prevention is possible, but apparently not so obvious as to make people go ahead and do it. Executives and managers need persuasion. With PRISMA, we've shown that it can be done, as well as how it can be done and that it's worth doing,' says NOTA's Sybren de Hoo in The Hague.

In March, Parliament received a final report on PRISMA (a Dutch acronym for 'Project on Industrial Successes With Waste Prevention'). The project was conducted under the auspices of NOTA. The report's main message is that the prevention of waste products and noxious emissions is a feasible and affordable way to achieve sustainability in the manufacturing industries.

De Hoo is quick to point out, however, that it is a report with a price tag. 'One of the ways of really getting waste prevention off the ground is to set up technological and organizational assistance programs, with a network of advisers. Implementation of the report's recommendations would require about 50,000 exploratory visits to companies fairly soon. Something like that would cost around 250 million guilders per year. Seen from a macroeconomic point of view, however, that investment would pay for itself in no time at all.' Practical experience has already borne out this proposition.

NOTA set up the PRISMA project just over two years ago, managing to persuade ten Dutch companies to participate in the study. Working with NOTA and two Dutch universities, they set out not only to demonstrate that waste prevention is possible, but also to discover whether it is reasonably affordable, what sort of preventive methods are the most effective, and what sort of government support would be most appropriate.

Encouraging Results

[De Hoo] 'The companies taking part have more than recouped their investment in PRISMA, thanks to reductions in emissions and solid waste. In choosing companies for the study, we went for a cross-section of firms representing the main sectors of Dutch industry.' On the whole, PRISMA's results are very encouraging, claims the project coordinator. The project's researchers came from the Erasmus Environmental Research Centre, based at Rotterdam's Erasmus University, and the University of Amsterdam's Interfaculty Environmental Studies Department. They worked in close cooperation with the Advisory Council for Research on Nature and the Environment (RMNO) and the Research Centre for Technology and Policy (STB), based at the Central Organization for Applied Scientific Research (TNO) in The Hague. Even set against the gloom of such environmental analyses as Zorgen voor Morgan ('Concern about Tomorrow') - which states that if long-term environmental problems are to be solved, the emission of waste products will have to be reduced by 70 to 90 percent - PRISMA demonstrates that many companies, provided they receive proper advice, have the capacity to get started almost immediately on using various methods of reducing their waste production. These include: using raw materials, additives and energy more efficiently; choosing alternatives; and investing in new processes and techniques. The PRISMA team estimates that at least one-third of preventive methods pay for themselves within one to three years and that another one-third come close to that figure. 'About 100 of the 160 methods studied by the ten companies taking part have turned out to be practicable within the space of three years,' says De Hoo.

All the same, such results sound more spectacular than they actually are. Without wishing to make any specific accusation, De Hoo makes the point that on the whole, Dutch companies have little idea how to go about prevention. More than ten years ago, the MP A. Lansink of the Christian Democratic Alliance tabled an Alliance motion on industrial waste policy. The order of priorities he set out for its treatment is still widely felt to be valid: first prevention; then re-use; if necessary, incineration; and as a last resort, dumping.

Stricter Standards

How different things are in practice! De Hoo points out: 'When it comes to real policies and spending real money, the order of priorities is precisely the other way round. Prevention gets the least money, and various types of dumping and processing get the most. Even the arrival of the National Environmental Policy Plan (NMP) and the NMP Plus has changed nothing. Granted, change is in the air. But most of the preventive measures now included in environmental plans are still at the research and consultation stage. All kinds of ideas are being bandied about.'

In this context, it is hardly surprising that by and large, Dutch companies have scarcely a clue as to whether they are capable of going down the preventive road - and if so, how. When standards and regulations for waste and emissions were tightened up, companies focused on the end of the production process. This used to come down to building higher smokestacks to dilute pollution. Later, gradually more advanced *end-of-pipe* facilities were installed. The intention was always to comply with new standards, preferably as cheaply as possible and with the fewest possible organizational changes. According to De Hoo, the impression has arisen in Dutch industry that environmental protection is hostile to business and invariably expensive. This is hardly surprising, given the common corporate response to tougher environmental standards, which is automatically to reach for more waste-processing technology such as afterburners and treatment plants. 'The systematic prevention of the production of pollutants as a priority has receded further and further into the background,' notes De Hoo.

This is precisely why NOTA took the initiative for the PRISMA project. Technological assessment is all about studying the socioeconomic, legal, ecological, and socioethical consequences of technology. In the vast majority of cases, it assesses technological innovations introduced to improve an existing process or service, for instance by making it more convenient, faster or cheaper.

Since such technologies often seem to lead lives of their own, it is important to track their social acceptability. In the legal world, for instance, computers were originally used to process streams of data. Now that this type of application is fully established, the question has arisen as to whether computer technology allows enough flexibility for the legal niceties to survive.

In this respect, PRISMA is a NOTA project with a difference. It is a demonstration project that has consciously limited itself to aspects of waste prevention within companies. De Hoo says: 'There are lots of companies out there pumping out pollution, while lots of technological solutions exist - some quite old ones and even more new developments - which could prevent it. Yet ecologically sound technology is hardly being used. This naturally prompts us to ask ourselves why, and to set out to discover if anything can be done about it.'

Customised Prevention

As well as taking extensive stock of obstacles to waste prevention in the ten companies where PRISMA was conducted, the project produced a list of more than 160 waste prevention methods. A customised prevention strategy was then drawn up for each company, based mainly on strategies found in a number of standard American manuals for the prevention of industrial waste and emissions. After ten months of putting these strategies into practice in the Netherlands, the PRISMA researchers compiled their observations in an instruction manual of their own, a commercial edition of which has also been published. About 700 editions are already in the hands of users.

The manual is used to track the flow of substances through the production process, constantly testing for possible ways of reducing waste products. Technical and commercial feasibility are two key selection criteria. Yet, despite the manual's clarity, setting up a preventive strategy is a major operation for a company. Depending on the focus of attention, it may take anywhere from a week to two months. During this time, every layer of the company's organization will have to be gone through in turn.

De Hoo concedes that this prospect may deter many companies. 'It is true that this is quite different from going to an engineering consultancy for an adjustment to the back end of the production process in order to keep emissions within legal limits. There is a whole series of barriers that, right up to the end, can stop a company taking preventive measures. You can surmount each one of them, but only if you go to work in an organised way and think things through. The attractive feature is that the effort often leads to an investment that pays for itself.'

However, middle-sized and small companies - which account for most of the Dutch business community - are especially disadvantaged when it comes to preventing waste without any outside assistance, say the PRISMA researchers. The final report contends that technological advice and organizational assistance are of decisive importance in getting a preventive strategy off the ground.

Tools

'It is not good enough for the Government simply to announce that companies should devise their own preventive strategies; it must also provide the tools for the job,' says De Hoo. 'It should send preventive teams to companies to check their waste prevention capabilities. It should make money available. There should be teams of experts to help draw up preventive strategies.' De Hoo can imagine such preventive teams being housed in the existing Innovation Centres; these are regional agencies that can advise bodies on modernising their approach. De Hoo points out: 'When a company constantly tries to update its response to environmental requirements as they change, it exposes itself to an incalculable factor

that can make havoc of strategic planning. Yet prevention can more than halve your waste production. If you take responsibility for it yourself, just as large industrial concerns have been doing for many years, you become independent of regulations. That is a more effective approach than constantly having to put out new fires whenever they break out. Of course, government regulation remains necessary. Only you have to do something on top. A government body that assists in waste prevention can smooth the way.'

In the meantime, the philosophy is catching on, among companies and their trade organizations, and among the public authorities. The interest of the business community in workshops on waste prevention is remarkably high, claims De Hoo. 'If they were to show no interest, we would be on the wrong track.' The National Environmental Centre (NMC), the environmental thinktank of employers in middle-sized and small companies, is already convinced of the usefulness and potential of prevention in major sectors of industry.

In addition, the provinces of North Holland, North Brabant and Gelderland are attempting to reorganise their regional industrial waste policies to take full account of the need for prevention.

Exports

PRISMA will probably even have international repercussions, following the translation into English of both its individual in-company reports and its final report. The United Nations Environment Program (UNEP) is interested in the methods developed by the PRISMA project. But the reports are primarily being used by the EC's EUREKA Program, in which context the Netherlands has proposed to 'export PRISMA', as De Hoo puts it. The aim is to generate collaboration among similar companies or on similar problem areas throughout the EC. As usual, Brussels has come up with an acronym for this collaborative effort: the sustainability-friendly term PREPARE (Preventative Environmental Protection Approaches in Europe).

NORWAY

Cesar Computer System, ERS-1 Satellite To Monitor Northern Oceans

91WS0454X Oslo AFTENPOSTEN in Norwegian 13 Jul 91 p 3

[Article by Olav Trygge Storvik: "Here Is How Norway Sees Everything on the Ocean in the North"]

[Text] Norwegian authorities can now watch the ocean expanses in the north and carefully follow the activities of the Soviet Union. This breakthrough results from the technological efforts of the Defense Research Institute [FFI]. This technology can also be used for civilian purposes.

The European radar satellite ERS-1 and the CESAR computer will make this possible. One goal of the new satellite is to keep a close watch on the environment and climate of large land and sea areas. Despite its name, CESAR is far removed from the Roman commander. It is simply and unobtrusive little box on the floor in the corner of a room at the Defense Research Institute. But, its modest appearance is highly deceptive. In reality, CESAR is a powerhouse with unique abilities. It is Europe's fastest computer, developed by researchers at FFI.

In eight minutes CESAR processes 64 megabytes of data, i.e. 20,000 standard-sized pages of text. In that time, it processes a picture of an ocean area covering 100 by 100 km and photograph interpreters can immediately begin their detailed studies.

It is the ERS-1, the European radar satellite, scheduled to be launched from French Guyana on 17 July, that will feed CESAR with data. The satellite will send a continuous stream of information to CESAR by way of the Tromso Satellite Station. This is possible because the satellite has a type of radar, a "synthetic aperture radar," as the experts explain, that allows it to see small objects even at great distances. The satellite will move in an orbit 800 km above Earth and it will be able to "see" just as well at night as during the day. It can penetrate fog and clouds. It will record everything on the surface of the sea. Now it will no longer be possible to conceal large-scale threatening operations involving warships off the coast of Norway. The government will be informed of everything that happens, so that it can take steps in time.

Clear Pictures

Director Erik Klippenberg of FFI and research chief H. K. Johansen, who is in charge of the Electronics Division, point proudly to the machine. "Look here," Klippenberg said. "Here is an example of what we can do. This is a picture of the Oslo Fjord and we can clearly see Hurum-landet, Drobak, Jeloya, Bastoy, and Drammensfjorden. On the east side of Jeloya we see three laid-up tankers. We see commercial vessels on their way in and out of the fjord and we can chart their position, course, speed, and classification, i.e., what type of ships they are. We can also see the waves and currents on the surface. We can also tell if a ship is polluting the environment by releasing oil and, in many cases, we can prove it," Klippenberg said.

Surveillance

Klippenberg believes that surveillance of large ocean areas in the north will be extremely important for dealing with future crises. "The best way to deal with a crisis is to have correct information about the other side and satellite surveillance makes this possible. In this way, we can base our decisions on a higher degree of certainty than would otherwise be possible," he said. But the new surveillance system will not only be important in crises. "We can watch fishing vessels in our economic zone and

more effectively send coast guard ships where they are needed. This will save money by making their operation more efficient than it is today. In addition, under most conditions we can also detect ships that release oil and foul the environment. We can also detect wave and current conditions on the ocean surface."

Research chief H. K. Johansen said that FFI had won a development contract from the European Space Agency, ESA, for future observation satellites. Work on the CESAR project started as long ago as 1978 and it is just one more example of how FFI researchers are on the cutting edge of developments. It is possible that we are looking at a new branch of industry that will have great economic importance to Norway. There are plans to manufacture the CESAR computer in Norway and it will be much less expensive than foreign alternatives, according to the FFI researchers.

UNITED KINGDOM

Trade Unions Support Antinuclear Power Policy

92WN0014A London THE DAILY TELEGRAPH in English 6 Sep 91 p 9

[Article by Anthony Looch: "Scargill Wins Day on Nuclear Power"]

[Text] Mr. Arthur Scargill bounced back yesterday to win support for an antinuclear energy policy.

The National Union of Mineworkers' president, whose call to scrap all Tory employment law was heavily defeated earlier this week, held off attempts to dilute TUC [Trade Union Congress] opposition to nuclear power.

Calling on Congress to "vote for sanity" on nuclear power, Mr. Scargill said "the arguments of those who are fundamentally opposed to it have been vindicated absolutely."

Referring to the Engineers' and Managers' Association's [EMA] call for a multisource power policy, including nuclear power, he said: "It would be a crime for this Congress to say to the British people that we recommend suddenly departing from our past commitment to the phasing out of nuclear power."

He accused the EMA, to which many nuclear workers belong, of attempting to "turn back the clock" and said a large majority of the British people believed that an expanding nuclear power programme presented "an appalling risk" to life and the environment.

He said it was surprising that the concept of market forces, which aimed to get the cheapest price, was not applied to nuclear power, which cost three times as much to produce as any other form of energy.

Mr. Scargill said that the Hinkley Point inquiry had backed his assertion that a Chernobyl-type disaster could occur in Britain. "In the light of that statement, no sane man or woman can continue to support a nuclear power programme.

"We need a balanced energy programme which means the phasing out of all nuclear power," he said, and stressed his support for alternative sources of energy such as wind and wave power.

Mr. Tony Cooper, general secretary of the EMA, said: "We are likely to see a 100 percent increase in carbon dioxide in the next 20 years, and a rapid, unpredictable and unprecedented change in the world's climate.

"There is no single form of energy that does not pollute. The key is to mix the different forms of energy production and not to concentrate on any particular one."

New Environmentally Sensitive Areas Announced

92WN0178A London THE DAILY TELEGRAPH in English 21 Nov 91 p 6

[Article by David Brown, Agriculture Correspondent: "Farmers To Get More for Saving Landscape"]

[Text] Farmers are to be paid more to protect and improve the countryside, Mr. Gummer, the Agriculture Minister, said yesterday.

He was announcing 12 new environmentally sensitive areas [ESAs] in England and two in Northern Ireland

"What we are saying is that we recognise the farmer is the key figure in the conservation of Britain.

"The areas have proved a tremendous success since they were introduced in 1987. They help farmers to conserve special habitats, landscapes and features of historic interest.

"Their contribution to protecting areas of environmental importance has been acclaimed by farmers and environmentalists alike and have paved the way to similar schemes throughout Europe and farther afield.

"Here we are paying farmers not to increase production, but to do something worthwhile. This is a lesson that the EC must take on board."

About 3,100 farmers in England receive payments of between £4 and £120 an acre depending on the scale of the measures they volunteer to undertake to protect and enhance the environment.

The new payments, which will be determined according to individual cases, will be higher but in return farmers will have to work harder.

State spending on the areas is to rise five-fold from £13 million a year to £64.5 million in 1994-95 and will increase the land under the scheme in England from 850,000 acres to nearly three million—12 percent of the total.

The proposed new areas, chosen by the ministry after talks with farming and environmental bodies are; Exmoor, Hampshire Avon, Lake District, North Dorset and South Wiltshire Downs, North West Kent Coast, Cotswold Hills, South Western Peak, Blackdown Hills on the Devon-Somerset border, Dartmoor, Essex Coast, Shropshire Hills and the Upper Thames Tributaries.

The first six will start next year and the remainder in 1993.

In addition improvements and extensions will be made to the 10 existing areas: the Pennine Dales, North Peak, Shropshire Borders Breckland, Broads Suffolk River Valleys, Somerset Levels and Moors, Test Valley, South Downs and West Penwith.

In Northern Ireland, the counties of Antrim—including Rathlin Island—and Fermanagh are to be designated as ESAs.

Two new areas in Wales will be selected from a short-list of four: Anglesey, the Clwydian Range, Radnor and Preseli. Five more are also proposed for Scotland.

Outlining the 12 English sites, Mr. Gummer said that the Lake District, South Western Peak, Shropshire Hills, Exmoor and Dartmoor were all important habitats and landscape features which depended on traditional farming practices but where moors and meadowland were in decline. The Cotswold Hills, North Dorset, South Wiltshire Downs and Blackdown Hills were outstanding examples of three distinctive types of English countryside: limestone hills, chalk grassland and the traditional lowland landscape of small fields high hedges and broadleaved woods.

The Essex Coast and North West coasts were internationally important for wildfowl which depended on the management of grasslands and grazing marshes.

The Upper Thames Tributaries and Hampshire Avon valley were important for their wet grasslands and herb rich hay meadows.

The announcement was welcomed by the Royal Society for the Protection of Birds, which said it would help a wide range of birds.

Miss Barbara Young, chief executive, said: "This is excellent news for nature conservation. Environmentally sensitive farming is vital to the future of our most threatened wildlife.

"The Government now faces the difficult task of persuading our partners in the EC that green farming schemes such as ESA's must be at the very heart of the Common Agricultural Policy reform. Current proposals pay scant attention to the environment."

Mr. David Naish, president of the National Farmers' Union, welcomed the move. He said: "This demonstrates the principle of voluntary incentives for farmers to look after the countryside positively."