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G-15 Environmental Workshop Charts Conservation Strategy

92WP0043A Madras THE HINDU in English 27 Sep 91 p 8

[Text] New Delhi, Sept. 26—India will continue as the G-15's coordinator for ensuring interregional cooperation to prevent 'rapid extinction of valuable plant species'. It will also play a leading role in identifying 'nodal points' and in appointing a scientific advisory committee.

India's key participation in the environmental protection effort, especially in large areas of the Third World, was sought by the G-15 at the conclusion of its meeting of experts here recently.

The workshop which began on September 23 was held following the decision of the G-15 at their summit meeting held in Kuala Lampur in July last. The meeting was inaugurated by the Prime Minister's Adviser on Science and Technology, Dr. Gawariker.

The G-15 countries among others include India, Brazil, Argentina, Egypt, Malaysia, Mexico, Yugoslavia and Zimbabwe.

Five-point plan: Highlighting the urgency of checking 'environmental erosion', the group charted a five-point conservation strategy. It includes establishing a trust fund to finance projects which the group may undertake. Its activities will be coordinated regionally by Brazil in the case of Latin America and Egypt in the case of Africa. India will remain its coordinator in Asia.

The detailed plans will be referred to the second summit of the G-15 to be held in Caracas in November this year.

The purview of environmental protection will be expanded to include aromatic plants. Moreover, the scope of solar energy use is sought to be broadened to include vaccine preservation, drinking water and lighting. Special efforts will be made to extend refrigeration systems to remote areas.

World Endangered Species Trade Competes With Arms, Drugs

OW2510115091 Tokyo KYODO in English 1057 GMT 25 Oct 91

[Text] Tokyo, Oct. 25 KYODO—World trade in endangered species is beginning to rival the trade in arms and drugs, Izgrev Topkov, secretary general of the office of the Convention on International Trade in Endangered Species (cites) said Friday.

Topkov, a Bulgarian national, said arms and drugs smugglers are finding it more difficult to carry out their illicit activities and are making inroads into the endangered species trade.

Topkov, who is in Japan to prepare for the eighth conference of the 112 member states and parties to the convention, to be held in Kyoto from March 2 to 13, said CITES has matured into one of the world's major conventions.

"The Kyoto conference will have a big task to strike a balance between sustainability and conservation," Topkov said.

"It will be helping to save the biodiversity of the world without making it a botanical and zoological museum.

"CITES is important because the international trade in endangered species is the second-biggest danger to species after the destruction of their habitat."

Topkov said the world is losing 50 species of flora and fauna every day because of pollution, loss of habitat, and illegal trade.

"Saving the species is in the interests of trade also," Topkov said. "There is no trade if there is no species."

Topkov said delegates to the CITES conference have already tentatively proposed the protection of 100 additional species, including herring [as received], bluefin tuna, and reptile skins.

Officials at the Foreign Ministry said earlier this month that a major concern to Japan is a possible Swedish proposal for the addition of bluefish tuna to the list of protected species covered by CITES.

But Topkov declined to say whether the proposal would reach the conference.

"Bluefin will just be a normal question provided a country proposes it and does not withdraw the proposal," Topkov said.

"I am specifically refraining from mentioning countries."

Topkov said the Kyoto conference will differ from previous CITES conferences by concentrating on "returning and revitalizing the true balance of different species" rather than on specific species.

He said the conference will also hear a major report from the CITES secretariat on alleged infractions of CITES regulations.

Vladivostok Participants Agree on Northeast Asia Environmental Cooperation

SK0411050091 Seoul YONHAP in English 0433 GMT 4 Nov 91

[Text] Seoul, Nov. 4 (OANA-YONHAP)—South Korea, Japan, China, and the Soviet Union have agreed to form a regional environmental cooperation committee to deal with marine life preservation, restriction of waste disposal and accident prevention, the Foreign Ministry said Monday.

The agreement was reached at the first working-level meeting, sponsored in Vladivostok October 28-31 by the United Nations Environment Program, it said.

The first regional environmental consultative group in Northeast Asia, it will focus specifically on the Yellow Sea and the Sea of Japan.

Ministry officials said South Korea hopes to talk closely with North Korea and China through the committee.

North Korea was to have attended the meeting, but was absent without explanation.

The four participating countries are to submit a national report by March next year, compiled from their respective internal reports. They did not yet decide on where and when to open the committee secretariat or on details of the joint research projects, officials said.

A second working-level meeting is planned for either Beijing or Tokyo in October next year.

REGIONAL AFFAIRS

Namibia, Angola To Cooperate on Joint Hydroelectric Project

MB2510145691 Johannesburg SAPA in English 1342 GMT 25 Oct 91

[Text] Windhoek Oct 25 (SAPA)—Namibia and Angola have signed a cooperation agreement on the future development of the proposed hydroelectric scheme Namibia is to build at Epupa on the Kunene River bordering the two countries.

It was signed at Lubango in southern Angola on Thursday during a meeting between Namibian President Sam Nujoma and the Angolan head of state Mr. Jose Eduardo dos Santos.

Mr. Nujoma said on his return a feasibility study still had to be done. A joint committee would be set up with members from Angola and Namibia to conduct negotiations and the feasibility study.

After approval of the exact dam site in the Epupa region about 130 km west of the existing Ruacana hydroelectric scheme, the project would then go ahead, Mr. Nujoma said.

The proposed dam for the hydroelectric scheme has a capacity of 5000 million cubic metres providing water to generate between 450 and 500 megawatts of electricity. It also holds vast potential for irrigation in the region.

The projected cost of the Epupa project, expected to begin in 1993 and take seven years to complete, is R[rand]2.5 billion.

At Thursday's meeting Mr. Nujoma said joint use of water from the Kavango River, which also borders Botswana, was also discussed.

BOTSWANA

Minister Accuses Botswana of Misusing Land Resources

MB2510142491 Gaborone Radio Botswana Network in English 1910 GMT 24 Oct 91

[Text] The vice president and minister of local government, lands and housing, Mr. Peter Mmusi, has accused Botswana of misusing the country's scarce land resources.

Mr. Mmusi made the accusation when opening a three-day seminar on the new agricultural policy in Francistown today. He told the more than 100 participants in the seminar that it's disturbing to see land suitable for agriculture being lost to competing land users. He gave the example of the arable land which has being converted into a settlement.

The participants were further told of the need for a well planned land use. The process of converting land from agriculture to residential use was proving that the reverse process is [word indistinct], warned Mr. Mmusi.

The vice president said the reliable [word indistinct] of the important [word indistinct] soils are the main reasons for shortage of agricultural land. He said the problem created by the physical environment was already too great, and said it could be made worse by mismanaging the scarce resources available to the country.

Mr. Mmusi also talked against the cutting of trees at wrong times and wrong places, and the continuing expansion of agriculture. He said this posed a threat to both the physical environment, environment and forestry related enterprises. He said it was only through proper coordination and cooperation that programs on land management could be successfully implemented.

Mr. Mmusi further warned that land lost through application for wrong purposes or overgrazing cannot be restored. He recognized that there are conflicts, particularly between wildlife and livestock in some areas, but he said this conflict can be addressed through proper land use and planning.

He further briefed participants on the use of projects planned by the Ministry of Agriculture and the NDP-7, which includes land monitoring and planning. The project, he said, will be imlemented with the assistance of the UN Development Program and the Food and Agricultural Organization. Through the project, a methodology to evaluate land for various competing uses will be developed, he said.

Deletgates further heard that one of the products intended is a land suited [word indistinct] map due for publication early next year. He said once implemented the project will not only generate information indicating levels of performance, but will also indicate [word indistinct] associated with [word indistinct] land use. Other projects are the soil conservation, which allows the Ministry of Agriculture to assist farmers adopt appropriate management techniques and that of forestry, which will place emphasis in rehabilitation of forests and land resources in areas where forests have been depleted.

MOZAMBIQUE

Government Initiates Forest Conservation Projects

92WN0067A Maputo TEMPO in Portuguese 20 Sep 91 pp 14-20

[Article by Inacio Laissone]

[Text] The destruction of native forests for firewood is causing a catastrophe, at least around the major urban centers. The government is also aware of this, for which reason it has initiated reforestation projects, to increase the sources of supply and improve the quality of energy.

When living trees are cut for firewood, nothing is left but unprotected, and thus uncultivated, earth. It is an open door for desertification. The massive and uncontrolled deforestation is well illustrated in the environs of the large Mozambican population centers.

The growing influx of people around the city of Maputo, a result of various factors including the growing lack of security in the country's rural zones, and the difficulty of supplying fuel for lighting, is creating a phenomenon in the country's capital: the consumption of large quantities of firewood and charcoal, particularly by families with scarce financial resources.

Trucks laden with firewood and sacks of charcoal flow into the city of Maputo daily from the regions of Changalane, Marracuene, Goba and other zones of Maputo Province. Supplying wood fuel to this city is carried out, for the most part, by private producers and street vendors.

In the capital city's markets and on some corners, women conduct the business of wood fuel. The local situation is one of great competition among vendors and little affluence among buyers. In the neighborhood of Maxaquene, Amelia Maibasso is an old woman who struggles for her living selling bundles of wood and little cans of charcoal. She says that she buys firewood brought from Changalane and Marracuene by truck. "It is not a very profitable business. I buy a large chunk of firewood for 90,000 meticais and then pay the cutters," she pointed out. Amelia Maibasso then sells her products at prices ranging from 250 to 300 meticais per bundle of wood or can of charcoal.

Worsening of the Family Budget

Two years before, the number of families around Maputo who used wood fuel was around 200,000, consuming some 360,000 tons per year, according to figures provided by the Ministry of Industry and Energy. Today, the reality is different, and it is thought that the number has increased, given the growing influx of people to the country's capital.

In the neighborhood of Mafalala, Julieta Romao is a domestic who uses in her kitchen firewood purchased from street vendors near her house. She says that the price of firewood is high, since "a stack of three bundles of wood costs 300 meticais." To cook food for one day, Julieta Romao spends close to 1,500 meticais. "It is difficult to live that way with the cost of living. I cook only with firewood because I do not have a coal, gas, or electric oven.

The situation Julieta Romao faces is not restricted to her family, since others are experiencing the same conditions. The increased proportion of spending on this energy source—firewood and charcoal—out of the family budgets is caused by high transport costs.

It is known, for example, that close to 70 percent of the price of wood fuels corresponds to transport costs, given that the exhaustion of the forests around the city of Maputo leads wood and charcoal sellers to journey out to the inner jungles despite the areas' insecurity. It is that very risk that leads merchants to increase the prices of the wood fuels even further.

However it may be, even though it is known that cooking with wood and charcoal is the most expensive method, something has to be done to lower the cost of living for families without means of utilizing other energy sources. It is necessary to combat speculation in the selling of wood fuels because many opportunists justify emptying the citizens' wallets by the argument that it is difficult to go to jungles infected by war and bring firewood and charcoal back to the city.

Officials affiliated with the National Forests and Wildlife Directorate are also concerned about consumers of biomass (firewood, charcoal, and agricultural residuals), and support making free wood fuels available to the population. "Firewood or wood fuels should be obtained by the consumers for free," they say. They also support creating a subsidy for wood fuels.

The destruction of the native forests for the sake of wood fuels is a concern of the Mozambican Government, despite the fact that it is claimed that the lack of wood and charcoal in the major population centers "is essentially a short-term problem, since the country possesses various alternatives for new sources of energy and a considerable reserve of biomass," according to the National Forest and Wildlife Directorate's document.

In an attempt to resolve the problem of scarce wood fuels in the country's primary urban centers, the Mozambican government is carrying out projects ranging from reforestation and increasing supplies, to improving the quality of energy sources.

Mineral Coal Project: A Fiasco?

In the city of Maputo, in 1988, the consumption of mineral coal was introduced as a substitute for firewood and charcoal. The program was developed during the course of observing an increase in the proportion of energy expenses in family budgets, as well as massive deforestation of the vast zones around the country's capital.

Until then, it had been a pilot program, and State funding was guaranteed for mineral coal imports for a period of close to five years, in addition to the fact that experiments with coal ovens were taking place. From the beginning, the mineral coal program constituted an element of a more global strategy that the Ministry of Industry and Energy was preparing to improve energy supplies to consumers.

A little more than two years later, what is the current status of the mineral coal program? At the Ministry of Industry and Energy, the entity responsible for the program's implementation, no one knows anything. Engineer Jose Lopes, who works (worked) in the mineral coal program, made himself unavailable to exchange

thoughts on the program's status because, he said, "I am no longer associated with the mineral coal program."

Also at the Ministry of Industry and Energy, we learned that the person leading the mineral coal project is Engineer Manuel Ruas. However, our efforts to contact him failed. We wanted to raise the issue with the Minister, but this was not possible because at the time, he was participating in the activities of the VI Frelimo (Mozambique Liberation Front) Congress. Other officials at the Ministry of Industry and Energy showed complete ignorance of the project, stating that "this ministry has nothing to do with mineral coal," and pushing us to the Ministry of Mineral Resources.

But because the mineral coal project does exist, we went to Mafalala neighborhood, where many ovens have been assembled and where "Carval C. Lda.," an establishment owned by Joao Alves that sells mineral coal, is located. The residents we contacted share the same point of view with respect to the quality of the mineral coal being sold: "The coal is too fine, it doesn't work for our ovens. We prefer raw coal, which is better for our consumption."

Angelina Salvador is a girl from Mafalala who traded her school bench for domestic life. She said that for her cooking, she uses mineral coal because it is best. "Mineral coal is the best option when we do not have electricity," Angelina Salvador pointed out. Many families that have mineral coal stoves feel good when they use this mineral in their kitchens, and when it is scarce they prefer firewood, even though the latter is more expensive.

The mineral coal project, conceived as an alternative to the growing consumption of wood fuels, is not attaining the objectives for which it was developed. As proof, people associated with the institution responsible for it are unaware of its existence.

FO Results Remain To Be Seen

Because of restrictions imposed by the war, and given the need to ensure the supply of wood fuels to the large population centers, the Mozambican government has begun to provide incentives for reforestation programs around the principal cities. The FO [expansion not given] projects around the cities of Maputo, Beira, and Nampula, to provide forest plantings to obtain wood fuels, are today a reality.

The plan that has been developed anticipates satisfying 60 to 70 percent of wood and charcoal needs. However, the fruits of these projects still remain to be seen because they face problems of a technical nature. Engineer Osvaldo Mango of the National Forest and Wildlife Directorate said that the FO projects lack material support—security equipment, tractors, vehicles, communication radios, and other items. The needs of the FO projects are currently being filled because, according to Engineer Osvaldo Mango, the World Bank has already made financing available.

In Marracuene, near the city of Maputo, the FO-2 project is located, which was conceived for supplying wood fuels to the population of Maputo. In addition to the general difficulties, this project faces the problem of theft. People have cut down living trees for various purposes.

Consultants from the Biomass Energy Program of the National Forest and Wildlife Directorate say that charcoal production in the FO-2 project is inefficient and has no commercial interest, explaining, "the charcoal sellers in the project show limited technical knowledge and have consequently achieved low productivity using the matope stove system." And they have initiated training courses for the workers to introduce appropriate charcoal production techniques.

The Biomass Energy Program is a global project in the area of wood fuels financed by the World Bank. Engineers Osvaldo Mango and Anthony Williams, who are leading the program, say that studies and research in the area of biomass energy are underway, and will permit the development of a wide-ranging policy in the areas of reforestation, increasing supply sources, and improving the quality of energy. It is the responsibility of the Ministry of Industry and Energy.

Based on data from previous years, the consultants are following the path of the firewood from the area of harvest to the consumer, and analyzing the real costs of this operation. Another component of the program is evaluating traditional charcoal production methods, according to Engineer Anthony Williams, who adds that the work is to be done in coordination with students from Eduardo Mondlane University.

The drafting of terms of reference for the exploitation of fuelwood resources throughout the country is the beginning of a series of integrated projects in the Biomass Energy Program, financed by the World Bank for a period of five years. In the specific case of the reforestation projects, Engineer Anthony Williams supports decentralization to permit participation of the private sector in the FO projects around the country's primary population centers.

Whatever happens, it is necessary to act rapidly to prevent massive destruction of the native forests around the country's primary urban centers, otherwise any other project will be too late.

NAMIBIA

Shortage of Water Hampering Country's Development

MB2510212091 Johannesburg SAPA in English 2105 GMT 25 Oct 91

[By Carmen Honey]

[Text] Windhoek Oct 25 (SAPA)—The availabilty of water is one of the key facets hampering Namibia's development, President Sam Nujoma said on Friday.

"While our country is endowed with a wealth of various natural resources, their development and exploitation is hampered by a lack of one vital resource that is water," Mr. Nujoma said at the official opening of the R[rand]41 million Oanob Dam in the Rehoboth District south of Windhoek.

Commending the "exclusively Namibian" nature of the project designed, planned and built by the Department of Water Affairs and with significant involvement from the private sector, Mr. Nujoma said: "This is the sort of partnership between state and private sector venture which the government wishes to encourage".

He called the dam with a 30 million cubic meter storage capacity and 55 metre high wall an example of Namibian expertise illustrating the capability and potential available in the country.

"If we as a nation can harness our energies, pool our resources, combine our efforts; and together make use of the many, sometimes unexploited, talents that we have, we can achieve our goal of making this country and people a prosperous nation.

"This project is, in its own way, an example of reconciliation and nation building," Mr. Nujoma said of the first dam to be built in the country since 1986 and the first in an independent Namibia.

He said Rehoboth has been one of the fastest growing towns in the country, but this forward development had been threatened by the absence of an adeqaute water supply.

"I am sure that it (the Oanob Dam) will serve as a bright example to all Namibians to see what can be achieved by hard work, faith in ourselves and our abilities to deliver the goods to our people on time," Mr. Nujoma said.

"The doors to development of this area are now open, opportunities have been created for industrial and commercial ventures to be established in Rehoboth."

In his short address, the minister of agriculture, water and rural development, Mr. Gert Hanekom, said it was hoped that the same technology used at Oanob, for the first time in Namibia, would also be used in the proposed hydroelectric scheme at Epupa on the Kunene River bordering Angola.

The dam is the first structure in which pulverised fuel ash was used extensively as a partial substitute for cement.

Noting that great attention was given to preserving the ecology of the site both during construction after, Mr. Hanekom appealed to diplomats present to forward a request to their governments for assistance.

"We want to give the assurance that what you give would not be wasted," Mr. Hanekom said.

"We waited a long time for our independence, we do not intend destroying our heritage."

The dam, which is about one third full at the moment, has enough water to supply Rehoboth for two years, according to a water affairs official, Mr. Adrian Cashman.

SOUTH AFRICA

Police Unit for Endangered Species Achieves Increasing Success

92WN0043A Johannesburg BEELD in Afrikaans 10 Sep 91 p 9

[Article by Andriette Stofberg: "'Hillbrow Smuggling Route'; South Africa Is Transit Route for Trade in Ivory and Rhinoceros Horns to the East"]

[Text] **South Africa is regarded as the focal point for illegal trade in ivory and rhinoceros horns, because smugglers use this country as a transit route to the East.**

However, things these days are clearly no longer as rosy for the smugglers as they used to be. This is due to the increasing success achieved by the Police's Protection Unit for Endangered Species.

Still, this unit has certain major problems, says senior reporter Andriette Stofberg.

In African countries where elephants and rhinoceroses have thus far been mowed down on a large scale, the news has been spreading lately that South Africa has become "hot" for smugglers.

Indeed, in a recent case before the Johannesburg Magistrates' Court, it was testified that the price of rhinoceros horns in the smuggling trade has dropped because buyers were frightened after the Police apprehended numerous people for illegal trade.

Two Taiwanese who attempted to buy approximately 205 kg of rhinoceros horns for nearly a quarter of a million rands from members of the Protection Unit for Endangered Species during a sting operation were each sentenced to nine months imprisonment, without the option of paying a fine.

This was the first time that members of the unit acted as sellers in a sting operation. The case is thus regarded as a milestone, says Major Pieter Lategan, the unit's commander.

The message to people who are engaged in illegal trade in rhinoceros horns and ivory is: Now you no longer know whether the man selling to you might be a policeman. In the past, they only had to consider that a buyer might be a policeman.

Another recent milestone for the unit was the case a couple of weeks ago in which two citizens of Zaire who were caught with 57 kg of ivory in a Johannesburg hotel

were each sentenced to a fine of 60,000 rands or six years imprisonment, plus an additional fine of 100,000 rands.

This case was the first one in Transvaal where anyone has been punished for illegal trade in ivory or rhinoceros horns under new, more rigorous legislation.

The amended Ordinance on Nature Conservation stipulates that elephants and rhinoceroses in Transvaal are specially protected wildlife. The penal provisions for illegal trade in elephants and rhinoceroses or in parts of those animals now provide for a fine of up to 100,000 rands and/or 10 years' imprisonment.

This change is in accordance with the penal provisions in the other three provinces, so that uniform legislation in this regard now applies nationwide. This is something that has long been advocated by conservation organizations and the Police.

The two Zairians were members of a smuggling syndicate ensnared by the Protection Unit for Endangered Species. Other members will appear in court later. Besides the 57 kg found in the hotel, another 2,667 blocks of ivory were later confiscated from a Chinese man in a store at Carlton Centre.

(If one considers that smugglers can get only about 10 blocks of ivory from an elephant tusk, weighing on the average 10 kg once it is sawed up—about half of the tusk is lost—this means that around 130 elephants were mowed down in order to get those 2,667 blocks.)

However, bringing smugglers of ivory and rhinoceros horns to justice is not the sole focus of the unit. They are responsible for combatting the illegal removal of and trade in all endangered species of fauna and flora, including breadfruit trees and exotic birds.

Loopholes in legislation in the area of nature conservation, so that smugglers can get off easy or even scot-free after great effort has been expended to catch them, as well as the lack of uniformity in legislation among the various provinces, are a source of major headaches for the unit.

For example, an animal that is endangered in one province is not necessarily endangered in another province. There, it could simply be "protected" or "specially protected wildlife" or a "specified wild animal." The applicable penal provisions differ considerably and make interprovincial law enforcement even more difficult, according to Major Lategan.

Some species of the breadfruit tree in Transvaal are specially protected plants, for which illegal possession is punishable by a fine of up to 1,000 rands and/or imprisonment of one year. In contrast, all breadfruit trees in the Orange Free State are protected plants, and the punishment there is a fine of up to 600 rands and/or imprisonment of one year.

Because of the lack of coordination and the problems with loopholes in the legislation, the unit submitted a proposal to the Presidential Council a couple of months ago. In it, the Police advocates uniform, nationwide legislation in order to protect endangered species of plants and animals.

The uniform penal provisions that now apply with respect to illegal trade in elephants and rhinoceroses in all four provinces are welcomed by the Police.

In Transvaal, the legislation contains an extra sting. Besides the fine of up to 100,000 rands and/or imprisonment of up to 10 years that can be imposed on a smuggler—as is the case nationwide—a smuggler in Transvaal can also be forced to pay a fine amounting to three times the value of the animal.

If one considers that an elephant's value is set at around 25,000 rands, then fines amounting to a hefty sum of money can thus be imposed on a smuggler.

Smugglers use South Africa primarily as a transit route for smuggling ivory and rhinoceros horns to the East. Thus, the elephants and rhinoceroses are not killed in South Africa itself, but rather in countries such as Zaire.

The greatest single problem that the unit has is that it is not possible to search all cargo, especially container loads, coming into the country.

The solution is international cooperation. The unit already has good cooperative ties with the police in Malawi and the Species Protection Unit in Zambia.

Maj. Lategan believes that the stage of joint action against and prosecution of smugglers in neighboring states is at hand. Thus, it could be possible in the future that the unit will go into a neighboring state to catch smugglers using South Africa as a transit route even before they are able to smuggle a load of ivory or rhinoceros horns into South Africa.

The unit's success is reflected by the fact that in only eight days at the end of August, they rounded up 14 people in six different incidents for illegal trade in ivory and rhinoceros horns, and confiscated nearly 3,800 blocks of ivory, seven elephant tusks, and four rhinoceros horns.

Contrary to what many people may think, the unit does little work in the field. Eighty percent of their work is in Johannesburg, especially Hillbrow, where all smuggling roads lead, as it were.

Minister Warns Industries on Environmental Action

92WN0054A Johannesburg THE STAR in English 17 Sep 91 p 12

[Text] In a no-nonsense speech on the Government's forthcoming environmental policy, Environment Minister Louis Pienaar has warned of tough action if companies did not voluntarily adopt "green" policies.

He also warned that the European Community's new environmental standards, which come into effect next year, could have repercussions in South Africa.

Speaking at Mintek in Randburg—at the AECI's first annual environmental conference—the Minister said unless South African industries accepted firmer environmental controls, their overseas clients could begin shopping elsewhere.

He predicted a trend overseas towards "fiercer competition in areas such as quality and environmental acceptability."

He said "when the new EC standards take effect in 1992, in terms of the tightening of EC trade barriers, EC countries are likely to apply strict environmental control and auditing standards on products and services being imported.

"A wise company will prepare and be ready—the unwise one may find itself out in the cold."

He said the burden imposed on the world living systems by industry was "disproportionately heavy if we consider the rest of the world's needs."

"Within the period of one generation we must solve our environmental problems and we must put an end to the process whereby we transfer our problems elsewhere—or shift the burden to the shoulders of later generations."

He gave the example of West Germany, which had used its poor neighbour, East Germany, as a waste dumping ground. "The chickens have now come to roost and the new United Germany is faced with rubbish heaps of mountainous proportions.

"The South African Government takes the view that the success of the implementation of environmental policy would be greater if consensus could exist between Government and industry on the manner by which targets and objectives should be reached.

"However, if the targets set are not achieved, the Government will not hesitate to introduce the necessary legislation."

The Minister warned of "policies we intend to pursue":

—Promoting substantially changed attitudes to existing waste producing patterns of production and consumption.

—Even without 100 percent scientific evidence, no longer waiting before taking action to protect the environment.

He praised AECI's comprehensive environmental policy statement, which is adhered to by the company's 36 operating sites across South Africa.

AECI now undergoes annual environmental audits—done by internal and external auditors—to assess its annual progress.

The Minister's warning reinforces a recent CSIR [Council for Scientific and Industrial Research] statement that said overseas companies were under pressure from greens movements, especially in Europe, to provide information showing that their overseas suppliers were behaving in an environmentally compatible way. It began with the wood industry, which was suspected of buying hardwoods from Third World countries that were destroying rainforest to make quick cash.

Dr. Dirk Grobler of the CSIR's environmental unit told THE STAR that more and more South African companies were approaching it after receiving letters from their overseas associates asking for proof that their South African operations were environmentally nonpolluting and environmentally sustainable.

Two New Game Parks To Boost Local Economy

92WN0076A Johannesburg FINANCIAL MAIL in English 20 Sep 91 p 92

[Article by Brendan Ryan: "Big Bucks for Conservation"]

[Text] SA [South Africa] is finally waking up to the economic potential of its wildlife. Two new major game reserves in the works—Madikwe in Bophuthatswana and Phinda in Natal—will give this trend a big boost. The benefits are not only the conservation of the environment and the wildlife, but also the increased jobs and earnings for the communities around the reserves, as well as the shot in the arm the entire economy gets from the rise in tourism.

"Up till now SA business has concentrated on the global competitive advantage it has in nonrenewable resources such as the country's mineral wealth," says Wits economist Frank Vorhies. "Attention is at last being paid to the renewable resources such as wildlife in which we also have a global competitive advantage."

The target market is the international tourist with an interest in the environment—the eco-tourist—and Satour vice-chairman Noel de Villiers reckons that the country can attract the cream of this business.

Just more than 1m visitors came to SA last year, bringing in R2,5bn of foreign exchange. But De Villiers points out that these figures are far below what SA should be receiving, because of apartheid, and that it is not unreasonable to expect a 1m annual increase in visitors in about four years. That would bring in another R2,5bn annually and create up to 300,000 jobs.

In the case of the Madikwe Game Reserve, the Bop government has broken new ground by acting on the results of a study showing that the economic returns from using Madikwe's marginal land as a game reserve far outweigh the profits to be made from cattle ranching.

The second project, the Conservation Corp's Phinda Resource Reserve, reflects the increasing tourist and

investor interest in SA, now that the country's polecat image has faded. About 70 percent of the R80m in capital needed for Phinda will be raised abroad with the help of London merchant bank Hambros.

Both projects stress the need to make game reserves relevant to the neighbouring rural communities by emphasising employment opportunities and involving local businesses to supply the luxury lodges.

Both also intend to become top destinations for eco-tourists. Phinda is in the middle of what should become the Greater St. Lucia Reserve and, eventually, the Greater Maputaland Reserve. Madikwe will offer tourists the chance to spot the big Five within just a three-hour drive from Johannesburg. Both reserves will extensively restock and reintroduce game species.

Madikwe covers about 75,000 ha north of Zeerust and is bounded by the Botswana border in the north and Dwarsberg in the south. If the Dwarsberg sounds familiar it's because this is Oom Schalk Lourens' turf, made famous through the short stories of Herman Charles Bosman.

The land was recently incorporated into Bop from SA after being occupied by large-scale commercial farmers, which provides a key political advantage—no tribes people have been displaced by Madikwe.

A land-use study by consulting ecologists and economists showed wildlife-based tourism to be the best option for the land. The study said cattle farming would generate only 80 jobs compared with the 1,200 that six luxury safari lodges along the lines of Londolozi and Mala Mala would provide.

Per capita income for labourers involved in cattle ranching would average about R3,000 annually compared with R7,200 from tourism.

Each of the lodges should produce income of more than R4m a year. Hunting will eventually bring in another R30m. Bop National Parks takes the opposite view to the National Parks Board, which runs Kruger.

The National Parks Board refuses to allow any private game hunting on its reserves, though game must be culled regularly to control overpopulation.

On the other hand, Bop Parks now has a scheme in which foreign hunters pay $7,000 just to dart rhinos that have to be captured alive for relocation to other reserves.

The Bog government expects to earn R4,8m a year from Madikwe compared with a paltry R80,000 from cattle ranching, which also carried the risk that government would have to subsidise it in this drought-prone region.

Phinda is being set up by the Conservation Corp., which has brought 14,000 ha at a cost of R29m, with the bulk put up by the Masterbond trust group. Chairman Dave Varty, co-owner of the Londolozi game reserve, and MD Alan Bernstein, MD of J.H. Isaacs International, have kicked in about R4m between them. Varty intends applying the Londolozi conservation approach to running Phinda.

"I know how to make money out of wildlife on a sustainable basis," Varty says.

He says that since Londolozi started in 1976, the value of its land has jumped from R250/ha to R6,800/ha, while tariffs have rocketed from R3 a night to more than R1,000 a night in the peak season.

It's those sorts of numbers that have attracted overseas investors now that SA is returning to respectability. Hambros Bank plans to set up both an SA and an offshore company to fund Phinda. The minimum investment per subscriber will be R450,000.

Varty says the Phinda Lodge will provide jobs for 230 local people by the end of the year, generating R1.38m in salaries, while plans are to set up joint business ventures with locals on such enterprises as transport, butcheries, brickmaking, charcoal manufacture and the supply of vegetables, poultry and fish.

In addition, the local community will benefit from the harvesting of resources such as wood and medicinal plants.

Varty, like the Bop Parks Board, stresses the need to involve the local community in the reserve and have it benefit. "Without their support you can very easily be put out of business by, for example, simply having your ground burnt out."

Bop National Parks deputy director Steve Johnson says: "Our approach is utilisation in order to conserve. We are not preservationists. We see wild plants and animals as products of the land that must be harvested in order to improve the quality of life for its people. Money derived from controlled hunting on tribal land is ploughed back into the communities where the game was hunted."

Vorhies welcomes Phinda as a key development in the privatisation of conservation, which, he points out, has already progressed further than elsewhere in Africa. He says the big challenge for Varty will be to make the switch from a family business—Londolozi—to a corporate environment.

Vorhies adds that SA has benefited from the diversity of approaches to game conservation that have developed, such as the Bophuthatswana and Gazankulu models, the private reserves such as Londolozi, the Natal and National parks boards and the various provincial authorities.

He says this is far preferable to having conservation all under the control of one central body, as is the case in Kenya and Tanzania, or would be in SA if, for example, the National Parks Board were to take over all major game reserves.

Vorhies is severely critical of the National Parks Board but believes it appears to be changing, judging by the development of Richtersveld National Park, which is taking the interests of local communities into consideration.

Johannesburg Gets Unique Waste Recycling Plant

92WN0077A Johannesburg ENGINEERING NEWS in English 20 Sep 91 pp 1, 2

[Article by Jill Stanford]

[Text] An R8-million mechanical recycling plant, believed to be the only one of its kind in the southern hemisphere, has been opened at the Robinson Deep landfill site in Johannesburg.

Waste and refuse from the central business district is received at the plant 24 hours a day, six days a week, at a rate of about 1,500 tons a day.

"Of this amount, 360 tons to 400 tons can be recycled," says Martin Blomerus, project engineer for Basil Read whose subsidiary Waste Flow is operating the plant.

The plant is being operated on a two shift basis for 18 hours a day using a high technology mechanical screening system and about 100 sorters a shift who sort and bale the incoming material into its main recyclable components of various grades of paper, plastics and metals.

A conveyor system, manufactured by Paarl company, Ackura Engineering feeds the recyclable waste into a 25.5 ton drum screen separator, designed and locally manufactured by Buhler SA.

This 15 m long, three metre diameter drum separates the organic and unsellable portion of the waste at a rate of 450 m^3 an hour (or 45 tons an hour).

"By having sections in the drum adjusted to suit the waste, the three sorting belts can be mass balanced," explains Matthys de Wet, director (industries) of Murray Biesenbach and Badenhorst, the civil and mechanical design engineers for the project.

"After sieving out the 60 mm portion of the waste stream, the drum splits the rest of the waste into three fractions: 60 mm to 190 mm; 190 mm to 250 mm and 250 mm plus."

The three fractions are then fed on to three 36 m long variable speed drive conveyor belts where the 100 sorters manning the belts sort the paper, plastic and metal into separate bunkers from where it compacted to 100 kg/m^3 and baled.

Construction of the plant was carried out by Bird Construction, while the main civil contractor, Basil Read, handled the initial earth works.

Vaal Med Engineering did the structural steel works and DC Electrical did the domestic and mechanical electrical work.

Electrical design consultant Integrated Professional Engineering Services (IPES) completes the design team.

Expansion of Rocket-Fuel Testing Site Into 'Biosphere Reserve' Opposed

92WN0081A Johannesburg THE STAR in English 23 Sep 91 p 10

[Article by James Clarke: "Rocket-Fuel Row Ignites Over Floral Kingdom"]

[Text] **Globally the Kogelberg may be more important than St. Lucia, but Armscor wants to expand a rocket-fuels testing site there.**

A second St. Lucia-type row has erupted around another beautiful part of South Africa—the Kogelberg, east of False Bay.

Natal's St. Lucia was named as a wetland of international importance—yet a mining company may be allowed to mine there.

Similarly, the Kogelberg is deemed "a region of global importance"—yet a parastatal is testing rocket fuel there and wants to expand.

The flower-filled Kogelberg is being submitted as southern Africa's first "biosphere reserve"—a reserve whose species diversity is considered globally important.

Biosphere reserves have to be registered by Unesco (United Nations Educational, Scientific and Cultural Organisation) and the idea is to set aside enough of them to form reservoirs for the earth's gene pool and thus guard against the current series of extinctions.

The world is divided into six floral kingdoms, the tiniest being the Cape Floral Kingdom which amounts to less than one percent of the world's land surface.

The Cape Floral Kingdom has a greater variety of plants than the world's largest floral kingdom—and the Kogelberg is its nucleus.

The area accommodates an Armscor subsidiary, Somchem, which tests rocket fuels in an idyllic valley. Somchem wants to expand.

Those fighting the move point out that when Richards Bay Minerals wanted to mine at St. Lucia, the Government insisted on an expensive and comprehensive environmental impact assessment.

Somchem is under no such obligation.

Professor Dennis Cowen, environmental law expert who lives at Rooi Els hamlet below the Kogelberg, told a

Johannesburg law conference last week that Somchem should not only be forbidden to expand, it should be removed.

He said afterwards: "The Department of Environment Affairs and the Cape Provincial Administration (CPA) are keen to submit the Kogelberg to Unesco as a biosphere reserve—there are only three or four places in southern Africa deserving of that rating.

"In the literature being circulated regarding the area, no mention of Somchem's presence is made. Not even in the official brochure which will go to Unesco.

"Yet it is not a State secret.

"The incongruity of Somchem's presence is bizarre.

"If the report goes to Unesco with no mention of Somchem's presence, then we would be fraudulently representing the situation."

(The Kogelberg means "bullet mountain.")

The reserve is described by the CPA as "the core of South Africa's fynbos region" and 20 percent of all fynbos species are found there.

A CPA brochure describes the area as of "extreme conservation importance" and sees it as the most important concentration of plant life in the entire Cape fynbos region from the Cedarberg to Port Elizabeth.

The area covers 30,000 ha and only Kruger Park, 66 times larger, has more plant species. Britain, 100 times larger, has fewer plants and animals.

The Kogelberg State Forest is the core of the Kogelberg. Maps show a 400 ha enclave cut into the forest, labelled MCA—mountain catchment area.

Yet this is the Somchem site.

MCAs are, next to national parks, the most jealously protected areas in South Africa because of their importance to water supplies.

Yet much vegetation was removed to build Somchem.

Somchem tests its propellants at night and sometimes weekends.

Locals say the noise can sometimes be heard 20 km away.

The councils of the Kogelberg—Rooi Els, Pringle Bay, Betty's Bay and Kleinmond—are opposing not just the expansion of the facility, but its continued presence.

Professor Cowen said: "We are not opposing Somchem on what they might be planning. Our opposition comes from 12 years of being their neighbour."

Somchem says it spent R41 million establishing itself but locals say the cost was R11 million.

Somchem says it has preserved the fynbos—its site is surrounded by a security gate—and has made many moves to be a good neighbour.

But Martin Warburg of Betty's Bay says: "They came to one meeting of ours, in May 1990, and we've not seen them since."

The lobby feels that the authorities "at the time Somchem was built—in 1979—did not bring their proper minds to bear (on the matter). It was a time of 'total onslaught' and their minds were preoccupied.

"Such a decision would never have been contemplated today."

Expert Warns of Water Resource Depletion

92WN0077B Johannesburg ENGINEERING NEWS in English 27 Sep 91 p 13

[Text] Indications are that South Africa's available water resources will not be able to cope with the demand by the year 2020.

It is therefore essential to continue developing technology to optimise the country's water resources, says Piet Odendaal, executive director of the Water Research Commission (WRC).

South Africa is a major world leader in technology for the recycling of water, and a major part of this research has been carried out by the WRC.

The commission's research will be one of the topics discussed at an international symposium in Spain on the reuse of effluent water.

"There is a lot of international interest in our experience in the recycling of water, particularly in our research on the health aspects of the problem" Odendaal says.

"Countries like Israel, Spain and Japan are particularly interested in our technology," he added.

The purpose of one of the commission's latest projects on the Cape Flats is to determine whether a local authority can operate a water recycling plant without any specialised input and if drinking water can be recycled from treated sewage.

Research results indicate that local authorities will be able to produce water that will be suitable for human consumption.

Odendaal says recycling of water has been done in South Africa on a large scale for many years, "but there is still room for new and better technology."

President's Council Calls for Declaration of Environmental Policy

MB2210075991 Johannesburg SAPA in English 0429 GMT 22 Oct 91

[Embargoed by SAPA until 1230 GMT on Tuesday 22 October]

[Text] Cape Town Oct 22 (SAPA)—The President's Council report on a national environmental management system, which was tabled on Tuesday, recommends that high priority should be given to the declaration of an environmental policy.

It further recommends that the minister be authorised to declare environmental policy without first having to secure the approval of various ministers. It should, however, be done on the advice of the proposed environmental council and his own department.

A recent trend indicating a greater willingness to make provision for public participation in administrative decision-making and formulating of legislation was strongly supported.

The report says there was a tendency to delegate legislative control over wide fields to ministerial discretion and was underscored by the accelerated pace of devolution of power.

"Control by Parliament would be most appropriate. Unfortunately it appears that Parliament's own scrutiny of subordinate legislation is almost nonexistent and therefore fails to constitute a safeguard of any consequence. Repea?ed proposals for reform, dating back to the 1940's, have failed to come to fruition. This problem deserves the attention of Parliament."

From a legal point of view, the establishment of an environmental ombudsman could contribute towards improved relatio?s between governmental bodies and concerned citizens and towards improved decision-making by these bodies.

The report also recommends the establishment of an environmental appeal tribunal.

"An opposite type of appeal would be that which would seek to ensure that the public interest in environmental conservation has been satisfactorily advanced.

"Provision for such an appeal could, in principle, provide a mechanism through which an independent assessment may be made as to whether or not the public interest in conservation was satisfactorily promoted or at least taken into account. This would remedy one of the most serious shortcomings of our environmental law."

It was also important that there should be close cooperation between the bodies responsible for the administration of environmental legislation and those concerned with criminal justice.

Although desirable, it was not essential that the police establish specialised environmental units but if a charge involving criminal pollution was laid, the police should at least be required to refer the case to the relevant specialised body.

The report says another problem was that officials of these specialised departments investigating a case usually had no legal training which could result in much of their valuable work being negated.

To overcome this, officials should receive some training in the law of criminal procedure and the law of evidence.

A further suggestion was that these departments should have their own prosecutors specialising in the relevant field of criminal environmental law. Alternately, the Department of Justice could be encouraged to include an environmental component in the training programmes for prosecutors and magistrates.

Universities and technikons should also be encouraged to promote the study of environmental law.

A review of all criminal penalties was urgently required to bring them into line with the seriousness of the offences.

It is recommended that a constant search be conducted to find alternative and more effective environmental remedies than t?e criminal sanction.

The introduction of environmental audits merited serious consideration. A further potentially effective incentive was the requirement of environmental qualifications before government contracts, subsidies or loans were awarded.

An example was the condition that drought aid subsidies would only be available to farmers who had applied conservation farming principles.

It is recommended that much more use of such strategies should be made.

ZIMBABWE

Swift Action Urged on Manyame River Basin Pollution

92WN0062B Harare THE HERALD in English 3 Sep 91 p 6

[Article: "Swift Action Needed To Control Pollution"]

[Text] Harare City Council, Chitungwiza Town Council and the other local authorities supposedly overseeing the industrial boom in the Manyame River basin must now act swiftly, together and effectively, to control water and air pollution and manage the river system properly. If they do not, about two million people, 20 percent of the entire population of Zimbabwe, are going to be poisoned in their own wastes.

Several recent reports have highlighted the dangers. And the same reports have brought into the limelight the incredible attitude of local and Government officials who can do nothing but wring their hands, say it is someone else's fault, never theirs, and in any case they do not have the legal power or the responsibility to do anything except apparently gaze in wonder as smog covers the city and raw sewage and other contaminants flow into the supply dams.

About 10 days ago, smog enveloped much of Harare, trapped by an inversion layer and fuelled by burning rubbish as well as industrial and vehicle fumes and cooking fires. City officials admitted many could suffer if the weather did not change but said they had no legal power to shut down smokey industry. The Health Ministry said Harare never asked for the powers and, anyway, it was Zesa's fault for not electrifying more houses. Fortunately, the weather changed, this time.

A few days later, a water pollution expert noted that raw sewage was being dumped in one river and ended up in Lake Chivero and a fertiliser factory and chicken farm were the two worst sources of phosphates flowing into the same lake, feeding the water hyacinth. Rotting hyacinth would endanger the supply of clean water.

Officials in the past have admitted the problems of water pollution in the Manyame system and agreed the problem is growing worse. They also note populations are expanding and argue over who is responsible for upgrading sewage works and stopping contamination.

The buck-passing impresses no one. The average person paying hard-earned money to local authorities wants service, not excuses. The relevant councils and their officials must first change their attitude and accept responsibility to sort out the mess.

They must act in concert. Geography rules out uncoordinated action. Almost everyone needs to draw water from the big Manyame and Chivero dams, downstream of the urban and industrial areas. This is an advantage since it allows scarce water to be recycled, but only if wastes are properly processed and contamination is kept out of the system.

The technology exists. Some of Harare's sewage plants are the most modern in the world and have won engineering prizes. We need more, not just for Harare but also for Chitungwiza, Ruwa, Mount Hampden and Norton since their wastes also end up, eventually, in those big dams.

The time has now come to create a single authority to supply processed water in bulk to all urban and industrial centres in the Manyame basin and process the waste. The authority would own or control storage dams, water works and sewage processing plants. There would be a small board of control, either directly elected at the time of municipal elections or indirectly appointed by the councils.

The authority would have the power to force polluters to clean up their act and would have the direct responsibility to ensure adequate supplies of clean and safe water.

Individual urban authorities would retain responsibility for laying and maintaining water reticulation and sewerage networks, agreeing with the basin authority where on their border they would draw bulk supplies of treated water and where they would deliver raw sewage for processing.

The basin authority would have a standard charge for all bulk supplies and processing. Water and sewage fees for each consumer would thus be composed of two elements, the on-passed charge from the basin authority and the local authority's reticulation charge.

It is important that we move swiftly to contain the ever-growing problems and ensure that rapid development can take place without destroying our water or driving its cost up to ridiculous levels.

Satellite Data on Environmental Pollution in Jiaozhou Bay

40091003A Beijing ZHONGGUO KONGJIAN KEXUE JISHU [CHINESE SPACE SCIENCE AND TECHNOLOGY] in Chinese Vol 11 No 3, Jun 91 pp 12-17

[English abstract of article by Zheng Quanan [6774 0356 1344], Zhang Xinmei [1728 2946 2734], et al. of the First Institute of Oceanography, State Oceanic Administration, and Xu Hongkai [1776 7703 2818] of the Qingdao Institute of Environmental Protection Science; MS received 9 Sep 90]

[Text] The analysis of the pictures of Landsat TM and the photos of our land resources satellite camera and the on-the-spot investigation show that the pollution caused by industrial waste water on the eastern coast of Jiaozhou Bay is very serious. The main pollution sources concentrate on along the Haipo river, Licun river, Loushan river and Changkou District coast. The width of polluted water area is up to 4-7 km, and it spreads to the sea outside the bay with down stream. The area of polluted region "White Sands" caused by the drained wastes from Qingdao Alkali Factory amounts to 0.53 km^2 at present. The atmosphere in Qingdao City is seriously polluted, where the smoke plume is up to 14 km wide, drifting down the wind and reaching 30 km far away, which will certainly bring about the disaster such as acid rain.

Subject Term: Environmental pollution, Remote sensing information, Analyzing, Satellite.

State Pays Millions for Pollution Research

40101001A Beijing CHINA DAILY (NATIONAL) in English 28 Aug 91 p 3

[Article by staff reporter Zhu Baoxia]

[Text] Scientific and technical research into environmental protection will receive about 100 million yuan ($19 million) in government funds between 1991 and 1995.

Zhou Siyi, vice-director in charge of scientific and technological research under the National Agency of Environmental Protection of China, said the agency would contribute 4 million yuan ($754,716) each year for the work.

The State Scientific and Technological Commission has also agreed to allocate 80 million yuan ($15 million).

Most of the research projects will aim at preserving the atmosphere and water conditions and disposing of harmful solid refuse that could contaminate the surroundings and affect people's health, said Zhou.

Six of the projects have been included into the State programme: purification and reuse of waste water; disposal of harmful and poisonous solid refuse and urban rubbish; comprehensive treatment and preservation of ecological environments; recycling of solid refuse; control of acid rain; and ways of handling the global climate changes.

Zhou stressed that more must be done to expand application of the research achievements acquired during the previous five years.

An information and data bank should be set up and perfected to provide the central government with timely information on environmental situations throughout the country and to figure out policies.

There are now more than 200 institutes engaged in scientific and technological research concerning environmental protection and treatment, with more than 16,000 staff.

According to an annual report by the National Agency for Environmental Protection this year, the country's large cities still suffer from heavy air pollution and the atmosphere of small cities is worsening. More domestic sewage was drained into local rivers, contaminating tap water supplies.

Last year, large factory chimneys churned out some 8,500 billion cubic meters of waste gases, a 2.8 percent increase on 1989. Some 15 million tons of sulphur dioxide and 21 million tons of industrial dust were spewed into the sky.

Northern cities were more polluted than those in the south, with an average in the north of 475 micrograms of suspended particles per cubic metre, 44 percent up on their southern counterparts. The nation's average was 387 micrograms per cubic metre.

Shijiazhuang, Nanchang, Jilin, Urumqi, Luoyang, and Tangshan were among the most dusty cities. Chongqing, Guiyang, Yibin, Shijiazhuang, Qingdao, Nanchang and Urumqi suffered seriously from sulphur dioxide pollution.

Although acid rain had not spread across the country, it had expanded in the south and southwest.

Some 35.4 billion tons of waste water were drained into rivers and the sea, two-thirds being industrial waste water and the rest domestic sewage.

Industrial waste water was 1.4 percent down and domestic sewage 4 percent up on 1989.

Water quality in the Huaihe River system in Anhui and Jiangsu provinces and Liaohe River system in Northeast China continued to worsen, of 94 rivers passing through cities, 65 were polluted.

Five-Year Goal Set To Control Pollution

40101001B Beijing CHINA DAILY (NATIONAL) in English 17 Sep 91 p 3

[Text] China has mapped out a dual-purpose five-year plan to control air pollution while simultaneously launching massive economic development projects.

Environmental protection has been made China's State policy and Chinese Premier Li Peng has called on the Chinese people to curb environmental pollution in the urban and rural areas throughout the country within the next five years.

The goals of the country's environmental protection programme are to limit the discharge of sulphur dioxides to 19 million tons, to treat 74 percent of industrial waste gases, and to enable 50 percent of the country's urban residents to use liquid and gas fuel by 1995. To control acid rain, China hopes to hold emissions of sulphur dioxides at the 1990 levels despite the predicted rise in coal consumption.

The current programme stipulates that over 70 percent of China's industrial waste water will be treated before it is discharged into rivers and streams, and that re-vegetation projects will increase by five percent in all the cities and towns.

The Chinese premier also said that "we need to redouble our efforts to publicize and explain the environmental protection policy, to promote environmental science and technology, and to raise the entire nation's environmental consciousness."

The premier called on governments at all levels, as well as various departments, enterprises and institutions, to strictly enforce laws, statutes, and policies pertaining to environmental protection.

Qu Geping, director of the National Environmental Protection Agency (NEPA), said that the major tasks would be to halt the deterioration of urban environments, protect drinking water sources, improve and preserve environmental quality in residential and tourist areas, and maintain an acceptable level of environmental protection in line with the level of economic and social development.

Qu explained that priority would be given to environmental protection in urban areas, where waste discharges accounted for 80 percent of the country's total. Air, water, and noise pollution, as well as solid waste, are already inhibiting development of the national economy. To this effort between 1986 and 1989 the State invested over 11.4 billion yuan ($2.15 billion) and 220 billion yuan ($41.5 billion) more will be invested to develop new technology and equipment designed to improve environmental protection during the next decade.

The funds earmarked for environmental protection will represent some 15 percent of the total funds planned for industrial development.

In addition, China hopes to receive financial assistance from other countries over the next 10 years to assist its environmental protection programme.

The environmental protection funding will go mainly to the energy, chemicals, cement and paper-making industries, the major polluters of China's environment. The money will be used to update technology and equipment to make more efficient use of raw materials and reduce waste.

About 70 percent of China's pollution comes from industry and nearly 400,000 small, coal-consuming boilers in China need to be upgraded with the latest technology and equipment.

Coal burning each year releases 20 million tons of smog dust, 80 percent of all solid wastes, and 15 million tons of sulphur dioxide (90 percent of all sulphur dioxide emitted annually in the country).

Nevertheless, technological and economic constraints demand that coal remain the main source of energy in China for many years to come. Thus, beginning on July 1 this year China began to enforce detailed regulations concerning limits on pollutants and waste discharges. Industrial enterprises must now submit detailed lists of their pollution control and environmental protection practices. (Xinhua)

Environmental Work Now a Top Priority

40101003A Beijing CHINA DAILY (Environment) in English 1 Oct 91 p 6

[Article by Tang Ying]

[Text] **Protection of the environment is imperative if China is to promote a sustained, steady and sound development of its national economy. The country is now pulling out all the stops to avert a grim scenario in which 'double economic growth brings double pollution.'**

Environmental protection has traversed a course of 17 years since the leading environmental protection panel under the State Council was set up in 1974.

To protect the environment is imperative in promoting the sustained, steady and sound development of the national economy. China has attached great importance to environmental problems and made it a basic national policy.

Due to the reform and open policy, gross national product doubled during the Seventh Five-Year Plan period (1986-1990). But thanks to the correct policies and measures adopted, the country has prevented to a certain degree the grave situation of "double economic growth bringing double pollution," said Zhang Qunmin, deputy administrator of the China National Environmental Protection Agency (NEPA).

Environmental departments at all levels have exerted all their strength in the prevention and control of environmental pollution.

In co-ordination with relevant state economic departments, Zhang said that the environmental protection departments have adopted a series of economic and administrative measures.

Following the three effective measures called environmental effect assessment, "three synchronizations" and levies on pollutant discharges, five systems have been formed. They include a responsibility system for environmental protection targets, a quantitative testing system on comprehensive control of urban environment, a system of pollutants discharge licensing, centralized control over pollution and a time limit for bringing pollution under control.

The five systems are very important to eliminating environmental pollution in China, and should be carried out all over the country.

Over the past 17 years, great achievements have been made. According to the China Environmental Situation Bulletin (1990), the country invested 7.1 billion yuan in industrial pollution control last year, 2.2 percent decrease of the previous years.

The purification rate of industrial waste water in 1990 increased to 32.2 percent from 29.9 percent in 1989; the treated rate of industrial waste gas up by 3.9 percent; and the rate of comprehensive utilization of industrial solid waste up 5 percent.

A series of laws and regulations have been issued and environmental institutions have been strengthened.

But the environmental situation in China is still grim. Atmospheric pollution in China's large and medium-sized cities is very serious and the situation is also deteriorating in small towns.

According to the Bulletin, the total amount of waste gas exhaust nationwide (excluding those from township and rural enterprises) last year was 8,500 billion standard cubic metres, an increase of 2.8 percent over that of 1989, of which, the volume of sulphur dioxide exhaust was 14.9 million tons.

Due to widespread coal burning and backward utilization technique, the total average annual volume of suspended particles in the northern cities is over 475 mg per standard cubic metre, and 268 mg per standard cubic metre in southern cities.

Many cities are often filled with smog and the areas affected by acid rain are extending from South and Southwest China to East China.

Water is the origin of life. Lack of control or effective control of water pollution will pose a serious threat to the survival of China's 1.1 billion people and to the sound development of its industrial and agricultural production and other social undertakings.

In 1990, the amount of waste water discharged nationwide (excluding those from township and rural enterprises) was 35.4 billion tons, 24.9 billion tons of which were industrial waste water and most of which was directly discharged into water bodies without being treated.

Monitoring of 94 river sections running through cities shows that 65 of them were exposed to pollution to varying extents. Owing to the excessive exploitation of underground water, the surfaces of over 36 cities have sunk seriously including Shanghai, Tianjin, Suzhou and Changzhou.

The amount of industrial solid waste nationwide (not including those from township and rural enterprises) came to 580 million tons, of which the discharged volume was 50 million.

The untreated and unused industrial waste residue and urban waste is piled up in the city outskirts with a total volume of 6.5 billion tons, occupying a total area of 58,390 hectares, becoming the second source of serious pollution.

Urban noise, especially traffic noise, is another major public hazard which affects the livelihood and physical health of the people.

The noise level in Chinese cities is usually at high decibels. According to the Bulletin, noise caused by traffic in 1990 accounted for 32.7 percent of the total urban noise, noise by daily life 40.6 percent and noise by industrial and construction operation 26.7 percent.

In 1990, 3,462 pollution accidents occurred in China, 3.9 percent higher than 1989.

The ecological balance is continuing to deteriorate in the whole country. The total area suffering from water and soil erosion has topped 150 million hectares, accounting for 15.6 percent of the total in the country. The pollution caused by the use of pesticides, fertilizers and agricultural firms has seriously affected the eco-agricultural environmental quality.

Grasslands have degenerated rapidly and land desertification is still expanding. Along with the rapid development of township and rural industries, environmental pollution is likely to spread further in some areas. Because these rural enterprises usually take no environmental protection measures and their production technology is backward.

In the face of a deteriorating environment, the concerned departments had set some excessively high and unrealistic targets with the intention of rapidly reversing the deteriorating trend and creating a clean, comfortable and beautiful environment as soon as possible. But those targets were not in accordance with China's economic and technological basis and they failed to be carried out.

Practice has shown that practical environmental problems could not be solved by mere good intentions and that in our environmental protection efforts, we must work out measures based on China's actual situation and act according to our capability while giving priority to major projects.

"According to numerous research data, to basically solve the pollution problem this century requires some 640 billion yuan, accounting for 2.4 percent of the GNP of the corresponding period of time," said Qu Geping, administrator of NEPA, in his work report to the third National Conference on Environmental Protection in 1989.

But for China, a developing country with such a large population and so far undeveloped economy, it is impossible to allot such a large sum of money to pollution control. So we should prepare ourselves for a long-term fight against pollution.

In 1992, the target of environmental protection is to halt the deterioration of environmental pollution and check the deteriorating trend of the natural ecology.

Marine Environmental Monitoring Station Built in Zhejiang

OW2410140391 Beijing XINHUA in English 1320 GMT 24 Oct 91

[Text] Beijing, October 24 (XINHUA)—China's first marine ecological environment supervision station was completed after three years of construction here in Zhoushan city of eastern Zhejiang Province, today's CHINA ENVIRONMENT NEWS reported.

With a total investment of nine million yuan, the station was built jointly by the State Environmental Protection Bureau, the Ministry of Finance, Zhejiang provincial government, and the local government of Zhoushan.

The station is equipped with a supervision ship which can navigate in the sea for 15 days in succession, making investigations and samples concerning marine hydrology, meteorology, and other important environmental matters.

The station bears the tasks of supervising major pollution sources in the Zhoushan fishing area and the neighboring sea areas, and of studying the influence of major pollutants on the marine ecosystem.

Impact Study for Quinshan Nuclear Plant Completed

OW2710173591 Beijing XINHUA in English 1531 GMT 27 Oct 91

[Text] Beijing, October 27 (XINHUA)—China National Nuclear Corporation announced today that an environmental impact study for second phase construction at the Qinshan Nuclear Power Plant in Zhejiang Province was completed recently.

The investigation is a major aspect of preparations being made for the construction of two 600,000-kilowatt nuclear generating units during the Eighth Five-Year Plan period (1991-1995). The first phase of the project is nearing completion.

The study covers the population, land-use, forests, aquatic products and other resources and lists industrial and agricultural production within a 300 kilometers of the site for the second phase.

The study also includes data concerning external factors, and conditions for coping with emergencies, as well as use of the construction achievements recorded during the first phase.

Corporation officials said that the results of the study provide a complete and reliable basis for designing the second phase project.

Beijing Water Shortages Prompt Introduction of Regulations

HK3010050491 Beijing CHINA DAILY in English 30 Oct 91 p 3

[By staff reporter: "Water Use Regulated by Strict New Quotas"]

[Text] In an effort to mitigate its serious water shortages, Beijing has approved its first water conservation regulation, which will go into effect November 1. The regulation stipulates the management of water consumption both in the workplace and at home.

The plan asks for water conservation departments to draw up comprehensive plans for water consumption each year. After the plan is approved, departments will then assign each unit a water consumption quota. Those who surpass the quota will be fined, and construction projects that use large quantities of water will be controlled. Meanwhile, the capital encourages research on and development of water-saving methods and urges all residents to conserve water whenever possible.

According to the regulation, urban residents will pay a sum relative to the amount of water they use. The old system, where city residents paid only a small fixed monthly fee regardless of their water use, will be eliminated.

Punishment

Because of its increasingly severe situation, Beijing is trying to emphasize water conservation by punishing violators. Anyone breaking the regulation will be warned, fined or have his water turned off.

Because there were no recycling facilities for freezers and refrigerators in the Yanshan Hotel, and more than 80 percent of its rooms had water leakage, it was fined more than 9,900 yuan ($1,868) last month.

Such penalties had been enacted before and several units were fined earlier this year.

In August, Beijing Film Studio was fined 14,400 yuan ($2,717) for failing to fix water metres for those living in its residential compounds, but continuing to charge them a fixed fee.

Feng Yiqian, director of the Beijing Water Conservation Office, said the city's water shortage has been getting worse.

The droughts of recent years have diminished the city's underground water supply and Beijing's annual water consumption reached 4.2 billion cubic metres. Although this is the maximum amount for a normal year, it is well beyond the 3.3 billion cubic metre limit for dry years.

International Symposium Held To Develop, Protect Huangshan Mountain

OW3010223391 Beijing XINHUA in English 1530 GMT 30 Oct 91

[Text] Huangshan, October 30 (XINHUA)—A six-day international symposium on the coordinated development of tourism and environment ended here today.

The symposium was sponsored by the United Nations Environment Program (UNEP), the World Tourism Organization, the Chinese Environmental Protection Bureau and the Anhui People's Government.

It focused its discussions on how to protect the environment of the tourist attraction of Huangshan Mountain while fully and rationally utilizing and developing the tourism resources.

It also explored the possibilities of joint development of the Huangshan tourism resources by relevant international organizations.

Huangshan mountain has been listed as a world natural and cultural legacy by the Educational, Scientific and Cultural Organization of the United Nations last year. Protection of the scenic area and tourism development have aroused the concern of both Chinese and foreign organization experts.

More than 50 Chinese and foreign experts participated in the symposium which coincided with the opening of the Huangshan International Tourism Festival.

While appreciating the great efforts made by the Chinese Government to protect the environment and develop the tourism resources in Huangshan, some foreign experts urged the Chinese Government to adopt measures to restrict the use of some scenic spots, set up a system for collecting data about tourism and the environment and make the data the basis for planning and decision making.

The specialists also requested China to review and readjust the overall plans for the development of the tourism zone, strengthen the education of the working staff and the public so that they will become more environmentally conscious and improve the infrastructural facilities and service.

UNEP officials and the World Tourism Organization promised their support to the Chinese Government in its efforts to develop tourism aimed at improving the environment and help China seek international funds for revising the nation's tourism development program and research, including assessment of the receiving capacity, research in the ecological system and the treatment of waste water, sewage water and litter.

Government Seeking To Join Montreal Protocol

OW0611082191 Taipei CNA in English 0740 GMT 6 Nov 91

[Text] Taipei, Nov. 6 (CNA)—The Republic of China [ROC] will apply to join the Montreal Protocol in order to contribute to the preservation of the world's ecology, Vice Economic Affairs Minister P. K. Chiang announced Tuesday.

The Montreal Protocol, signed in 1987 with 37 signatories, was initiated by the United Nations as part of its efforts to control the use of chlorofluorocarbons (CFCS), Chiang explained.

CFCS are widely used as spray-can propellants, refrigerants and industrial solvents. As the chemicals harm the ozone layer of the earth, Chiang said, the UN wants to restrict global CFC emissions through multilateral cooperation.

In applying to join the Montreal Protocol, Chiang said, the government will follow the mode it has used in applying for a seat in the Geneva-based General Agreement on Tariffs and Trade (GATT).

The Republic of China applied to join GATT in January 1990 under the name of "Taiwan, Penghu, Kinmen and Matsu Customs Territory." The world trade regulatory body is expected to consider the ROC's application soon.

Chiang reported that the Ministries of Economic and Foreign Affairs and the cabinet-level Environmental Protection Administration have met many times to discuss ways to join the Montreal Protocol and to take part in other international environmental protection programs.

As part of its efforts to protect the global environment, Chiang said, the United Nations is also inviting member countries to sign a multilateral accord on the control of carbon dioxide.

Stricter controls on carbon dioxide emission means higher standards for thermal power plants, Chiang explained. To cope with the new world trend, he said, the government must formulate a new energy policy.

REGIONAL AFFAIRS

East Asian Resource Recycling Symposium in Tokyo

OW0411080391 Tokyo KYODO in English 0737 GMT 4 Nov 91

[Text] Tokyo, Nov. 4 KYODO—East Asian economies will hold their first resource recycling symposium in Tokyo Tuesday and Wednesday, organizers said Monday.

Among some 300 participants of the symposium at Waseda University, will be researchers and technicians from universities and enterprises in Japan and five other Asian countries, including South Korea, China, and Taiwan, as well as Japanese local government officials, the sources said.

They will discuss each nation's recycling situation including techniques for metal resources recycling, with the aim of strengthening cooperation among companies, research institutes, and local governments, they said.

The symposium would also provide a chance to expand an information network to other Asian areas.

In Japan, where a recycling law was implemented on October 25, a system is in preparation to reuse resources from home appliances, communications equipment, and industrial machinery, while the fast- growing East Asian economies are also actively pursuing recycling of resources, the sources said.

The East Asian nations are interested in Japan's advanced collecting technology, though recycling of scrap iron, disused cars, and electronic parts is currently paying well because of relatively low labor costs, the sources said.

The attendants will visit Yokohama City's central wholesale market, where recycling of styrene foam is being undertaken, as well as copper and aluminum refineries.

INDONESIA

'Stern' Measures Adopted Against River Polluters

BK2310123991 Jakarta ANTARA in English 1005 GMT 23 Oct 91

[Text] Jakarta, Oct 23 (OANA-ANTARA)—House members here Tuesday welcomed State Minister for Population Affairs and the Environment (KLH) Emil Salim's stern measures against river polluting companies and expressing the hope that there would no discrimination in the imposition of the sanctions.

Machkbon of the house's environmental affairs commission and Budi Harjono of the industrial affairs commission said that it was very timely for Minister Salim to announce the names of industries found to have polluted a number of rivers.

They shared the opinion that the government so far had always been very tolerable towards polluting companies.

"As a result, such companies do not take the environmental protection law seriously," they said.

The KLH minister while announcing the names of 39 river polluting industries Monday also promised to bring them to court unless they fulfill the obligation to install waste water treatment facilities at their factories by end of December this year at the latest.

Under government regulations, industries that caused pollution and environmental damages can be tried in a court of law with punishments that vary from temporary closure of factories, revocation of operational licenses, fines of up to rupiah 100 million, to 10 years of imprisonment.

Harjono said Minister Salim's statement must be supported by all parties including the law enforcement officials without taking into consideration whether the imposition of stern sanctions would affect the flow of foreign investments here.

"Industrialists actually should not be afraid of the sanctions they must face or the environmental protection law because as it has been generally known 'polluted reputation' is the worst kind of publicity," he said.

Meanwhile, some companies included in the "Black List" of Minister Salim like Pt. Khong Guan Indonesia, Pt. Pfizer Indonesia, Pt. Dumex Indonesia Tuesday refused to give a comment on the issue, saying that the officials in charge were either attending a meeting or not at the office.

However, most of the companies known to be reluctant to install waste water treatment facilities said that such facilities were very costly and would only increase their investments and operational budget.

They said higher investments and operational budget in their turn will only push up the price of their products, an argument which has been counterattacked by a number of environmentalists who claimed that the social costs that the people must shoulder because of polluting companies were already too high.

Indonesia through the KLH office since 1989 has actively campaigned for clean river program in 11 of its 27 provinces across the country.

JAPAN

Power Institute To Provide PRC With Desulfurization System

OW2610212691 Tokyo SANKEI SHIMBUN in Japanese 23 Oct 91 Morning Edition p 9

[Text] There are growing concerns that mixed in rain, sulfurous acid and nitrogen gases that are exhausted from Chinese thermo power plants will possibly cause

acid rain damages to various places all over China and Japan. Under such circumstances, the Central Research Institute of Electric Power [CRIEP] (with Nao Yoda as chairman) decided on 22 October to provide technology related to simplified desulfurization equipment to China in cooperation with such companies as Mitsui & Company Limited and Ishii Iron Works Company Limited. The CRIEP plans to send a survey team to Liaoning Province in China next January, and start building plants in several places from the fiscal 1993. Moreover, the CRIEP is studying the possibility of obtaining the Official Development Assistance to reduce the Chinese share of the costs.

The CRIEP plans to transfer its technology of the coal combustion environment system. The thermo power system using coals discharges a large quantity of sulfurous acid gas. However, the CRIEP combustion system has capability of mixing crushed limestones with coals and causing their combustion in the boiler.

In this way, combined with calcium element in the lime, sulfurous acid gas will be turned into plasters, and discharge of sulfurous acid gas into the air will be drastically reduced in quantity.

In the mid-1960s, the CRIEP developed this system for use at thermo power plants. However, the CRIEP could not put this system to practical use because another desulfurization and denitration equipment, having a higher performance, was developed during the same period. When the new plant to be built under joint development with China is completed, the system will be put to practical use for the first time in about 30 years.

The desulfurization and denitration equipment currently used in Japan has better functions than that of this simplified system. It will need approximately 30 billion yen to build the Japanese-type desulfurization equipment. However, when equipment is taken into consideration, the only equipment needed at a simplified plant is a pulverizer. Therefore, it will take approximately 50 million yen, about one-sixtieth of the cost for a Japanese-type deslfurization system, to build a simplified plant. As far as the Chinese side is concerned, it has decided that it will be easier for China to agree to the simplified plant project.

The Chinese side is very interested in introducing the simplified system, and is studying a plan to use plasters discharged from the plant as materials for construction land reclamation and as fertilizers.

Nissho Head Proposes Environmental Technology Transfer to East Europe

OW2710044591 Tokyo KYODO in English 0430 GMT 27 Oct 91

[Text] Budapest, Oct. 27 (KYODO)—A visiting Japanese business leader said Saturday that Japan needs to consider transferring its environmental protection technology to Eastern Europe.

Shinroku Morohashi, chairman of the Japan Chamber of Commerce and Industry (Nissho), made the comments to reporters after visiting Poland, Czechoslovakia, and Hungary as the leader of the chamber's fact-finding mission.

"The transition to market economies is going on steadily in these East European nations, despite economic turmoil in the Soviet Union," said Morohashi, also president of Mitsubishi Corp., Japan's largest trading house.

Noting environmental problems assume serious proportions in economic reform efforts in the three countries, he suggested that Japan promote technological transfers to help resolve such problems.

Morohashi also said he has the impression that there is a great potential for business opportunities for Japanese companies in Eastern Europe.

All indications are that Japan's investment in the three East European nations will increase in the years ahead, he said.

THAILAND

National Environmental Board Drafts Policy Plan

92WN0029A Bangkok MATICHON in Thai 15 Sep 91 p 8

[Text] The Seventh National Economic and Social Development Plan (1992-1996) stipulates that protecting the environment and the quality of life is one of the main targets. The Office of the National Environmental Board has drafted a policy on controlling pollution and protecting the environment in line with the main policy in the Seventh Development Plan.

Concerning this, Mr. Santhat Somchiwita, the deputy secretary general of the National Environment Board, said that the country's environmental policy can be viewed as a framework for taking action. The policy has set specific targets. This can be divided into three parts: the national environmental development policy and measures, the environmental policy in the National Economic and Social Developmemnt Plan, and the policy on managing the natural resources and environment.

The National Environmental Board has summarized the problems involved in managing the natural resources and environment as follows:

The Main Problems in Managing Our Natural Resources and Environment in the Seventh Plan As Summarized by the National Environmental Board

1. The depletion of our natural resources: Past development has used various natural resources, particularly land, forests, water sources, coastal resources, and mineral resources, at a very high rate and in a very inefficient

manner. As a result, our resources are rapidly being depleted. This stems from not having a resolute management plan.

Forest resources: These are declining, and the trend has been one of constant decline. During the past 30 years, we have been losing an average of 3.02 million rai a year. Today, there are only 89.2 million rai of forests left. This affects control of the ecological system in general. Important reasons for this include the illegal felling of timber, encroachment on the forests in order to build houses and carry on farming activities, hill tribe slash-burn agricultural practices in headwater areas, encroachment on protected areas, and forest fires.

Water resources: Stored water is used in a wasteful manner. This water is not used in the best manner possible. Moreover, we have not considered the environmental effects. We do not have a plan for developing our water sources in line with the people's need for water. Our water resources are not managed in a systematic way in accord with the actual situation or in accord with the potential of the area.

Land resources and land use: Land is not used in accord with capabilities of the land. No thought is given to the effects on the environment, particularly the increase in saline soil in the northeast and the high rate of soil depletion and soil erosion. Important reasons for this include: the production of salt in the northeast using inappropriate technology, the encroachment on and use of forest zone land having steep slopes without giving any consideration to preserving the land and water, and the uncontrolled use of insecticides and fertilizers, which affects the ecological system.

Mineral resources: The use of our mineral resources in the form of ore and energy has had a great effect on the environment. In particular, there are the problems of mining in headwater areas, mining on both land and at sea, the use of lignite, and the development and use of petroleum on both land and at sea. This stems from the fact that suitable technology is not used and from the fact that the laws and acts on controlling and solving environmental problems are not clear or tough.

Coastal resources and coral: The coastal forest areas have been used for various things, including forestry, fishing, industrial, and mining activities. This has damaged the ecological system. Besides this, the coral reefs around the islands off our coasts have suffered great damage. Besides natural enemies, this destruction stems from tourism and from fishing activities. Fishermen use explosives, poisons, and nets to catch fish. Besides this, the coral is being killed by the dregs released by the mines on land and the drilling rigs.

Fishing resources: Our natural water sources are deteriorating. This is becoming a major problem for freshwater fishing. The expansion of the area under cultivation along our coasts has created more pollution and affected the ecological system and coastal resources. Moreover, the oceans have been over fished and are in a state of deterioration. This stems from the fact that we lack suitable and appropriate policies and targets concerning the production of aquatic animals. Moreover, fishermen and people in general have not cooperated very well.

2. Conflicts over the use of the natural resources: This problem, which has been a problem for a long time, stems from the fact that we have not formulated a plan to tie things together in a systematic way. For example, the use of forest resources has led to soil erosion, silt buildup in the rivers has created problems for agricultural development, and mining activities at sea have caused pollution and affected fishing activities. The felling of trees in coastal forest areas, which are sources of food for young aquatic animals will result in a decline in the number of aquatic animals.

3. The pollution problem:

Water pollution: In the canals and principal rivers, particularly in heavily populated and industrial areas such as along the Chaophraya, Klong, Tha Chin, and Bang Pakong rivers and along the coast in important tourist areas such as Pathaya, Hua Hin, and Cha-am, the water is so polluted that it should not be used. Besides this, the water in important urban areas such as Chiang Mai, Khon Kaen, Hat Yai, Chonburi, and Phuket is polluted. The main reason for this is that waste materials from communities, industrial and agricultural waste, and other waste matter is dumped into the rivers and canals.

Air and noise pollution: In Bangkok and other large cities, the quality of the air is declining. Black smoke is emitted by trucks and buses, and white exhaust is emitted by cars whose exhaust pipes are defective or whose exhaust pipes have been modified. Moreover, carbon monoxide is emitted by poorly-tuned vehicles that run on gasoline. The main reasons why the measures for solving the air and noise pollution problem have failed to achieve results are: The measures have not been implemented resolutely. The people do not realize the seriousness of the problem and are not aware of the need to cooperate closely to solve this problem.

Waste matter: The collection of garbage in the communities is still a problem. This is because the amount of garbage generated each day is beyond our collection capacity. As a result, 20-40 percent of the garbage is not collected.

Garbage in Bangkok: The uncollected garbage in Bangkok is polluting the water. This is because uncollected garbage is dumped in the water.

Garbage in municipalities and submunicipalities: Garbage collection and disposal in the municipalities and submunicipalities is still a problem. There are problems in collecting, transporting, and disposing of the garbage. This is because we lack a plan for making use of appropriate technology and methods suited to local conditions.

Excretion: The collection and disposal of human excretion has not been improved. Such waste matter is emptied into water drainage pipes or public water sources. At the same time, some people use waste disposal trucks to remove the waste and then dispose of the waste in an inappropriate way.

Residual poisons: Today, poisonous substances are used in various sectors without people being aware of the danger that they pose. This has led to problems with residual poisons. Besides this, poisons and heavy metals are emitted into the environment, and there are accidents involving poisonous substances. Our existing measures on controlling the import, transportation, storage, use, and disposal of such substances are not strict or efficient enough. Also, the people are not aware and do not have a correct understanding.

4. Organizational and legal problems and problems in implementing the plans: To control and solve the pollution problem and the problems having to do with the deterioration of our natural resources in an efficient manner, unified and all-round action must be taken. Legal and financial measures must be implemented, and suitable organizational forms must be used. But in implementing things in the past period, problems and obstacles have been encountered. These can be summarized as follows:

a. As a result of the limitations regarding the structure of the organizations and the dispersal of the various environmental units, there is a lack of unity in implementing things. Also, we lack regional-level organizations to take responsibility for solving the natural resources and environmental problems at the regional level. Besides this, the natural resources and environmental problems are international problems. Our present organizations, which are equivalent to a department, cannot deal with these problems in an efficient manner.

b. There is a lack of coordination in solving the natural resources and environmental problems. In particular, in protecting and monitoring the various conservation areas, no real importance is attached to the conservation policies and measures.

c. The laws that will be used to support the various measures, such as the environmental quality standards, cannot be implemented in an efficient manner. Moreover, each of the units concerned has its own regulations. For this reason, the various laws and powers such be under just one unit in order to bring about unity. This way, the unit will be able to formulate clear policies, plans and lines that do no overlap.

d. The programs for managing the resources and environment lack sufficient funds, and they have not been prioritized in accord with the country's policies and plans.

e. Today, implementing the plans and having the people participate in formulating natural resource and environmental management plans at the provincial level by relying on the administrative system of the rural development organizations is just the beginning. Moreover, the natural resources overlap in terms of both use and conservation.

Thus, it is essential to stipulate forms, steps, and methods of coordination and cooperation between the state, the private sector, and the people in the localities in order to implement the plans in an efficient manner everywhere.

According to the Seventh Economic and Social Development Plan, Improve the Development Apparatus and Environmental Management

1. The principle of "those who create pollution must be the ones who clean up the pollution" must be implemented during the time of the Seventh Development Plan
   - 1.1. A pollution clean-up fee must be collected in the form of a pollution tax, fee, or service charge depending on the activities and products causing the pollution. The money collected must go into a fund that will be used in managing the environment.
   - 1.2. An environmental fund must be established. The government must provide initial financial support when the fund is first established. And during the initial period, a state organization must manage things until a fund law is promulgated and an independent organization is established to handle this.
   - 1.3. Environmental protection activities must be prioritized, funds must be mobilized on the securities market, and the financial institutions must be encouraged to establish funds in order to get people to invest in environmental activities or programs.
2. Improve organization, the laws, and management by:
   - 2.1. Formulating and coordinating urban environmental development plans in a systematic manner in conjunction with clearly stipulating the role of Bangkok, the provinces, and the local administrative organizations. Also, the private sector must play a role.
   - 2.2. Improving the organizations that are responsible for overseeing the policies and coordinating the work in Bangkok and in the localities. National and provincial-level (in Bangkok and its environs and in each province) environmental restoration and development organizations must be organized. These will be responsible for overseeing the policies and coordinating things with the units concerned with environmental matters.
   - 2.3. Stipulating that the construction of infrastructural projects that affect the environment must have systems to protect the environment. The cost of these project plans must be included in cost of the project.
   - 2.4. Having the government support investments in building a waste water and garbage disposal system for all or some of the localities. This

includes obtaining land and purchasing equipment, tools, and vehicles used in controlling and reducing pollution.

2.5. Increasing the role of the localities so that they can take resolute action in managing the pollution control system in the locality. They can do this by having their own operations unit or hiring private individuals to do the work. The localities must be allowed to collect service fees in various ways as appropriate.

2.6. Establishing a joint organization composed of people from the community, businesses, and the public sector to monitor, control, and maintain the quality of the environment in accord with the standards stipulated, particularly in the urban and industrial zones and tourist spots.

2.7. Developing the manpower and technology needed to reduce and control pollution. Steps must be taken to produce tertiary level graduates in the fields of engineering, public health, environmental engineering, and environmental science, with the emphasis being on pollution, and technicians with vocational diplomas, technical vocational certificates, and high-level vocational diplomas in fields having to do with pollution control so that they can monitor the work of the various waste water disposal systems. Besides this, pollution control technology must be studied and transferred in order to design, build, and produce waste treatment equipment.

2.8. Revising the 1975 National Environmental Protection Act so that this covers all aspects of protecting and managing the environment, including the establishment of an environmental fund, and so that this can be implemented efficiently.

2.9. Promoting public relations activities, providing education, disseminating information about pollution to people at all levels, and striving to get people to cooperate in solving these problems.

Foreign Minister on Logging Concessions in Burma

BK0511150391 Bangkok Radio Thailand Network in Thai 1200 GMT 5 Nov 91

[Text] At Government House today, Foreign Minister Asa Sarasin answered questions from reporters about Thai logging concessions in Burma. He said it has to do with the Burmese Government granting logging concessions to Thai businessmen. As far as he knew, the concessions totaled hundreds of millions of rai [2.5 rai equal one acre], but only about two million rai have been operated on so far by joint ventures of Thai and Burmese businessmen which resulted from their own private contacts. The Thai Government had no involvement. It is legitimate for Thai businessmen to seek logging concessions in Burma. Thailand practices free trade and the private sector can conduct trade anywhere it pleases. The government cannot order the private sector to do or not to do something.

Regarding relations with Burma, the foreign minister reiterated that normal relations remain as before because the Foreign Ministry, which is the agency concerned, is well aware of the issue involved.

Driftnet Fishermen Complain of Lack of Buyers

BK0611014591 Bangkok THE NATION in English 6 Nov 91 p B12

[Text] Fishermen using driftnet are perturbed that canned seafood processors have stopped buying fish from them on the ground that the United States, the European Community, and the United Nations have imposed ban on driftnet fishing.

A 13-member team from the driftnet fishing associations of the Central, South and the East yesterday met Plotprasop Surasawadi, director general of the Fisheries Department, and told him their problems.

According to the United Nations' resolution, "large" driftnet fishing will be banned as of June 30, 1992.

In a letter to Plotprasop, the fishermen said canned seafood processors had stopped buying from them, advancing the argument that driftnet-gathered fish would not find foreign buyers.

They said the U.S. government had endorsed environmentalists' view that driftnet fishing also destroyed dolphins and sea turtles.

As a result, the fishermen said they had to sell their catch to fishmeal factories, earning only Bt [Thai baht) 3.5 per kg against the usual Bt16-18 per kg. If the situation persisted, all 500 driftnet boats would have to quit, unable to shoulder heavy losses. About 200 vessels had already stopped operations.

Suyot Malamas, president of the Driftnet Fishing Association of the Central Region, said seafood processors stopped buying from members of his association about two weeks ago, inflicting on them a loss of Bt50 million, or Bt100,000 per fishing trip.

The association was prepared to show that its members did not destroy dolphins and sea turtles, as Thai driftnet vessels were small, and driftnet were no longer than two km and no deeper than eight metres. The size of the boats, besides, was not over 40 gross tonnes.

He said U.S. regulation allowed vessels with driftnet length of up to 2.5 km and depth of 200-300 metres.

"The move by environmentalists to stop producers from buying fish from the driftnet fishermen is creating misfortune for our people," Suyot said.

Plotprasop said his department would study the United States and the UN laws further. He said the UN barred

fishing in areas with significant dolphin populations, while the U.S. law banned all driftnet fishing.

He said Earth Island Institute, a U.S. conservation group, had given incorrect information on the Thai fishing industry to the U.S. government. He said Earth Island Institute would be invited to see how Thai fishermen haul in fish. The Thai side would also explain the situation to the United States.

The director general said he would call a meeting with the Commerce Ministry, the Thai Food Processors Association, fishermen, and canning plants for talks on how to resolve the immediate problem.

When he contacted the Thai Food Processors Association on the allegation, he had been told that canned food processors had slowed down buying from driftnet fishermen but they had not tried to squeeze prices. The processors said they still had large stocks and were not facing any problems but that small-time fishermen had panicked when they learned about the U.S. law.

Plotprasop said the Fisheries Department was also planning to come out with a regulation to protect dolphins, to show to the United States the environmental concern of the Thai side.

Further, he said it was reported that prices of fish had declined partly because of the dispute with the EC which is trying to terminate tariff preference for the importation of Thai canned tuna.

Commerce Official Warns of Increasing Trade Pressure Over Environmental Issues

BK2810015991 Bangkok BANGKOK POST in English 28 Oct 91 p 30

[Text] Thailand is likely to face pressure from its trading partners over environmental issues in the next five years, according to Commerce Ministry permanent secretary Phatchara Itsarasena.

Mr. Phatchara told a seminar on protectionism at the Imperial Hotel last week that more trade barriers were being imposed by leading industrialised nations, including the United States, as the environment movement gained political power.

Some countries were also trying to use environmental issues as an excuse to impose barriers to imports from other countries on the grounds that they did not protect their natural resources or environment adequately, he said.

Thailand should prepare to face the threat by improving its environmental protection policies.

At the same time, it should closely monitor environment movements in leading industrialised countries to help tackle the problem before it became a serious threat to Thai exports, he said.

The "dolphin-safe" campaign in the United States, which boycotted tuna products from countries where dolphins were trapped and killed by fishing fleets as they netted tuna, was a strong indication of which direction industrialised nations were taking.

There were several similar movements in the United States which could potentially hurt Thai exports, he said. There were presently more than 100 pieces of environmental legislation pending approval by the U.S. Congress.

The U.S. Government had told ASEAN economic ministers at their meeting in Kuala Lumpur last month that pressure from conservation groups in the United States would force the Bush Administration to take tough measures in the area over the next five years.

In a related development, environmental issues were likely to be a major topic in the up-coming General Agreement on Tariffs and Trade talks, even after the Uruguay Round was concluded this year.

Mr. Phatchara said the United Nations-sponsored Earth Summit in Brazil in June 1992, which was designed to organise a common stance on environmental issues for many countries, could also make exports of some Thai products difficult.

Because Thailand did not protect its natural resources properly, it had become a target for countries using environmental issues to protect their own markets, he said.

Some industrialised countries had complained about Thailand's failure to protect its mangrove forests and accused it of using too many pesticides to boost productivity, which could lead to high levels of pesticide residues in some products.

Thai Food Processing association representative Mongkhon Saraniyatham urged all industries which may be affected by environmental legislation in other countries to closely monitor the situation and ask the Government to conserve national resources.

VIETNAM

UN Program Accelerates Afforestation of 5 Northern Provinces

BK2110152991 Hanoi VNA in English 1403 GMT 21 Oct 91

[Text] Hanoi VNA October 21—The World Food Programme (W.F.P) became widely known among the Vietnamese as one of the influential United Nations agencies operating within the country when it helped Vietnam launch a nationwide campaign to plant trees two years ago.

Under the project, coded WFP 3352, more than 45,000 hectares of bare hills and depleted forest land in five northern provinces have been covered with eucalyptus,

acacia, pine and other evergreen timber species. In addition, some 30,000 hectares of newly-planted forests have been (word indistinct) and 138 km of forest road and five of fire-break trenches have been built on schedule.

With sufficient W.F.P financial and technical assistance the rate of regeneration has acceleratad tenfold as compared with the period prior to 1989. As well, the proportion of forest growth rated as good has climbed to 60 percent from the approximately 40 percent record previously. This is mostly thanks to a new mode of intensive farming and integrated planting of different kinds of trees, and obligatory criterion provided for in the WFP 3352 project.

This success can be partly attributed to a new mode of allocating forest plots to individual farmers first introduced by the Vietnamese Government three years ago. Under the new system a leaseholder is entitled to bequeath to his children his assigned lots and to receive information on new techniques and food assistance provided for under the project. Moreover, the leaseholder is entitled to earn two thirds of the proceeds from his lot.

No less important in this successful afforestation campaign has been assistance from Australia, which has so far provided Vietnamese planters with 2,666 kilogrammes of eucalyptus, acacia and pine seeds and other materials.

Swedish Organization To Assist Vinh Phu Province With Afforestation Program

BK0311150391 Hanoi VNA in English 1414 GMT 3 Nov 91

[Text] Hanoi VNA November 3—With aid worth 8 million kronor (1.5 million US dollars) and technical assistance from the Swedish International Development Authority (SIDA), the northern province of Vinh Phu has so far this year afforested 21,000 hectares out of its total of 75,000 hectares of bare hills.

Vinh Phu province and SIDA have agreed upon a cooperation program for the period 1991-96, under which SIDA will assist Vinh Phu to plant 5,000 hectares of forests and 6 million scattered trees annually to feed the Swedish-built Bai Bang Paper Mill in the province.

Recently, a number of training courses on economic management and farming techniques were organized in the province with help from Swedish lecturers.

BULGARIA

Licence Issued for Import of Waste for Projected Recycling Plant

AU2310115191 Sofia BTA in English 1115 GMT 23 Oct

[Text] Sofia, October 23 (BTA)—Mr. Dimitur Vodenicharov, minister of the environment, signed, though with a minute of dissent, a document licensing the import of 100 million tons of waste for recycling at a Bulgarian plant which will be built in this country, the press informs. However, not a single ship has or will head for the Bulgarian port if it is loaded with radioactive waste or chemicals of unknown origin, Ministry of the Environment experts said at a press conference yesterday.

The U.S. Principum Trust Limited has suggested to build a recycling installation with a capacity of 10 million tons per year near the town of Burgas (on the Black Sea coast). Under this project Bulgaria will receive a 360 million dollar interest-free credit. Moreover, some 2,150 new jobs will be opened in an area where more and more mines are being shut down and the number of unemployed miners is rising, "PODKREPA" writes.

The minister of the environment will withdraw his signature from the licensing document if no reliable project is presented, "SVOBODEN NAROD" says. There are many unclear points in the project offered by the PTL group, such as the transportation of waste and the control of its chemical composition. It is unknown what will happen to the remainder after recycling—30 percent of the initially fed quantity. The project was severely criticized by the environmentalists from the town of Burgas.

Ecoglasnost Protests Against Burgas Waste Recycling Plant

AU2710191591 Sofia BTA in English 1823 GMT 27 Oct 91

[Text] Sofia, October 27 (BTA)—The Ecoglasnost Political Club circulated a declaration in connection with the project for the construction of a plant for the recycling of imported waste near the Black Sea town of Burgas. Ecoglasnost calls on the government to make public every piece of information concerning the project and insists that it should be carefully studied by Bulgarian and foreign experts. Ecoglasnost calls on the citizens of Burgas and the region to protest against this "ill-considered project which lowers national dignity."

An international protest rock festival called "Rescue Ruse" will be held for the first time in Bulgaria on November 7, 1991. It will go on for 12 hours at the Bulgarian-Romanian border post near the town of Ruse (on the Danube). The festival will be attended by rock singers and groups from Bulgaria and by guests from Europe, the United States and Canada.

The purpose of the rock festival is to draw the attention of the international community to the plight of the city which has been continually polluted from the Chemical Works in the Romanian town of Giurgiu. The participants in the festival will issue an appeal to the international organizations to intervene and suspend the operation of the Giurgiu plant until it is brought in line with international environmental protection standards.

Tens of thousands of leva have already been donated by Bulgarian organizations and enterprises to the Rescue Ruse Fund. The money will be used for the treatment of children affected by the pollution.

CZECHOSLOVAKIA

Skoda Pilsen To Produce Electric Car for Swiss Market

91WS0534X Paris AFP SCIENCES in French 22 Aug 91 p 35

[Unsigned report: "An Electric Skoda Favorit for Switzerland"]

[Text] Prague—Work will soon begin in Czechoslovakia on production of an electric car destined for the Swiss market. The manufacturers of the car, which is modeled on the "Skoda Favorit," will benefit from the know-how of the Swiss firm Fridez Solar AG.

Skoda Pilsen's subsidiary in Ejpovice (West Bohemia) will produce the first series of about 100 electric Favorits before the end of the year. The cars will be marketed in Switzerland, along with another 1,000 scheduled for production in 1992, according to Mr. Karel Kleinmond, manager of the Ejpovice factory.

The automotive bodies and other mechanical parts for the electric Favorits are provided by the Skoda automobile factory at Mlada Boleslav (50 km northeast of Prague). The 12-kilowatt electromotors as well as the electronic control systems will come from various Western countries, including Switzerland, the manager said.

The electric Favorit is a two-door sedan, 3.8 meters long, with enough room inside to seat five; it can reach a speed of 80 km per hour and can go about 100 km without a recharge. Planned offerings for 1992 include a more powerful model to be equipped with a new Czechoslovak electromotor, and a two-seater pick-up truck version with extended wheel base.

BRAZIL

Government Report Reflects Environmental Views for Rio-92

[Article by Lucia Toribio]
92SM0048Z Rio de Janeiro 0 GLOBO 28 Sep 91 p 24

[Text] Brasilia—The Brazil that will be introduced to the international community via the report prepared for the United Nations Conference on the Environment and Development (Rio-92) is a poor country, physically deteriorated, that has suffered the environmental impacts of the development policy available to the Third World.

According to the document, released on Wednesday, Brazil faces not only situations of environmental degradation associated with "excess" development (pollution and waste of resources), but situations described as an "absence" of development, or perverse development (poverty and socioeconomic inequality).

But the national X-ray, which does not hesitate to criticize the developmentalist option followed by this country or to point out its devastating effects on the environment, places the Brazilian reality within a worldwide context, where it identifies "the exhaustion of a development style that proved to be ecologically predatory, socially perverse, and politically unjust."

Rather than sitting down in the prisoners' dock and acknowledging its sins, Brazil reaffirms that it is unwilling to compromise its economic growth process for the sake of maintaining a healthier world environment, and asks the countries of the First World to accept their own responsibilities.

"Although both the government and society bear responsibilities for the existence of serious environmental problems, there is a consensus that the industrialized nations are primarily responsible for the gravity of the problems found on a worldwide scale. It is, then, natural to suppose that the developed world would promote and finance the cleanup of the Planet," the document reads.

The Brazilian government takes advantage of the report to refute ideas and proposals that have arisen in international fora and will certainly gain adherents in the debates during the U.N. Conference on the Environment. This is the case, for example, of the interpretation that the natural resources are "assets of humanity" and should be under the guardianship of the world's nations as a group.

Brazil's reaction, expressed in the report, is: "It would be unreal to suggest that certain resources belong to humanity as a whole, when in fact they are located within national jurisdictions. If it were true that they should be shared in a sort of "world fund," it would be no less correct to suggest that economic, political, and technological power should also be shared by all the nations of the world."

Brazil acknowledges that globalization of the environmental problems dictates a revision of traditional concepts of "national sovereignty" and "strategic security." But that revision should not give credence to what the document terms the "ingenuous perception." The Government also refutes the theory that justifies implementation of population control in the countries of the Third World on the grounds of exhaustion of their natural resources.

The report calls that position "irresponsible and morally censurable," and cites the true situation in the developed countries: environmental pollution in the leading industrialized countries has risen at rates infinitely higher than the growth rates of their populations."

The document, prepared by the Brazilian government and released last Wednesday, will be reviewed by the Interministerial Council on the Environment (CIMA) on 9 October.

Social Inequality Aggravates Problem

"The concentration of land ownership, inequality, and absence of social mobility in rural society are phenomena that are at the root of the economic, social, and environmental problems of Brazil." Starting from that premise, Brazil's report for Rio-92 identifies in the development model adopted by this country the principal causes of the deterioration of the Brazilian environment.

In agricultural and industrial production, and in mining, the Brazilian economy has been characterized in recent decades by priority attention to the foreign market. Export incentives, intended to generate foreign exchange with which to pay off the external debt, were the factors responsible for the proliferation of crops produced for the world market—such as soybeans, coffee, oranges, and sugar cane.

Increased output of those crops left a trail of destruction, characterized by loss of forest cover (in Parana, for example, 70 percent of the forests have been lost in 40 years), pollution by chemical fertilizers, and by the erosion of farm land. Industrial expansion, according to the report, followed patterns of concentration in areas that now face environmental problems of alarming dimensions.

The document cites as examples the industrial complex at Cubatao (erected on a site where the soil is unsuited to the dispersion of pollutants); the Camacari Petrochemical Complex [Bahia State] (where, despite technological advances, environmental problems still exist because of the high permeability of the soil there); and the Grande Carajas Program (which is helping to accelerate the pace of deforestation in that region).

The report does not, however, mention the Calha Norte Program and the Vale do Rio Doce Company which, in the initial version of the document, were blamed for the extermination of several Indian groups in the Amazon region, especially the Yanomami.

Latin American Front To Be Proposed

The report that Brazil will send to the United Nations in mid October gives an advance indication of the position this country will take at Rio-92. Brazilian negotiators will suggest that Latin American countries start working as a bloc. The document advocates "new forms of cooperation and coordination among the countries of the region," to counterbalance the coordinated action of the developed countries as they defend their interests.

Brazil puts part of the blame for the failure in the negotiations of Latin American foreign debt on the individualization of creditors and debtors that "buried the basis for a multilateral negotiations." That mistake, the report argues, should not be repeated in negotiations on environmental questions.

Acting as a bloc, the developing countries should use the conference to ensure the transfer of technology and a resumption of the flow of credit. Without that resumption, the Third World will be unable to carry out any environmental plan or launch any effort to implant alternative means of achieving sustained development.

Launch of First Brazilian Environment Satellite Set for May 1992

PY2610235491 Rio de Janeiro O GLOBO in Portuguese 24 Oct 91 p 30

[Text] The first Brazilian satellite, which is being manufactured by the National Institute of Space Research (INPE) and which will cover the entire national territory, will be put into orbit before the Rio-92 [UN Conference on Environment and Development] ecological conference, which is scheduled to start in June next year. The U.S. company Orbital Sciences Corporation, whose agent in Brazil is Montemer International of the Monteiro Aranha Group, won the bidding contest organized by the Aeronautics Ministry and will be launching the satellite for $11.5 million.

The satellite, which has been named SCD-1 and which will stay in elliptical orbit at an altitude of 700 km, will conduct remote sensoring and will transmit environmental data on Brazilian soil gathered through a network of 500 Automatic Data Collection Platforms (PCD). This system is equipped with sensors that can be used in meteorology, oceanography, and atmospheric chemistry. The SCD-1 also will monitor conditions in the Amazon basin and adjacent rain forests. It will measure both the soil temperature and forest degradation.

Jacques Mercier, a partner-director of Montemer International, said that the idea is to launch the satellite in May 1992 so that it can be in operation during the Rio-92 conference, which will be attended by several chiefs of state and which will focus on global environmental issues. He added that the SCD-1 will be launched from the United States by a B-52 plane that, upon reaching a 10,000-meter altitude, will release a Pegasus rocket that will put the satellite into orbit. He noted that the cost for launching the satellite includes insurance and financing over a two-year period.

Joint Research Project With USSR on Ozone

92SM0049Y Rio de Janeiro O GLOBO in Portuguese 27 Oct 91 p 18

[Text] Sao Paulo—Soviet scientists will arrive in Brazil next week to study the magnetic anomaly in the South Atlantic that is located 400 km off the Brazilian coast at the latitude of the state of Sao Paulo. Satellites of the USSR's space program have discovered that this anomaly is causing a hole in the ozone layer, permitting the entry of ultraviolet rays from the sun.

Scientists from the Lebedev Institute of Physics, the Polar Institute [as published] of Geophysics, and Moscow University—in cooperation with the Julio de Mesquita Filho Institute of Meteorological Research of Sao Paulo State University (UNESP) in Bauru—will launch four stratospheric balloons carrying equipment designed to measure the intensity of the rays that reach the earth.

The project coordinator, Andre Ngan Bui Van, a naturalized French citizen of Vietnamese extraction who works at UNESP, said that the data collected by the equipment—which will attain an altitude of 15,000 meters—will be received via radio and analyzed at the Institute of Meteorological Research and Institute of Physics of UNESP.

This research will cost the Soviets and Brazilians approximately $1 million. According to Bui Van, the detectors of cosmic rays will for the first time establish with precision the extent of the destruction of the ozone layer at a location 400 km off the Brazilian coast.

"These rays can cause skin cancer and even blindness, depending on their intensity," he said.

CHILE

Details of Prospective Environmental Agreement With U.S.

PY2610143891 Santiago Radio Nacional de Chile Network in Spanish 1000 GMT 26 Oct 91

[Text] An important agreement related to the preservation of the environment may be signed by the United States and Chile by the end of this year.

The program, which falls within the framework of the Americas Initiative proposed by President George Bush,

foresees the creation of a fund earmarked to solve specific environmental problems such as the contamination of Chilean waters.

In order to establish grounds for the agreement, official Chilean and U.S. representatives held their third and last meeting at the Finance Ministry.

Chilean delegation chief Rafael Asenjo explained that the resources for the fund will come from the interest on the official Chilean foreign debt, which will be forgiven for this specific purpose.

It should be recalled that the Chilean debt interest amounts to $23 million and is due in 1995.

Asenjo explained that this fund will be used in various areas.

[Begin recording] [Asenjo] These funds will be used to treat water, for activities related to natural areas, and for environmental education programs. In general terms, it is a broad program of activities linked to the preservation of the environment.

[Unidentified journalist] [question indistinct]

[Asenjo] No, the problem of the ozone layer and overall environmental problems are not included. This fund's main objective is to tackle specific problems at a regional, district level in order to solve specific and concrete environmental problems. This agreement does not take into account overall problems, due to the amount of money and number of people involved. [end recording]

Rafael Asenjo noted that with these negotiations, Chile is one of the first countries to materialize with concrete initiatives President Bush's Plan for the Americas in the environmental field, through the fund that will be administered by the two governments.

REGIONAL AFFAIRS

Regional Analysis of Water Shortage Issues

92WN0057A London AL-SHARQ AL-AWSAT in Arabic 16 Oct 91 p 6

[Article by 'Ali Ibrahim: 'Water Wars Future Fact Unless Regional Agreements Are Reached']

[Text] **('Ali Ibrahim writes about the Middle East's water problem, its relation to ongoing arrangements for peace talks in the region, and the postponement of the 22-country conference that was scheduled to be held in Turkey on the future of water in the Middle East. He monitors several aspects of a problem that poses a future threat to the peoples of the region.)**

Water wars in the Middle East are a future fact that international research centers and strategy experts predict, as long as the tension that has begun to rise among the region's countries over this important resource is not alleviated now through regional cooperation for joint exploitation of available common water resources.

The postponement of the Turkish-sponsored regional conference on water in the Middle East that was scheduled to be held next month reflects the extent to which this vital issue is linked to political arrangements and conditions in the region. The explanation offered for the postponement was the desire not to create interference with American efforts to hold a Middle East peace conference at the end of the month. The behind-the-scenes explanation was that Syria had refused to participate in the conference if Israel participated. American press reports said that Syria was refusing to promise to enter the third phase of the regional peace talks, involving regional arrangements about water, unless Israel promised to withdraw from the Golan Heights.

Even before the postponement, much controversy accompanied reports of preparations for the conference in Turkey, amid uncertainty about the topics that would be raised for discussion. The single clear topic was a Turkish-promoted scheme for which economic feasibility studies have been prepared. It has been nicknamed "Pipes for Peace"—a clear sign of the connection between the water problem and political arrangements in the Middle East.

The project calls for laying pipelines costing between $20 billion and $30 billion to deliver surplus water from the rivers of Turkey to the Arab countries, especially the Gulf states, across Syria and Jordan. Turkey has promoted the idea for years and has proposed it to the Gulf states. Arab institutions have helped fund feasibility studies. However, the high cost and political perils of relying on a water source not controlled by the receiving countries, plus the problem of Israel's presence in the heart of the region adjoining the pipeline, have thus far made implementation of the idea impractical.

Reports have leaked out about a scheme that Israel has proposed to the European Community to solve the Middle East's water problem in the context of comprehensive arrangements in the postpeace phase. It involves using surplus water from the Litani River and the water of the Yarmuk River, in addition to diverting 1 percent of the Nile's water to the Gaza Strip and the Negev after implementing joint projects to increase the flow of Nile water to Egypt by 25 percent. This would be done by draining marshes to reduce evaporation. This is a revival of an old idea that was raised during the Egyptian-Israeli peace talks and that met with opposition from Cairo. It is not expected to gain acceptance, especially since Egypt itself faces a future threat of inadequate water coming from the heart of Africa up the Nile.

Amid the political disagreements and divergent interests, a basic fact stands out: The peoples of the region are threatened with a severe water crisis in the future, one that could lead to wars between rival parties sharing the limited resources. Egypt's defense minister bluntly hinted several weeks ago that his country was prepared to use military deterrence if it felt that its flow of Nile water was threatened.

The Middle East's water problem is divided into a number of fronts, or axes. The most critical of them is the one on which Jordan, Lebanon, and Syria mesh with Israel, especially because the water problem has begun to be severe in the West Bank, Jordan, and Israel. Next, water is tied to Turkey, which controls the sources of the Tigris and Euphrates rivers. Then, there is the problem of Egypt's increasing water needs and talk about proposed dams in certain African countries, particularly Ethiopia, that share in the Nile. On the periphery, there are the increasing water needs in the Gulf, although these do not represent an immediate problem because of desalination plant projects. Finally, there is Libya's man-made river project, with conflicting reports emerging about its effect on ground water in Egypt and Sudan.

Despite the importance of the problem, there are still no internationally-recognized regional agreements between all parties, or even serious negotiations. One exception is Egypt's effort to sign an agreement among the eight countries that share the Nile River, despite the reservations of a crucial party, Ethiopia.

The region's most explosive water problem is the one at whose heart Israel stands with Jordan, Lebanon, and Syria, particularly since the state of war officially continues and no agreements exist. Still clearly remembered are Israel's operations to seize Arab water resources by a logic of force and to divert the Jordan River—this elicited the holding of the first Arab summit.

Israel, which is trying to attract millions of Soviet immigrants, is well aware that the existing water resources under its control are inadequate for such tremendous numbers. Therefore, it is the party most interested in derailing any current peace arrangements

until it can impose a new *fait accompli* that increases its water resources—naturally, at the expense of the water resources of the Arab countries. This problem could be a central issue in any coming peace talks. Jordan, in particular, faces a water shortage, as shown by measures to ration water use during the summer.

As for relations between Turkey, which controls the sources of the Euphrates and Tigris, and Syria and Iraq, the few meetings that have been held between the three parties to try to agree on a permanent formula for water flow from Turkey have made no progress. Although Turkey denies that it might use water as a political weapon, unilateral measures to decrease the flow while a lake forms behind the Ataturk Dam Project have shown the dangers facing Syria and Iraq because of their lack of control over water sources. Furthermore, the balance of power does not favor the two countries. A large population increase will cause Syria to face a 2-billion-cubic-meter annual water deficit by the year 2000. Turkey, for its part, says that there is a great waste of water in the two countries.

The equation is different in Egypt. Although Egypt is the last party to receive Nile water, it controls this resource because of many factors. These include the balance of power and a long history of exploiting the river, inasmuch as agriculture in Egypt is absolutely dependent on irrigation, and the Nile represents 90 percent of Egypt's water usage.

However, with a population that will reach 75 million at the beginning of the next century, Egypt requires additional water resources. It greatly supported the Jonglei Canal Project in the Sudan to increase its share of water, but disturbances in the Sudanese south halted the project, which still remains in abeyance.

On the other hand, there is a threat from projected dams in Ethiopia, the source of the Blue Nile. The threat still remains in the realm of possibility, but that does not invalidate the need to reach an agreement among the nations bordering the Nile, countries that may need dams for electrical power. There are still problems of rationalizing use, reducing excess use, and controlling population growth.

In the Gulf region, the problem involves balancing economic benefit and political factors in providing water by building desalination plants, or through the Turkish water pipeline project.

As for Libya, there are conflicting reports about the effect of the man-made river on the ground-water reservoir in Egypt and Sudan, although it is clear that the Egyptian Government is not worried about it. In any case, it is difficult to imagine that any severe crises will erupt between Arab parties over water, unlike what could happen between Arab and non-Arab parties that share a single water resource.

There seems to be no alternative to reaching arrangements to regulate water relations in the region. This calls for a single clear idea among the Arab parties, so that their negotiators will be strong and able to carry out the interests of its people.

Arab League Secretary on Middle East Peace, Water Problem

NC2310225591 Cairo MENA in Arabic 2215 GMT 23 Oct 91

[Text] Cairo, 23 Oct (MENA)—Arab League Secretary General Dr. 'Ismat 'Abd-al-Majid has reiterated that (a durable and just peace) in the Middle East must be based on the principle of exchanging land for peace and on UN Resolutions 242 and 338, because they represent the international legitimacy which calls for recognizing the Palestinian people's rights, including their right to sovereignty over their homeland.

He said Israel immediately must begin to halt the building of settlements in the occupied Arab territories as a goodwill gesture toward the peace conference. He asked: Otherwise, over what will it negotiate?

In an interview with AL-MUSAWWAR to be published in Friday's edition, he emphasized that East Jerusalem, as is the case with other occupied Arab territories, should be subject to negotiations, because Jerusalem concerns all heavenly religions.

He stressed the need to support the Lebanese Government in its effort to extend its full authority over all the Lebanese territories and to work toward implementing Security Council Resolution 425, which calls for Israel's withdrawal from Lebanese territories.

He noted that the Middle East region will face a new challenge, the water challenge. He said there are certain powers whose primary concern is to seize Arab water sources to serve their own goals at the expense of pan-Arab water security. He warned against attempting to seize Arab water sources, saying this is a flagrant challenge to the current regional peace efforts and could turn the region once more into a hotbed of conflict over water resources.

He pointed out that the call by some non-Arab countries for some type of cooperation on rationing and providing water to the region's countries merely is commercial in nature and does not consider security and national dimensions.

'Abd-al-Majid noted that the water issue is a vital one which needs a defined future Arab strategy. He referred to his call for holding an Arab water conference of concerned countries through the Arab League.

INDIA

Plan To Prevent Pollution of Cauvery Basin Presented

92WP0045A Madras INDIAN EXPRESS in English 17 Sep 91 p 2

[Text] EXPRESS NEWS SERVICE, Madras, Sept. 16—To prevent pollution of the Cauvery the Tamil Nadu [TN] government has drawn up a Rs 231 crore action plan on the lines of the Ganga Action Plan.

Tabling the policy note on environment control in the Assembly, on Monday, Health Minister S. Muthuswamy said a preliminary project report on the environmental improvement plan for the Cauvery basin had been prepared by the TN Pollution Control Board.

The discharge of sewage from 35 towns on the banks of the river, and effluents from 1,139 industries, were posing a potential threat to its waters.

The salient features of the project were proper treatment and disposal of waste water into the river and its tributaries from local bodies, and provision of suitable treatment methods. The project proposals would be forwarded to the Centre for full assistance, he said.

The government was concerned about the pollution level in the stagnant waterways of Madras—Adyar, Cooum and the Buckingham Canal—reaching immense proportions. Consultants from the UK—The Severn Trent International—given the task of surveying the entire area, had submitted an interim report. The report said 80 p.c. of the pollution was caused by raw and partially treated sewage flowing into these waterways. The MMWSS had taken up interim work as recommended by the consultants. It was expected, too, that pollution from this source would be checked by December 1991.

Besides this, a high-level ministerial committee and a task force, headed by the Chief Minister and the Chief Secretary respectively, had been constituted. Action had also been initiated to prevent the let out of pollutants directly into the waterways by public buildings.

Simultaneous action had also been taken to initiate dredging in the waterways in consultation with the Overseas Development Administration, to remove the muck and silt deposited over the years, he added.

To ensure that the Manali area, a major industrial complex with large chemical, petrochemical and petroleum industries, was not over-exploited, a Rs. 30 lakh sustainability study would be carried out by the Salim Ali School of Ecology, Pondicherry Central University, according to the policy note.

Keeping in mind the Bhopal disaster, the TN government had taken a series of steps for management of hazardous substances. To evolve a suitable management structure for this task and to prevent chemical disasters, the government had constituted a state-level coordination committee with the Chief Secretary as the chairman and with District Collectors heading district emergency committees.

As the Manali region posed a potential risk to the industrial employees as well as the community, it was proposed to set up an emergency response centre in the TN Pollution Control Board at a cost of Rs.58.44 lakh. The objective was to provide hazardous information services to accident sites.

Nearly 50 industrial units all over the state, involved in the manufacture/processing of hazardous substances, had been identified and asked to prepare off-site/on-site emergency preparedness plans. Thirty-five units had already prepared such plans, the Health Minister said.

Replying to the discussion, Mr. Muthuswamy said the laboratory in Madras set up by the TN Pollution Control Board was being used by neighbouring states and two more labs were being set up at Tuticorin and Hosur at a cost of Rs. 20 crore.

World Bank Grants Loan for Pollution Control

92WP0044A Bombay THE TIMES OF INDIA in English 27 Sep 91 p 3

[Text] Bombay, Sept. 26—The Indian government entered into an agreement with the World Bank on July 8 for a line of credit of $155.6 million to boost efforts to control and monitor industrial pollution in the country. Mr. U.K. Mukhopadhyay, secretary, environmental and energy, Maharashira government, told a seminar here today.

He said the state government had undertaken a project on the assessment and management of health and environmental risk from the industrial complex, initiated by international organisations like the UNEP (United National Environmental Programme), WHO (World Health Organisation) and the IAE (International Atomic Energy). The project was jointly sponsored by the Maharashira Pollution Control Board, department of energy, under the guidance of Dr. R.K. Garg and the BARC [Bhabha Atomic Research Center], said Mr. Mukhopadhyay.

The project aimed developing methodology approaches to risk assessment and management in the Thane-Belapur industrial estate, where nearly one-third of the industrial population resided, he said.

The national seminar was organised by the Centre for Environmental and Management Studies and the director, Industrial Safety and Health, to review the occupational health and safety of the industrial environment.

Environment would be the one single issue of the 1990's, said Mr. Mukhopadhyay, in his keynote address. He said that government of Maharashira had taken the initiative to prepare disaster management plans for Thane, Pune,

Raigad, Ratnagiri and Bombay suburban districts, and appointed a committee to monitor the plans and ensure that coordination is actually achieved in the event of an emergency.

To contain the industrial environment, the government of India should impose a stipulation that industries should revamp their technologies, once in 20 years, and impact a fiscal benefit to them for doing so, suggested Mr. V. Ramadurai, industrialist.

Mr. Ramadurai pointed out that technology was improving so rapidly that all over the world, it was being realised that what was good 20 years back, was no longer viable today. "Unless we change our processes, we will always be looking for scapegoats to contain the environmental impact," he said.

Mr. Rohitdas Patil, state minister for labour and agriculture, inaugurated the seminar.

He commended industrialists in Maharashira for coming forward to instruct managements of various industrial units on how to rectify their drawbacks, after identifying them.

Regarding fiscal benefits to industries for changing equipments every 20 years, as proposed by Mr. Ramadurai, Mr. Patil observed that already industrialists enjoyed the benefits of showing depreciation in their balance sheets and finally, after five to six years, bringing down the value of their equipment to zero.

"However, industrialists should come forward if they want to replace obsolete machines, and require funds," he invited.

Authorities Refute Attribution of Illness to Rajasthan Nuclear Plant

92WP0042A Bombay THE SUNDAY TIMES OF INDIA in English 29 Sep 91 p 8

[Article by Ajay Bharadwaj: "Cancer Hits Rajasthan N-Plant Staff"]

[Text] Rawatbhata, Sept. 28—There has been an alarming high incidence of cancer among workers of the Rajasthan Atomic Power Project (RAPP) here, according to data collected by the Environmental Survey Laboratory (ESL).

Of the 341 deaths among workers and members of their families between 1967 and 1989, 26 were due to cancer. Three more cases of cancer were detected among those residing in the neighbouring areas.

The people here are also greatly concerned about the growing incidence of congenital deformities among babies, miscarriages, lung problems and skin diseases. Old-timers say they had seldom come across such complaints till a few years ago.

In fact, many families have fled from Tamlao and Birodia villages located near RAPP. "We are living in the shadow of death," said Gyarsi Lal, a primary school teacher. "We expected prosperity and development of the area when the project was set up, but it has now spelled doom for us," he lamented.

The RAPP authorities, however, deny any link between the afflictions of the people in the nearby villages and the radioactive discharge from the plant. They say radioactivity released through the air and water is "very low" and in keeping with the recommendations of the International Commission of Radiological Protection (ICRP).

The authorities state that the annual external radiation released within the 1.5-km belt around the project has been 5.5 milli rem (mrem) every year, which has much below the annual exposure limit of 100 mrem recommended by the ICRP.

The FSL, they say, had collected more than 2,500 samples annually to detect whether radiation exceeded the limit.

There have been times when the release of radiation has much higher than 5.5 mrem and the release of hydrogen sulphide, a toxic gas emitted from the heavy water plant, had increased by 300 percent due to technical flaws.

The villagers are not convinced by the arguments of the authorities because they feel that they are being kept in the dark about all that happens at the RAPP. Their fears are strengthened when the National Power Corporation (NPC) personnel visit their area for surveillance. "We feel cheated because they do not tell us what precautions we should take to avoid the effect of radiation even as we see our children and women falling victim to it," said Prabhu Daval, a tea-stall owner in Rawatbhata.

Environmental experts are of the opinion that a scientific institution should be engaged to study the impact of radiation in the area. A recent study conducted by a team of doctors from the Udaipur medical college had proved to be a futile exercise since it was difficult for the doctors to establish a link between radiation and how it affected the people.

Similarly, a voluntary body, headed by Mr. Sanghamitra Desai from Gujarat, and Dr. Surendra Gadekar, a nuclear expert, carried out a survey in the area to identify the impact of radiation on flora and fauna. "Such data collection is a vain effort unless the team is equipped with sophisticated technical expertise, because at times the effect is perceptible after exposure to radiation over a long period," said an environmental expert.

Even as the controversy over the radiation from units one and two continues, the RAPP authorities are planning to set up six more units here. The third and fourth units, each with a generation capacity of 235 mw, are under construction. The Centre has cleared four other

units with a capacity of 500 mw each. The state government has also okayed the expansion plans without conducting any study about the possible impact it would have in the area. The matter assumes importance as Kota city, with a population of more than 500,000 is hardly 50 km from the site.

While both the Central and state governments cleared the expansion of the project early this year, the RAPP authorities did not seek clearance from the state environment department for setting up units three and four which are almost half complete.

While approving the setting up of four units this year, the state government laid down 47 conditions to protect the environment in the area. It is learnt that the RAPP authorities have shelved these suggestions much to the discomfiture of the environmental department. One of the conditions stated that the authorities must conduct a survey in a 100-km belt around the project to study the impact of radiation. Instead, the RAPP officials carried out the study in a 20-km belt.

In view of the people's apprehension, it is felt that the RAPP officials should organise discussions and audio-visual screenings to dispel any doubts among the villagers. They should also have access to facilities provided for the RAPP staff, including the hospital and schools, so that they do not feel discriminated against. Some RAPP officials feel that much of the "propaganda" against the project has been prompted by the villagers' desire for more employment opportunities and facilities.

Government Refusal To Sign Montreal Protocol Justified

92WN0069A Bombay THE TIMES OF INDIA in English 8 Oct 91 p 12

[Unattributed article: "Third Thoughts on Treaty"]

[Text] It is as well that the Union government has decided not to sign the Montreal Protocol, which seeks to phase out chlorofluorocarbons or CFCs, which harm the ozone layer. At the London meet last year, India and China seemed to be in two minds about whether they, as leaders of developing countries, should agree to eliminate the use of CFCs by 2015—15 years after the deadline for industrial nations. The latter, thanks to their profligate consumption patterns, have caused the perforation of the ozone layer, thereby raising global temperatures. However, the redoubtable Ms. Maneka Gandhi, who resurfaced as environment minister in Mr. Chandra Shekhar's government, subsequently appeared to be ready to commit the country to the treaty, on certain conditions. Her successor, Mr. Kamal Nath, has chosen to be more circumspect and is waiting for industrial nations to be more forthcoming in parting with technology and financial aid to enable the country to switch over to CFC substitutes. As things are, they have only come up with $160 million for developing countries as a whole over three years, with another $40 million each for China and India, for this purpose. These two countries consume less than 2 percent of the world's CFCs, but will clearly need to provide much more refrigeration and air-conditioning to their citizens, not so much as a luxury but as a necessity.

The Montreal Protocol is important for another reason as well. In June next year, developed and developing nations will be expected to sign a treaty on the Greenhouse Effect at the UN environment conference in Rio de Janeiro, and this protocol will set a precedent. If developing countries are made to fall in line, if the polluters are able to get away without picking up the entire bill for the damage they have caused to the globe by burning fossil fuels and adding to the carbon dioxide levels, it will mark a significant triumph for western diplomacy, which is already setting the agenda for these crucial negotiations. In the case of CFCs, a British consultant has calculated that it will cost as much as $1 billion (before devaluation) to switch to substitute gases in India, which shows that the aid so far preferred is peanuts. What is more, the pressure by the U.S. government on this country to abide by patent laws sends a clear signal that, far from being prepared to share know-how in such fields, U.S. firms will protect their commercial interests when it comes to transfer of technology. Indeed, there are signs that some western manufacturers of halons, another ozone-depleting gas, are in fact stepping up the export of this know-how to India and other developing countries, because it is banned at home.

Court Dismisses Bhopal Petitions, Ends Controversy

BK2410085291 Delhi All India Radio Network in English 0730 GMT 24 Oct 91

[Text] The Supreme Court has finally ended the controversy over the settlement in the Bhopal gas leak disaster case by dismissing two pending petitions filed by a lawyer. According to agency, the constitution bench headed by Chief Justice Ranganath Mishra said today that the review petition challenging the $470 million settlement and the Bhopal gas leak processing of claims act were no longer sustainable in view of the court's judgement in the case early this month. On the 3d of this month, the court had upheld the validity of the settlement but quashed the immunity against criminal action granted earlier to the Union Carbide Corporation and its Indian subsidiary for causing a major industrial disaster.

IRAQ

Baghdad Water Found 'Unfit for Human Consumption'

JN2310104691 Baghdad INA in Arabic 0730 GMT 23 Oct 91

[Text] Baghdad, 23 Oct (INA)—A source at the Environment Protection Center has said that 3,032 samples of

drinking water taken from Baghdad and the governorates in the first half of this year were found to be unfit for human consumption.

The source told AL-JUMHURIYAH today that the unfit samples represent 20.4 percent [no further elaboration]. It added that 33,875 samples taken from Baghdad and the governorates contained concentrated chlorine, which included 4,937 samples, representing 14.5 percent, that do not meet internationally approved concentration standards.

Sources have attributed this to the deterioration of the environmental situation in Iraq as a result of the U.S.-Atlantic aggression that affected water plants and the drainage of heavy water and destroyed power stations. Add to this the scarcity of necessary equipment for water sterilization as a result of the economic blockade on Iraq.

The sources explained that the lack of sterilization materials and necessary equipment for the operation of projects and complexes has prompted citizens to use natural sources of water, such as rivers, streams, and canals. This has resulted in the spread of many contagious diseases, such as cholera, typhoid, viral hepatitis, and others.

Environmental Effects of War Damage to Arable Land

JN2610132591 Baghdad INA in Arabic 1127 GMT 26 Oct 91

[Text] Baghdad, 26 Oct (INA)—The U.S.-Zionist-Atlantic aggression has left dangerous environmental effects on Iraq's green areas.

A responsible source at the center for the conservation of the environment told INA that the U.S.-Zionist-Atlantic aggression against Iraq damaged 1,965,047 donums [2,500 square meters per donum] of arable land in Iraq. On the other hand, as irrigation pumping stations have fallen into disuse due to the destruction of power stations, the country's total arable land of 19,161,652 donums have been brought down by approximately 5,905,382 donums.

The source explained that among the environmental effects, green areas decreased in contrast to desertification which expanded, especially in the western areas of central and southern Iraq. He added that the land's productivity of agricultural products has dropped because of the scarcity of fertilizers and the effect of the sulfur dioxide from explosions. The dissolution of this substance in rivers and lakes has also effected the fisheries. He noted that there has been a rise in temperatures as a result of the decline in green areas, a rise in the speed of winds, and a decline in plants pollination due to rainfall.

The source urged international environmental organizations to work to lift the economic embargo imposed on Iraq and to support Iraq's efforts to tackle the grave environmental effects of the U.S.-Zionist-Atlantic aggression.

ISRAEL

Salinization Poses Threat to Coastal Aquifer

TA3010131991 Tel Aviv HA'ARETZ in Hebrew 30 Oct 91 p B2

[Report by Hayim Bi'or]

[Excerpts] The orange groves surrounding almost every Gaza Strip neighborhood appear to be wilting although the picking season is only about to begin. [passage omitted]

The declining quality of the Gaza Strip's citrus fruit is not due either to the local residents' inability to maintain the groves or to any significant drop in the groves' profitability. The reason lies in the significantly inferior quality of the agricultural water supplies. Speaking last week at a seminar convened by the Life and Environment Organization, Water Commissioner Dan Zaslavski warned that the water-bearing soil stratum (aquifer) along the coast is undergoing a ruinous process of salinization. Zaslavski added that the Gaza Strip's aquifer, where the rate of salinization is faster, is close to disappearing. "Bit by bit, the Strip will be totally unable to use irrigation. They will be hardly able to supply drinking water to the growing population."

The aquifer section between Ashqelon and the Hadera district is hardly in a better state. The scarcity of rain and, mainly, the constantly increasing pumping have enhanced the process of salinization. In rainy years, the aquifer level rises and water flows out. Although the loss of water is undesirable, water flowing out toward the sea at least rinses off the layer of salts. In recent years, the opposite has occurred. As the coastal aquifer's water level dwindles, sea water moves in, penetrating the aquifer and creating a solid layer of salt upon its walls. Data issued by the water commissioner's bureau reveals that out of the 300 million cubic meters in the coastal aquifer, 60 million are so permeated with salt as to be unsuitable for agriculture or industry, to say nothing of home use.

According to the data, the past five years have seen a process in which annually, 20 of the aquifer's total 1,800 square km have become unproductive. The water commissioner's calculations further show that every cubic meter of water needlessly pumped from the coastal aquifer cause a damage of $0.75 to the economy. This sum is quite close to the production cost of desalinated water, which is estimated at $1 per cubic meter.

Just before the rain season last year, the water commissioner's bureau and Meqorot water company warned about a 2 billion cubic meter water deficit. No new data has been published since, but in view of the dry winter in

northern Israel last year and the influx of immigrants who have increased the water demand, it can be assumed that the water deficit has become even more serious.

At present, the Lake Tiberias water level is 10 cm above the agreed-on red line; the result is outright damage to the water's quality. Due to the sparse rains in the Lake Tiberias water collection area and the lower-than-average volume of streams flowing to the lake, the lake's salinity rose to 234 mg of chlorine per liter in 1989 through 1991, versus 208 in 1988. If the lake's level suffers a further drop under minus 212.90 meters, whether as a result of climate conditions or following water commissioner's instructions, the lake's salty springs are liable either to gush forth at an increased rate or to flow off the coast—where they can be located and diverted—to sites inside the lake, where they will be uncontrollable.

State Comptroller Miryam Ben-Porat's most recent report about the management of water resources, published last January, dwells on the deteriorating quality of water. The report's grave findings were used by Agriculture Minister Refa'el Eytan as a pretext to fire former Water Commissioner Tzemah Yishay, but even earlier state comptroller reports noted the considerable loss of agricultural irrigation water caused by the large quantities of sewage water which are never cleansed at all. The fact that sewage water is not processed inflicts grave damage on the desperate condition of the water resources. The reports spoke of deteriorating water quality both in the surface and the underground water reservoirs.

Former Water Commissioner Yishay had suggested buying water from Turkey and transporting it in huge plastic tanks towed through the sea. [passage omitted] The new water commissioner has dismissed the idea of imported water. "It may be a good topic for conferences and politicians," he said. "If we are invited to a regional water conference, we will come, but we will not treat its contents seriously. Dealing with a sensitive issue such as water, we cannot afford to rely on Turkey or any other Middle East country."

Zaslavski contended that in the foreseeable future, the drinking water problem can be solved only by desalinating sea water and saline water. He claimed that Haifa and environs, which are almost exclusively dependent on water from Lake Tiberias and are therefore more liable to remain without drinking water, should be given top priority in the supply of desalinated water. [passage omitted on desalination projects]

JORDAN

Water Shortage in Kingdom Reaching 'Critical Stage'

Emergency Project for Amman

92WN0045A Amman JORDAN TIMES in English 8 Sep 91 p 3

[Text] Amman—The Ministry of Water and Irrigation is proposing an emergency project designed to make available an additional 20 million cubic metres of drinking water to Amman by the summer of 1992, a senior official said Monday.

"We are working on an immediate crash programme to exploit some reserves and channel water from different locations around Amman at a cost of around 15 million JD [Jordanian dinars], said Mu'tazz Balbisi, director-general of the Water Authority of Jordan (WAJ).

Technology and manpower for the project are locally available but pipes and pumping equipment will have to [be] imported, Mr. Balbisi said, expressing hope that the government will provide the necessary funds.

However, he added, there is no plan to increase tariffs.

Economists noted that water prices in Jordan were high and that the government was subsidising water by financing a large part of the WAJ's operations—an issue raised by the International Monetary Fund (IMF) in its recommendations for an economic austerity programme for the Kingdom.

The WAJ director-general emphasised that the "immediate crash" project for Amman cannot be the answer to the national shortage—"we are living on the red line now"—and long-term solutions have to be found.

Another interim solution under study is replacement of leaky pipes—blamed for a 25-percent loss of pumped water—and improvement of the supply network in the capital. This is expected to cost at least 25 million JD and the WAJ is discussing various options with international financing agencies.

The WAJ chief said Jordan has been registering a 10 percent annual growth in demand for water and noted that the problem of water shortage has become acute since 1987.

Recent statistics indicate that Amman was facing a perennial shortage of 90,000 cubic metres of water everyday.

Mr. Balbisi said the national shortage was 35 million cubic metres of water every year and this volume is expected to grow to 70 million in 1991 in view of the dramatic increase in population by the return of hundreds of thousands of expatriates from the Gulf.

The WAJ has managed to cut down by 25 percent the volume of water pumped into Amman through a rationing system and this will have to continue until long term solutions are implemented, he said.

Drinking water for Amman residents comes from several sources, including acquifiers in Mafraq, Azraq, Suwaqqh and Qatranah, he said.

All these sources are located in the northeast and southeast of Amman and that is the reason why west Amman residents face a bigger water problem than east Amman residents, Mr. Balbisi said.

"For the first time, we had to introduce water rationing in the eastern neighbourhoods of Amman this year," he said further underlining the problem.

Immediate, Intermediate Solutions

92WN0044B Amman JORDAN TIMES in English 9 Sep 91 p 4

[Editorial: "Water—Solutions in a Murky Situation"]

[Text] Water shortage had been fast reaching a very critical stage in the Kingdom. With 90 percent of the country being semiarid, enjoying less than 90 millimetres of rainfall annually, the influx of some 300,000 returnees from the Gulf region has made the situation much worse for all of us. The capital's water problem has lately been described by its municipality as having already reached the red line with the difference between demand and supply as well over 90,000 cubic metres. Currently Amman Governorate receives only 210,000 cubic metres of water while its actual needs surpass the 300,000 cubic metric figure. Elsewhere in the Kingdom the water shortage problem is not much less acute. The south is particularly vulnerable because rainfall there is generally very low. According to government figures the country consumed about 180 million cubic metres of water in 1989 but is projected to consume about 380 million cubic metres by the turn of the century.

This critical situation obviously calls for immediate and intermediate solutions before the problem becomes totally insolvable. Long-term plans are also needed but futuristic answers would require regional arrangements constructed on political understandings that as yet do not exist among the various countries of the area.

On the immediate level, one could think in terms of drastic actions such as putting a freeze on housing construction or applying even more prohibitive rates on increasing water use. Stopping or even scaling down on construction, however, is not feasible simply because there is an abrupt and understandable upsurge in demand for homes to allow for the large and sudden increase in population. Applying higher rates for water use, on the other hand, is already being applied to make Jordanians more conscious of the water crisis in their country and any further increase would have to be extremely limited and selective. Making such rates even higher may indeed help but it would not rectify the situation completely.

But there are other more reasonable avenues available for immediate application. On top of the list would be to arrest wasting water, especially due to leakages from main water networks and pipes conservatively estimated to reach almost 50 percent of the water supply. Secondly by stopping the contamination of water resources, the country stands to redeem much of available water supplies. The extent of the losses attributed to contamination can be best illustrated by the disastrous story of King Talal Dam. Consequently we may think in terms of recycling waste water until other water resources are developed, and of shifting agricultural patterns to make them suit better our soil and climate.

On the intermediate level, the construction of more mini, low-cost dams across the country also provides greater hope to tackle the problem. Indeed the government has called for the construction of a series of such dams, especially in the desert areas where the collection and preservation of any amount of rainfall stands to alleviate the gravity of the water shortage.

In the long term, a regional conference along the lines of the proposed Istanbul conference may offer the kind of permanent solution that all the countries of the areas need. Such a conference needs to be well prepared for in order to enhance its degree of success. Such a successful enterprise can indeed turn water from a potential war causing factor into a mechanism to promote long-term stability and peace in the Middle East. Granted the future of the proposed Turkey meeting later this year hangs in the balance over the matter of Israeli participation in it. But Israel has to understand that it too stands to suffer greatly from lack of progress on the peace front and that without a serious effort on its part to solve the Palestinian problem it will continue to face isolation, even on the water level. This is why the beginning of the long process to heal the water shortage in the region must be launched, with or without Israel, depending on whether the Jewish state is ready to cooperate and be part of a new regional set-up that stands for prosperity and peace.

Ruwayshid Dam Project

92WN0045C Amman JORDAN TIMES in English 10 Sep 91 p 3

[Text] Amman (J.T.)—A local consultancy services office has won a 42,000 JD [Jordanian dinars] contract from the Ministry of Agriculture to supervise the construction of a dam at Ruwayshid near the Iraqi border.

The estimated 600,000 JD project will be carried out in the Hammad Basin, which is being developed by the government to settle eastern desert tribes and boost agricultural production.

A local construction firm had won the contract and, according to the Ministry of Agriculture, work on the construction of the dam was expected to begin this month. The dam, one of several being set up in desert regions to collect rain water, will have a 10 million cubic metre capacity and will be finished before the end of the year.

According to the ministry, the dam will largely benefit the sheep and stock breeders, offering them water for their sheep and cattle and helping to expand the pasture areas in the eastern parts of the country.

Minister of Agriculture Subhi al-Qasim signed the contract with the manager of the consultancy office in Amman. The Ministries of Water and Irrigation and Agriculture are currently joining hands to build Wadi

Rajil Dam in Azraq, which will have a 3.5 million cubic metre capacity. A statement said that the work will soon start on this new dam.

Dr. Kamal Radaydah, head of the Water Harvesting programme at the Ministry of Water and Irrigation said that a total of nine earth dams in the desert regions have been set up to collect rain water. These are Samma al-Sarhanib, Ghadir, al-Khalidah, Burqu', Abu-Sawwanah Dam, Mawaqar, Qatranah and Sultan.

According to Dr. Radaydah, designs have been prepared for the Suwaqah and Wadi Jordah Dams in the Qatranah and Ma'an regions but work cannot start pending the availability of funds.

Government Studies Options

92WN0044D Amman JORDAN TIMES in English 11 Sep 91 pp 1-2

[Text] Amman—Alarm bells are ringing in Jordan with concern mounting over the future of water availability in the Kingdom. It is widely accepted the problem cannot be solved without better understanding among the region's countries and that the entire issue is expected to be one of the major topics for negotiations at any Arab-Israeli peace talks.

Meanwhile Jordan has been studying the options available to it to address the problem in all its short-, medium- and long-term dimensions and has come up with the finding that the relatively least expensive means to partly address the problem is to pump water from a reservoir straddling the Jordanian-Saudi border in the south.

But any such venture is going to be a political minefield since part of the reservoir is in Saudi territory, and given the reservations that Gulf Arabs have while discussing anything related to water resources it is going to be a tough task before securing Saudi cooperation. Based on this, Jordanian officials are very guarded in their comments; in some cases they make no comment at all.

Estimates drawn up by the Water Authority of Jordan (WAJ) indicate a minimum capital investment of 240 million JD [Jordanian dinars] to set up a water network involving more than 200 km of pipelines only to bring Disah water to Amman. Operational costs could be anywhere between 15 million JD and 20 million JD and the project could take between three and five years to complete.

The project involves water for drinking and industrial purposes; alternate means have to be found to have the precious commodity available for irrigation purposes.

While figures and plans look excellent on paper, the question that remains to be answered is: Where would the financing for the Disah project come from, if indeed it could take off the ground?

Economic experts point out that Jordan, which is struggling under the burden of $8 billion in foreign debts, cannot hope to raise local financing for such a huge venture; nor can it depend on foreign sources as long as it is burdened with this debt.

The problem of drinking water has been a perennial feature in any developmental planning in Jordan for many years. But the issue became acute over the past few years.

"We have been living on the so-called red line for the past three years," commented Mu'tazz Balbisi, chief of WAJ. "We have been scraping through, but the situation is not bright at all," he said.

Mr. Balbisi noted that Jordan has been registering a steady annual growth of 10 percent in demand for drinking water. Annual consumption grew from 125 million cubic metres in 1986 to 150 million in 1987, 165 million in 1988, 170 million in 1989 and 178 million in 1990.

"These figures are only related to consumption, not actual demand," said Mr. Balbisi, noting that WAJ statistics indicate that Jordan was running short of 35 million cubic metres every year even before the influx of returnees increased the Kingdom's population by 300,000—adding another 35 million cubic metres to the shortage.

At the present rate of pumping and consumption, Jordan's resources of drinking water will run out by the year 2000, and long-term planners are extremely concerned that implementation of programmes should start as soon as possible so that Jordan would not find itself trapped in a situation where there may not be any way out.

"We have studied all options available," said Mr. Balbisi. "These include import of water from our neighbours as well as desalination in addition to pumping from Disah, and the most viable option is indeed the latter," he told the JORDAN TIMES in a recent interview.

Importing water may be cheaper compared to desalination, but Jordan obviously does not want to leave itself vulnerable to political pressure from any quarter by investing limited funds in importation projects which could be turned off by external forces.

Senior officials have repeatedly said that water is going to be a major topic on the Middle East peace negotiating table with Israel and all other parties concerned.

Jordanian officials are believed to be already at work on the various regional dimensions of the issue. By all international standards, all of Jordan's neighbours are better off in securing their water needs.

Upstream Syria is in a better position to control and regulate the downstream flow of water sources after ensuring that its needs are taken care of. Israel, which has

also diverted part of a key Lebanese river, gets the second shot at these sources, and Jordan has to be content with the leftover.

Syria, which also benefits from part of Euphrates water flowing down from Turkey, does not face any serious water problems. However, drinking water is rationed in Damascus although the measure is not formally announced.

In addition to the regional and domestic sources, Israel has been exploiting acquifiers in the occupied territories.

Oil-rich Saudi Arabia has set up desalination plants all along the coast to boost the availability of drinking water for its population.

That leaves Jordan with very few options.

"The main problem is that other parties to existing agreements on water-sharing never lived up to their obligations," said a senior official. "Jordan always got the raw end of the deal," he said.

A $450-million project to build a dam on the Yarmouk River on the Syrian-Jordanian river got bogged down after the powerful Israeli lobby in Washington blocked financing insisting that Jordan and Syria would be "depriving" the Jewish state of its "rights to regional water."

Now everyone concerned believes that the project can take off only after the issue has been properly addressed at peace talks with Israel.

"We are planning our own strategy in the water context at the (proposed) peace conference as and when it is convened," said the Jordanian official, who preferred anonymity. "No doubt everyone else is also doing the same thing, but by all international norms and practices there is no doubt that Jordan does have a stronger case than most," he said.

Zalygin Highlights 'Environmental Catastrophes'

92WN0041A Moscow ZEMLYA I VSELENNAYA in Russian No 3, May-Jun 91 [signed to press 30 Apr 91] pp 30-34

[Report by E. K. Solomatina on a press conference conducted by S. P. Zalygin, chairman of the Ecology and Peace Association, in February 1991 in Moscow: "Environmental Disasters in the USSR: Facts, Causes and Consequences"]

[Text] Environmental disasters are considered no less dangerous today for the earth's future than the nuclear threat. Chernobyl, the Aral, the crisis state of the Black Sea, which is being poisoned by pollutants, the turning of the great Russian Volga River into a chain of artificial, stagnant seas—these are just a few from a sorrowful list of environmental disasters, and only a list of those within our country. In recent years a good many environmental-protection organizations have been established in our country, including the Soviet Ecology and Peace Association. This nongovernmental organization of scientists and public-affairs writers, which is headed by its well-known writer S. P. Zalygin, editor in chief of the magazine NOVYY MIR, has been conducting independent public expert evaluations of the most dangerous projects entailing the alteration of nature, and has been working out new ecological concepts for the development of the country and individual regions of it. The association also views its objective as the development of public environmental consciousness and international cooperation in addressing environmental-protection problems.

The board of the Ecology and Peace Association, which was organized in 1987 under the Soviet Peace Committee, includes full members of the USSR Academy of Sciences and All-Union Academy of Agricultural Sciences, and USSR people's deputies. These include academicians A. L. Yanshin, B. S. Sokolov, N. A. Shilo, G. S. Golitsyn and V. A. Tikhonov; A. S. Monin and A. V. Yablokov, corresponding members of the USSR Academy of Sciences; Doctor of Economic Sciences M. Ya. Lemeshev, Doctor of Geographical Sciences B. V. Vinogradov, and other scientists and scholars who are prominent in our country and in the public environmental movement. The association was established by scientists and specialists, who in 1983-1986 conducted a comprehensive independent expert evaluation of projects for diverting part of the flow of northern rivers to the south and part of the flow of Siberian rivers to Central Asia and Kazakhstan, and the materials of the expert review provided scientific substantiation for the adoption in August 1986 of the CPSU Central Committee's and USSR Council of Ministers' Decree: "On the Termination of Work on Diverting Northern and Siberian Rivers." With the active efforts of the Ecology and Peace Association, it has also been possible to turn aside other, similar projects, such as the "Volga—Chogray," "Volga—Don-2" and "Danube—Dnieper" projects.

"Environmental Disasters in the USSR: Facts, Causes and Consequences" was the title of a press conference for Soviet and foreign journalists that was held this February in the USSR Ministry of Foreign Affairs' Press Center. It was conducted by S. P. Zalygin, the association's chairman, and a group of scientists, along with Deputy Minister of Foreign Affairs V. F. Petrovskiy. They drew the attention of the press conference's participants to three major environmental disasters in our country—the Aral basin, the Lower Volga and Caspian region, and the Neva inlet and Gulf of Finland. The crisis in these regions continues to intensify and is creating a threat to the future not only of our country but of its bordering territories. "The imposition of the problems of Chernobyl and the Aral on the problem of the Persian Gulf," S. P. Zalygin said in opening the press conference, "may create an absolutely new, very serious, even ruinous situation throughout the entire world, and the two centers, the Aral Sea and the Persian Gulf, may merge into a single region of unprecedented and totally unforeseen disaster."

The **Aral crisis**, as a rule, is associated with the drying up of the Aral Sea. The sea is perishing, it must be rescued and filled with water! But the problem, in reality, is much more complicated. The Aral is nothing more than a symbol and the end result of a distorted and one-sided means of conducting the economy throughout all of Central Asia over the past 30 years. To one degree or another, a vast region of the Aral basin, including both its plains and mountainous parts, where about 35 million people live, has been affected by environmental disturbances. This was discussed at the press conference by Doctor of Agricultural Sciences N. G. Minashina, a professor at the Soil Institute imeni V. V. Dokuchayev of the All-Union Academy of Agricultural Sciences, and member of the board of the Ecology and Peace Association. Along with the drying out of the Aral and the desertification of the Arai region because of the numerous dams, reservoirs and large canals that have been built there, water is building up in other places, where swamps and new man-made lakes are being formed, irrigated land and pastureland are being flooded, and soil is becoming salinized. (ZEMLYA I VSELENNAYA, No 3, 1990, p 33.—**Eds.**).

The government has been allocating large amounts of money to eliminate the environmental disaster, but it has been going to those who brought the region into crisis and continue to carry out hydraulic engineering construction contrary to environmental requirements. First the former Ministry of Land Reclamation and Water Resources, which was later renamed as the Ministry of Water Resources Construction, and now the newly established Vodstroy [Water Construction] state concern, have been represented by the very same people, who besides their work in the Aral basin drew up the infamous water-diversion projects. They are precisely the ones who invested billions of rubles in building the Danube—Dnieper and Volga—Chogray canals, not to mention the Volga—Don-2 Canal, the construction of which has gone too far.

A solution to the Aral crisis—many scientists spoke about this—is possible only by overcoming departmental monopoly. Water resources and the future development of their use in the region must be removed entirely from the jurisdiction of Vodstroy and turned over to a special committee. And top-priority measures must be the restructuring of the economy in the Aral basin, the prompt and drastic reduction of cotton-growing plans, elimination of the massive use of toxic chemical agents, and the changeover to water-conserving irrigation technologies, with the development of a scientifically substantiated and economical plan for the use of water from the Amu-Darya and Syr-Darya rivers.

Doctor of Physical Mathematics A. S. Mishchenko, professor at Moscow State University and deputy chairman of the board of the Soviet Ecology and Peace Association, devoted his presentation to the problem of the **Leningrad dike**. Designed to protect the city against flooding, this system of dams and spillways cuts off the Neva inlet from the water of the Gulf of Finland. Since Leningrad surrounds the shores of the Neva inlet like a horseshoe, practically in the center of the gigantic megalopolis an artificial, closed body of water has been formed, on the environmental condition of which the way the city "feels" is completely dependent.

During the time that the dike was being designed and built, repeated expert reviews were conducted, all of which without exception gave negative assessments of the potential environmental consequences. But the construction went on. Despite the resistance of the executives of interested departments, at the request of a general meeting of the USSR Academy of Sciences, as of mid-1989 an independent expert commission was finally set up under the leadership of A. V. Yablokov, a member of the board of the Ecology and Peace Association and a corresponding member of the USSR Academy of Sciences. The commission reached the unequivocal conclusion: the main reason for the drastically deteriorating environmental condition in Leningrad was the dam that was being built, and it was the dam that had drastically altered the equilibrium in the Neva inlet. By upsetting the natural self-cleansing mechanism, it had turned the Neva inlet into an accumulator of pollutants. The "blooming" of the water and the growth of bacteriological pollution had formed a kind of biological reactor there. The presence in it of toxins and carcinogenic and other harmful chemical substances was creating the danger of epidemics for the major city's population.

The commission established that the project plan for the Leningrad dike lacked any comprehensive environmental feasibility study and assessment of the consequences of building the protective installations, while the hydraulic modeling was based on a false concept, and furthermore, mistakes had been made in the actual execution of the modeling. This was demonstrated by the association's scientists with the participation of leading specialists in the field of hydraulics.

However, the system of ploys that the technocratic lobby uses to push environmentally destructive projects through the government still exists. They include the deliberate concealment or distortion of information, errors in scientific analysis, and the selection of suitable and obedient experts.

"According to the information of the USSR State Environmental Protection Committee," Doctor of Geographical Sciences B. V. Vinogradov, a professor at the USSR Academy of Sciences' Institute of Evolutionary Morphology and Animal Ecology, and a member of the association's board, noted in his presentation, "about 12 percent of our country's territory is located in environmental-disaster zones. One of the largest such zones is the **Lower Volga and the Caspian region**, including Kalmykia. The most intensive desertification in the world is happening there, and the area of shifting sands is growing, as a result of which the productivity of pastures has now declined in some places by more than 90 percent. This territory's environmental situation has been aggravated by the fact that it is located on the outskirts of technologically developed regions and serves as a receptacle for polluted effluent from the basin of the Volga and other rivers.

"Following the tilling of sandy soil, hundreds of thousands of hectares of shifting sands formed. And as the result of unjustified irrigation of land, tens of thousands of hectares of land have become salinized and swampy. The attempt to carry out the construction of the Volga—Chogray Canal in Kalmykia has removed tens of thousands of hectares more of agricultural lands from production" (ZEMLYA I VSELENNAYA, No 2, 1990, p 33.—**Eds.**).

As an alternative to the costly, economically ruinous and environmentally dangerous projects of the Ministry of Water Resources Construction, a group of scientists from the USSR Academy of Sciences and the All-Union Academy of Agricultural Sciences has drawn up its own concept of the agricultural and ecological development of these territories. The concept is based on the broad reclamation of sands for agricultural use and forestation, the improvement of pastures, the restoration of meadows, the development of local water supplies, and the restoration of the conditions in which the Kalmyks' traditional way of life developed. This alternative is economically effective, environmentally useful, and socially propitious. Its cost is estimated at approximately 1.5 billion rubles (as against R4.5 billion for development through hydraulic engineering construction, not counting the extensive environmental damage caused by the latter). The environmental and economic crisis of the Chernyye Zemli is highly instructive. In past years an additional output of approximately R400 million was obtained as the result of the predatory exploitation of those lands. But now R1.5 billion needs to be invested in order to restore the territory's natural potential. Therein lies the difficulty of our situation today.

Among the numerous questions asked the scientists at the press conference, two were especially trenchant. The first: is it a good idea to set up international commissions to address environmental problems in our country? After all, we have enough of our own highly qualified experts among our scientists. "International commissions must be established," USSR Deputy Minister of Foreign Affairs V. F. Petrovskiy answered this question, "because in certain cases it is impossible to reach agreement among our scientists, who have various views of a given problem." However, there was also another answer: international commissions are established (and hundreds of thousands of dollars are found for this in a situation of economic crisis!) in order, by paying for the services of foreign experts, to obtain findings that are convenient to interested departments. The second question: is the USSR Supreme Soviet discussing the question of the huge sums (in both rubles and hard currency) that are being spent by the government for the purposes of environmental protection? A. V. Yablokov, deputy chairman of the USSR Supreme Soviet Committee on the Environment and a member of the board of the Ecology and Peace Association, answered that the USSR Supreme Soviet had still not interested itself in how those sums are being spent.

The many years of study by members of the Soviet Ecology and Peace Association of the three biggest environmental disasters in our country will be discussed at the UN scientific conference "The Environment and Development," which will be held in Brazil in 1992.

USSR Environmental Expenditures Detailed

92WN0089A Moscow EKONOMIKA I ZHIZN in Russian No 35, Aug 91 p 6

[Unattributed article "based on data of the USSR State Committee for Statistics": "Are We Protecting Nature?"]

[Text] Data from a selective poll conducted at the end of 1990 among inhabitants of 850 cities and settlements, in which the occurring ecological situations are either quite tense or relatively favorable, testify that the population's degree of concern over the condition of the environment has not diminished. More than half, or 54 percent of the urban populace polled, were not satisfied with it, 20 percent were satisfied only in part, and only eight percent were quite happy. The rest had difficulty responding.

Out of about 15 ecological problems included in the survey questionnaire, the following are considered to be the most pressing by the city dwellers: Pollution (gas content) of the atmosphere—81 percent of those polled expressed concern; pollution of drinking water—73 percent; local radioactivity situation and trash in localities—71 percent of those polled.

The scope of impact on the natural environment, as well as the rationality of the use of the most important natural resources in the past five-year period and the period before that are characterized by the following data:

	1981 through 1985 (average per year)	1986 through 1990 (average per year)	1990
Discharges of harmful substances into atmospheric air, total, million tons	110.2	98.3	90.7
including from:			
stationary sources	70.2	62.4	55.7
motor vehicles	40.0	35.9	35.0 *
Intake of water for use from sources of water, total, billion cubic meters	328.8	330.3	329.1
Discharge of polluted production and municipal waste water into bodies of water, billion cubic meters	17.6	26.1	33.6
out of which in the tributary areas of:			
the Black and Azov Seas	4.0	6.2	7.7
the Baltic Sea	2.7	3.3	3.6
the Caspian Sea	3.8	10.7	12.5
out of which the river Volga	2.6	8.2	11.1
Lake Baykal	0.12	0.17	0.19
* Estimated			
Industrial logging, thousand hectares	2,138	2,138	1,957
Reforestation, thousand hectares	2,153	2,187	2,138
Timber abandoned at logging sites, million cubic meters	1.88	2.54	2.63
Forested areas affected by fires, thousand hectares	325	1,014	1,384
Generation of wastes by mining enterprises and enrichment wastes, million cubic meters	2,746	3,163	3,156
Rate of waste utilization, percent	39	40	40

In 1986 through 1990, the overall amount of outlays for environmental protection (taking into account outlays for forestry operations) amounted to an average of about 12 million rubles [R] a year. Compared to 1981 through 1985, they increased by R3 billion, or by one-third. In 1990, the overall volume of outlays indicated increased to almost R13.5 billion, which corresponded to 1.3 percent of the gross national product (GNP) generated by the enterprises of the production and nonproduction spheres. In the past five-year period, ecological spending relative to the GNP did not change.

The overall amount of outlays for environmental protection in the United States considerably exceeds their volume in the USSR and comes to tens of billions of dollars a year.

In 1990, state capital investments of R3.2 billion were used for environmental protection and rational use of natural resources, or one-quarter more than in 1985. In addition, leased enterprises used R23 million in capital investments to this end last year. Between 1986 and 1990, the overall volume of capital investment used for environmental protection increased annually, whereas in 1990 it dropped by R74 million compared to 1989.

This spending as a share of the total volume of investment into the national economy in 1986 through 1990, virtually did not change and came to less than two percent (in the United States, approximately 0.5 points higher).

The value of fixed assets used for environmental protection at the enterprises of all sectors of the national economy came to more than R44 billion by the end of the five-year period, or 1.5 percent of the value of all fixed assets of the country. Between 1986 and 1990, the share of ecological assets in question virtually did not change.

As in previous years, capital investment allocated for construction for the purposes of environmental protection was consistently under used in the past five year period. Between 1981 and 1985, the volume of unused funds came to R1.7 billion, or 13 percent of the allocation, in 1990 it was R0.7 billion, or 19 percent (in comparable prices, in millions of rubles).

	1981 through 1985 (average per year)		1986 through 1990 (average per year)		1990	
	actually used	percentage of the allocation used	actually used	percentage of the allocation used	actually used	percentage of the allocation used
State capital investment in environmental protection and rational use of natural resources—total	2,224	87	2,963	87	3,158	81
of which for:						
protection and rational use of water resources	1,617	87	2,003	85	2,056	78
protection of atmospheric air	180	80	333	81	409	78
protection and rational use of land	235	90	365	104	457	108
protection of mineral wealth and rational use of mineral resources	106	91	169	92	128	74

In the last five-year period, no improvement occurred in statistics describing the final results of the investment process in construction for the purposes of environmental protection. The commissioning of ecological facilities dropped. On the average per year, waste water treatment facilities for 0.4 million cubic meters per day were commissioned, or seven percent less, compared to 1981 through 1985; for systems of closed-circuit water supply—correspondingly 4.6 million cubic meters per day (19 percent) less; and for installations for capturing and neutralizing harmful compounds in discharged gases—6.1 million cubic meters of gas per hour (15 percent) less.

USSR Official Calls Environment 'State Security Problem'

92WN0068A Moscow TORGOVAYA GAZETA in Russian 22 Oct 91 p 4

[A.V. Yablokov, deputy chairman of USSR Supreme Soviet Ecology Committee, interviewed by L. Glazkova: "Ecology Today Is a State Security Problem, in the View of A.V. Yablokov, RSFSR State Adviser and USSR People's Deputy"]

[Text] **USSR Academy of Sciences corresponding member A.V. Yablokov is deputy chairman of the USSR Supreme Soviet Ecology Committee. He is now also responsible for ecological and health problems in the RSFSR State Council.**

[Glazkova] Aleksei Vladimirovich, how serious is the problem of ecology in our country?

[Yablokov] The situation is not bad but desperate. Sixteen percent of the territory of the former USSR, where something on the order of 45 million to 50 million people live, lies within ecological hazard or disaster zones. Most of these areas are major industrial regions, such as the southern Urals, Kemerovo Oblast, and so forth.

We are breathing increasingly dirty air. We are drinking increasingly dirty water. We are eating increasingly dirty and unsafe foods. As a result, the incidence of disease is growing, the frequency of congenital defects is increasing, and life expectancy is declining. So ecology today is a state security problem.

[Glazkova] I don't think you'll find anyone who is not concerned by the problem of food product quality. What can you say about it?

[Yablokov] Agricultural monitoring of food products is supplemented in our country by monitoring on the part of a network of sanitation and epidemiological stations. They are to be found in every rayon, but not all of them have sufficiently good equipment and the capability to conduct highly skilled analyses. Nevertheless, the several thousand centers that exist study each year nearly two percent to three percent of all basic food products. The results are not only alarming, they make you shudder. Up to 40 percent of the output of children's milk kitchens contains pesticide levels hazardous to health. DDT is to be found in 70 percent of all dietetic butter. Half of all vegetables are dangerous because of contamination with pesticides and mineral fertilizers, mostly nitrogen fertilizer. Incidentally, that's also why they keep so poorly. On the whole, nearly 30 percent of all food products are contaminated. The tragedy and absurdity of the situation consists in that we are unthinkingly copying Western farming. We don't need pesticides or mineral fertilizer, because they begin to act and to produce higher yields only in areas that already have high yields (say, 40 centners of grain per hectare) and that require superhigh yields (60 to 70 centners). Our own medium level of 16 to 17 centners allows us to get by just with good farming methods and natural soil fertility.

[Glazkova] In a certain sense, no doubt, it's not quite appropriate to speak about a lack of ecologically pure food products at a time when food products are in short supply generally. Is the threat of famine real, as some assert, or is this a destabilizing myth, as others assure us?

[Yablokov] It is expected that this year's harvest will amount to 70 percent of our average harvests. When you consider the fact that three-fourths of all vegetables in previous years rotted before reaching the stores, that at least 40 percent of all food products spoil in storage, then in principle we have sufficient grain, potatoes, and vegetables to feed the population. In my view, a political mechanism for impeding reforms has now come into play. Rural areas have more food, while major industrial centers are under a kind of blockade. We have carried out a revolution at the top and removed the people who were impeding rapid progress toward a market economy, especially those who shone during the putsch; but the average level of administration has stayed the same. We estimated that by the end of the year, hundreds of thousands of private farmers would appear, farmers who could solve the food problem, but they number only somewhere in the area of 30,000 to 35,000. The process has been stalled: They are not being given land, their farms are being set afire, supplies are being blocked. What is the solution? The hope is that the former party structures and the military-industrial complex would move quickly toward the market. Now people are looking for party money, but if it exists and is thrown at the market economy, thank God.

The question is not just one of shifting toward the principles of a market economy, but also of completely revamping its entire structure. This will take years, which history has not allotted us. We'll have to get through a couple of hard years. And we'll need help from all over the world—not in food, but investments.

[Glazkova] What are the developmental trends for the ecological situation in the near future?

[Yablokov] Unfortunatley, they are going to get worse. Ecological refugees have already appeared. We are witnessing the appearance of previously unknown dieases. People have already written about children growing bald in Chernovtsy, and the same has been observed in the Baltics, Magnitogorsk, Moscow, and Yakutia. The culprit is probably thallium. In areas surrounding petroleum-refineries and distilleries, children have developed tics and trembling hands, an ailment that disappears three months after they are moved to another area. In Karelia I saw children suffering from fluorosis—destruction of the teeth as a result of fluoride from the waste products of an aluminimum plant that are getting into drinking water. This is terrible! In all eight cities with plants producing protein-vitamin concentrates, the public was found to have allergies. Incidentally, the recent incident of mushroom poisoning in Krasnodar Kray could be linked with either local chemical contamination of the soil or the appearance of some sort of new combinations of toxic substances.

We intend to use all possible economic levers to alleviate the urgency of the situation. For example, fees for natural resource use are to be introduced. The money will go to local governmnet bodies for specially designated ecological accounts. I hope that within two to three years the situation will begin to stabilize.

[glazkova] What strategic ways of improving environmental protection do you see?

[Yablokov] The incorporation of market levers, which are widely used in the developed countries. The principle is this: The polluter pays. Plus a well-thought-out taxation policy.

[Glazkova] Does this mean we're doomed to an endless pursuit of prosecutions?

[Yablokov] I wouldn't say that. The entire world can't consume as much energy as they West consumes. We need to look for a different, more economical model of using natural resources. An aspiration on the part of every person to have his own car or airplane is absurd from the standpoint of the social ideal. We have abandoned good-for-nothing barracks socialism, but in actual

fact the world is nonetheless moving in a socialist direction, toward the socialization of nature. Already, the United States, France, and Italy have the notion that every person has a right to shorelines. Sweden has the notion that every person has a right to the forests. In Britain, a person cannot move a fence on his land without permission, because this could change the landscape, which is a national asset.

[Glazkova] And so we will move in this direction in the long term. But what is being done to restore the environment today?

[Yablokov] Two years ago, the USSR Supreme Soviet that everyone is cursing today adopted a resolution, the most sonorous in our history, on urgent measures to improve the ecological situation in the country. Nearly 50 environmental-protection procuracies have been created. The introduction of the notion of the ecological crime in legislation is on the agenda. Unfortunately, this work at the union level has now ceased in light of the transfer of these matters to the republics.

[Glazkova] An incidental question. Since we talk a great deal about the need for a single economic and other kinds of spaces, then no doubt God himself commands that we also create a single ecological space.

[Yablokov] That's absolutely correct. No individual republic is can deal with ecological disasters on its own. This has been demonstrated by Chernobyl and the Caspian, Aral, and Black seas. Now Russia has unveiled an initiative to quickly conclude an interrepublic ecological agreement. Common norms and common or similar laws are indispensable. Since we are now entering the European home, we must also address the question of convergence of the environmental-protection legislation of all the countries participating in the Helsinki agreement. We can survive only if we work together.

USSR Environment Minister Vorontsov Seeks Kurils International Reserve

92WN0089B Moscow KOMSOMOLSKAYA PRAVDA in Russian 29 Oct 91 p 3

[Article by N. Vorontsov, USSR minister for the use of nature and environmental protection, RSFSR people's deputy: "Our Eared Seals Will Not Learn Japanese. A Look at the 'Edge of the Earth'"]

[Text] In the post-war years, the Kuril Islands became the front edge in a confrontation between two worlds. Only fishing enterprises were developed. Their closed nature and a shroud of secrecy interfered with the development of these territories.

Recently, there have been frequent references to how neglected the localities are in the South Kuril Islands, including the Golovnin settlement, Yuzhno-Kurilsk, and Malo-Kurilsk, as well as Kurilsk. Their desolate existence is compared with the prosperity of cities and settlements on the Japanese mainland. While not justifying in any way our indisputable economic and political miscalculations in developing the Far East, I would like to recall that the population of the South Kuril Islands and the administration of Sakhalin Oblast have actually lived under a sword of Damocles since 1954. The people do not know whether they are masters of this land or not; nor do they know what is going to be decided behind their backs. Their children were born there, and the first grandchildren of citizens of the Kuril Islands have now come along; nonetheless, everything has remained up in the air. From this standpoint, current protests by the Russian population of the Kuril Island and Sakhalin Oblast appear justified to me.

We mention how little has been invested in this region. But I would like to note that in the last 46 years, the South Kurils have been studied by Soviet scholars very profoundly (and at great expense!). I will quote only the most obvious examples.

The Biological and Soil Science Institute of the USSR Academy of Sciences Far Eastern Division has carried out a series of long-term expeditionary studies of the fauna and flora of these areas. This research became the foundation for developing environmental protection measures for the entire region. Soviet microbiologists have engaged in particularly interesting world-class studies. Soviet vulcanologists have studied such outstanding subjects as the Tyatya Volcano, the Mendeleyev Volcano, the Golovnin Volcano, and a number of other volcanoes on Kunashir.

Our hydrobiologists and marine biologists from the USSR Academy of Sciences Zoological Institute in Leningrad, the USSR Academy of Sciences Institute of Oceanology in Moscow, and the Institute of Marine Biology of the USSR Academy of Sciences Far Eastern Division have studied the biology of the littoral zone of the South Kuril Islands and discovered hundreds of species which were new to science.

The South Kuril Islands and the Kuril Islands in general are a most important migratory route for the northwestern area of the Pacific. The fate of a bird population numbering in the millions in the northwest Pacific area depends on the condition of environmental protection on the Kuril Islands. The Kuril Chain, in particular the South Kuril Islands, play a tremendous role as a location for the maturation and migration of the salmon of the Far East. More than 1 million tons of fish are caught annually in the vicinity of the South Kuril Islands (by comparison, all countries together catch 350,000 tons in the Baltic Sea).

Relevant conventions exist between the Soviet Union and Japan which, unfortunately, have been repeatedly violated by Japanese fishermen.

The ecologically-minded public has come out many times against the continuing extermination of whales by Japanese whalers in the oceans of the world. This process will hardly be stopped if the northern territories are

handed over. Ringed seals procreate on the small islands of the Minor Kuril Chain; there are eared seal lies. Colonies of the most valuable fur animal, the "sea beaver," or sea otter, have been preserved along the shores of Iturup. Expeditions of the legendary research ship Vityaz in 1948 and 1949 offered an absolutely new look at the structure of the organic world in adjacent marine areas. It was here that Academician A. Ivanov discovered representatives of a new type of animal, pogonophora phylum. Studies by A. Ivanov, L. Zenkevich, P. Ushakov, G. Belyayev, and O. Kusakin have become contributions to a golden treasury of world science. New subsurface ranges, such as the Vavilov and Obruchev Mountains, and a number of other underwater heights, including those in the vicinity of the South Kuril Islands, were actually discovered during the Soviet period. The structure of the Kuril Trough, stretching to the east of the Kuril Chain, which is among the deepest in the world, has been studied in the most thorough manner; underground volcanoes were discovered near the shores of Kunashir and Iturup. Research by Soviet seismologists is highly significant. Manifestations of marine volcanic activity have been studied here, on the Kuril islands; earthquake centers were located, and a quite perfect tsunami warning service was created. When we say that nothing was invested in developing the South Kurils it is absolutely unfair. Indeed, the investment in the infrastructure of settlements was criminally small. However, the contribution of Soviet science to the study of the South Kuril Islands has been tremendous. This contribution could become the basis for the prosperity of this territory within Russia.

So, what is to be done about the issue of the "northern territories?" First, I am convinced that the South Kuril Islands—not only the Minor Kuril Chain, including the islands of Shikotan, Polonskiy, Zelenyy, Yuriy, Anuchin, and Tanfilyev, but also Kunashir—should be turned into a demilitarized zone.

Second, this territory amounts to an absolutely unique natural complex. I believe that it would be feasible to urgently organize an international reserve together with an adjacent natural park and a recreation zone on the entire Minor Kuril Chain, in part of the areas on Kunashir and perhaps even Iturup. Apparently, in the process the Japanese side could allocate to the reserve one of the two northern capes of Hokkaido. This international reserve consisting of Japanese and Soviet parts should be open to researchers from these countries and the world community at large.

Third, it appears that joint Soviet-Japanese enterprises, particularly marine farms, could be opened in the territory of Kunashir and Iturup. It is obvious that the issue of using the biological resources of this zone wisely should be considered seriously. We should be mindful of the fact that tiny uninhabited islands, such as Yuriy, Anuchin, and Tanfilyev Islands, may play a very great role as sites for concentrations of bird nesting areas, lies of marine animals, and areas of fish maturation. All of these islands, even large ones like Kunashir and Iturup, appear to be small blots when you see them in Moscow on a small-scale map. Meanwhile, each one of them is comparable to the southern coast of the Crimea in terms of size and uniqueness.

The Soviet delegation made proposals to organize a joint reserve, incorporating the extreme northern areas of Hokkaido and the South Kuril Islands, at negotiations in Tokyo between the representatives of Soviet and Japanese environmental protection organs. Japanese researchers acknowledged the indisputable need to set up the reserve at this particular location. However, it was felt in the course of the negotiations that the Japanese environmental protection specialists were not free to pursue their interests. Big-time politics was making the people tense.

What will happen if the South Kuril Islands are handed over to Japan after all?

There is absolutely no doubt that a quite rapid economic development of these territories would begin which would be accompanied by the extermination of the richest biological resources. However, the main point is that there would be refugees. These would be the first Russian refugees from a territory belonging to the Russian Federation. We should bear in mind that refugees provide the nutritive environment for sustaining all forms of nationalism. Let us recall that the resettlement of the Ostsee Germans from the territory of the Baltic states, which began after the end of World War I, produced a stratum of migrants in Germany which became one of Hitler's social bases. A revision of state borders will set a precedent for possible subsequent claims against the Russian Federation and the Soviet Union.

Finally, several words about political dividends. Japanese politicians have succeeded in changing many years of monologue concerning the northern territories into a dialogue. Without doubt, this benefits detente. If the Japanese politicians succeed in ensuring the transfer of the northern territories to Japan, their names will forever go down in the history of their country. But is it not worthwhile for our political leaders, of both the country and Russia, to consider how the future generations will view the transfer of the South Kuril Islands to Japan?

Draft RSFSR State Environmental Program

925D0007A Moscow ZELENYY MIR in Russian No 25-26, Jul 91 [signed to press 11 Jul 91] pp 8-9

[Introduction to and text of the RSFSR Draft Program under the rubric: "Discussions:" "The RSFSR State Ecological Program: The Fundamental Provisions of the Draft"]

[Text] [Introduction] The enormous size of the territory of the Russian Federation, its natural and economic diversity, the varying degrees of acuteness of the ecological problems existing in certain parts of it, and the differences in the cultural and educational levels of the

population have all determined the need for a hierarchical approach to the formulation of a State Ecological Program. In accordance with this, the federal, regional (or basin) and republic (or oblast or kray), and local levels of management of nature use are singled out in it.

The authors' collective, which includes members of the RSFSR Supreme Ecological Council, scientists, and specialists of the RSFSR State Committee for Protection of Nature, has drawn up a draft of the RSFSR State Ecological Program which is based on the following:

- the concept of the Ecological Program of the Russian Federation (the general part, Yaroslavl-Moscow, 1991;
- the concept of the economic mechanism of nature use in the RSFSR in conditions of the transition to market relations, prepared under the leadership of I. T. Gavrilov and N. Ya. Petrakov;
- the concept of refining the economic mechanism of environmental protection and rational use of the natural resources of the USSR;
- the draft of the USSR State Program of Environmental Protection and Rational Use of Natural Resources for 1991-1995 and for the Period to the Year 2005;
- proposals of republic, kray, and oblast committees for ecology and nature use;
- developments and materials presented by scientists and members of the RSFSR Supreme Ecological Council.

The proposed RSFSR State Ecological Program is unique in the sense that it is not concerned with just the problems of preserving and restoring the natural environment, but is focused on "ecologizing" the republic's socioeconomic development as the main condition for improving the ecological situation.

The Program is not immediately oriented to the conditions of the market. A transitional period is envisioned during which adaptation to market relations and a gradual transition from rigidly centralized planned management of nature use to a decentralized system of territorial management are to be carried out through step-by-step changes in the economic mechanism. The republic or administrative oblast (or kray) level has been chosen as the base, which corresponds to the processes underway to shape the renewed Russian Federation. It is precisely on this level that it appears possible to consider the processes of development of nature use, the economy, and provision of optimal conditions for the physical and spiritual development of new generations of the population as a unified whole and to combine the mechanisms of management of them within the framework of a unified system.

The following are the RSFSR's strategic goals in the field of environmental protection and rational use of natural resources:

establishment of ecological security for the present and future generations of people through systematic achievement on each particular territory, taking into account its uniqueness, of the quality of the habitat which meets not only the presently accepted sanitary-hygienic norms but also a system of evaluations which takes into account the population's health for at least three-four generations;

restoration and preservation of the biosphere balance (on the local, regional, and global levels) and the genetic fund of the plant and animal worlds, as well as the landscape diversity of the territory of the Russian Federation and the sea shelf adjacent to it;

rational use of all the natural resource potential of the Russian Federation and normal reproduction of renewable natural resources in the interests of ensuring the well-being and physical and spiritual development of the present and future generations of all peoples who populate its territory;

step-by-step resolution of the problems of developing the Russian Federation's economic complex on the way to achieving its complete biosphere compatibility.

The main direction for the republic to emerge from the socioeconomic and ecological crisis is the creation of new economic relations in society which will help carry out the structural perestroyka of the economy on the basis of resource conservation and introduction of the most modern and ecologically clean equipment and technology; and that will help substantially increase the efficiency of social production and resolve many social and ecological problems.

In the transitional period the domestic reserves and existing opportunities to improve the ecological situation which do not require great expenditures must be used to the greatest extent, and new investments must be concentrated in measures with great ecological-economic effectiveness.

The following may be considered the paramount tasks of this period:

launching a new economic mechanism to regulate interrelations of society and nature and conducting an ecological expert examination of programs and plans for all types of economic activity, including plans for the basic directions of the republic's economic and social development;

increasing technological discipline and fulfilling the projected technological parameters at existing production facilities and conserving and preserving resources to the maximum;

combining state and departmental systems of observation and monitoring of the condition of natural resources and objects of the environment which operate on RSFSR territory under uniform methodological and organizational leadership in order to ensure the reliability and compatibility of the information obtained;

increasing the effectiveness of monitoring compliance with existing regulations for nature use by applying

administrative and economic sanctions; and stopping ecological offenses and crimes;

terminating the financing of nature protection measures which are not very effective in resolving the tactical goals and not very promising on the strategic level;

recruiting foreign firms under preferential conditions to create installations of the nature protection infrastructure using modern technologies;

putting up for rent certain natural objects, for example, small lakes for organizing fish breeding and sport fishing, and setting up recreation zones under the strict control of nature protection organs;

creating flexible organizational forms of the nature protection infrastructure, first of all for scientific and information support of management of nature use;

enlisting the population to participate in fact in the cause of preserving the environment.

The successful and effective activity of the organs of state management of nature use depends to a significant extent upon the degree to which they manage to rely in their work on the intellectual potential of scientists and specialists by organizing that potential in such a way that it is available to them and constantly looking after its expanded reproduction.

In present conditions of the organization of economic activity, the formation of a branched network of scientific, design, production, and consultation firms, centers, and organizations under different forms of ownership which work closely with the territorial organs of management of nature use under a contract system is the best way to enlist intellectual resources.

The guiding role of the territorial organs of nature use involves not only determining the portfolio of orders, but also providing financial control for investing capital from the ecological funds and from other sources.

For this purpose it would be advisable to use a form such as associations of ecological organizations under the aegis of territorial committees on ecology and nature use, above all supporting the development in the association of those which are working on the greatest bottlenecks of information support (systematic study of the territory, formation of GIS's [state information systems], and processing of information on the activities of nature users).

Legal support of the RSFSR Ecological Program sets as its goal developing a scientifically substantiated system of ecological legislation and forming an efficient mechanism for realizing it in order to protect the natural environment, organize rational nature use, and formulate a regime of universal ecological security.

The present ecological legal enactments and the mechanism for applying them should be based on harmoniously combining economic and ecological interests given the unfailing priority of a person's right to a healthy natural environment and beneficial living conditions and of maintaining the stability of the ecological systems of the biosphere.

A scientifically substantiated system of ecological legislation must be created in 1991-1993; to do so the following things must be done:

the RSFSR Laws: "On Nature Conservation," "On Ecological Security and a Legal Regime of Ecological Disaster Zones," "On the Accountability of Enterprises, Organizations, Officials, and Citizens for Ecological Offenses," "On Specially Protected Natural Territories," "On the Use of Atomic Energy and Nuclear Safety," and "On Ecological Expert Examinations" must be adopted and legislative enactments must be developed which establish a uniform system for keeping records of, storing, transporting, processing, and burying sources of ionizing radiation and toxic and radioactive wastes and materials and monitoring the places they are buried by envisioning accountability for violating legislation in this area;

existing legislative enactments which regulate relations in the field of protecting and using water, timber, and mineral resources, atmospheric air, and the plant and animal worlds, as well as the natural resources of the continental shelf and the offshore economic zone of the RSFSR, must be made more exact;

the RSFSR codes on land, forests, water, air, mineral resources, and the plant and animal worlds must be adopted;

the concept of a special regime of economic activity of nature use on territories where small peoples and ethnic groups live and carry out economic activity must be developed in order to preserve the conditions of traditional nature use and cultural-economic ways, and the necessary changes must be introduced into legislation.

The employment of accountability for violating ecological legislation is a part of the mechanism for carrying out the precepts of ecology law.

In the area of criminal responsibility for ecological crimes, the elements of ecological crimes presented in the RSFSR Criminal Code of 1960 must be revised.

In the area of administrative responsibility, taking into account the development of entrepreneurial and cooperative activity, fines exacted from citizens for violating ecological requirements must be substantially increased, enterprises and organizations must be included in subjects of administrative fines, and the corresponding changes must be made in the RSFSR Code on Administrative Offenses.

The following must be done in the area of civil responsibility:

a system for legal claims for compensation focused on compensating for losses of natural environment which arise as a result of offenses must be developed;

scientifically substantiated methodologies for calculating damages caused by violations of legislation on protection of atmospheric air, waters, land, mineral resources, forests, the animal world, preserves, national and nature parks, monuments of nature, and plants and animals which are rare and threatened with extinction must be developed;

the practice of compensating for damages to natural resources where the money awarded as compensation for the damages done, instead of being given to the proprietor, owner, or user of those resources who bears responsibility for the condition of the object of nature, is transferred to the state budget, where it then loses its identity, must be changed. The compensation for damages must be paid to the owner or user of the natural resources who suffered the losses, and where it is impossible to determine the damage, to the ecological funds which are under the management of the organs of protection of the natural environment.

In the first stage of the transitional period to a market economy (1991-1992), those economic levers and stimuli which can be used to take advantage of reserves to improve the ecological situation in the country without enlisting substantial expenditures should be used to the greatest possible extent.

The following must be done to accomplish this:

form a system of ecological restrictions and regulations of regimes of nature use by territories and ecosystems;

introduce payments for polluting the environment everywhere, using the experience accumulated in certain republics, oblasts, and cities of employing these fees during the large-scale economic experiment;

expand and refine the system of payments for natural resources and introduce licensing for nature use;

guarantee tax exemptions for part of the profits of enterprises directed toward realizing nature protection measures;

create a multilevel system of ecological funds (local, oblast, republic, and the RSFSR ecological funds);

maintain the system of state orders for realizing nature protection measures in ecological disaster zones and in regions with stressed ecological situations;

organize to attract foreign capital under preferential conditions in order to form additional financial resources for nature protection measures.

In the second stage, in 1992-1993, tax, credit, and depreciation policies will be improved in the direction of increasing market regulators of rational use of natural resources and environmental protection; this includes the following proposals:

create a buy-sell market for the right to discharge pollutants into the natural environment within established limits;

develop progressive standards for acceptable maximum discharge (or disposal) of pollutants for the basic technologies and types of production facilities;

establish special taxation of ecologically harmful output, as well as output produced using ecologically dangerous technologies;

create a multilevel system of insurance funds for protecting the environment to finance precautions and clean up the ecological consequences of serious accidents, catastrophes, and natural disasters;

employ preferential credit and subsidies for enterprises which effectively carry out the assignments of ecological programs;

introduce accelerated depreciation of nature protection objects and structures;

expand the compensatory (credit) form of financing nature protection measures from local, oblast, republic, and the Russian ecological funds.

The RSFSR government will ensure the following:

ratification in 1991 of a system for establishing ecological restrictions and regulations for regimes and licensing of nature use and payments for use of natural resources;

organization of qualified scientific-methodological and consultative aid to republic, kray, and oblast organs of management to introduce payments for discharging pollutants into the natural environment and creation of ecological funds;

development and delivery in 1991 to all republics, krays, and oblasts of the Russian Federation of methodological recommendations on setting payments for natural resources, licensing nature use, introducing a market for paid-for permits to discharge pollutants into the environment, and providing tax exemptions for profits of enterprises focused on financing nature protection measures;

determination, along with republic, kray, and oblast organs of management, of the base regions for conducting experiments to work up new elements of economic regulation of nature use and organize scientific support of this work with financing from the Russian Ecological Fund;

organization of dissemination of the experience of the base regions, extensive study, and consultation by specialists from other regions of the Russian Federation;

preparation in 1992 of normative-methodological documents to evaluate economic losses from accidental pollution of the natural environment, to create regional

insurance funds, and to tax ecologically dangerous technologies and production facilities.

The following must be done to ensure the effective work of the State Ecological Expert Examination Panel and increase its results in the period 1991-1993:

adopt a law on ecological expert examination which defines the legal status of the State Ecological Expert Examination Panel and ensures the legal defensibility of decisions adopted by the State Ecological Expert Examination Panel;

adopt a statute on the State Ecological Expert Examination Panel in the Center and locally; adopt a new procedure for paying nonstaff experts and members of the State Ecological Expert Examination Panel Council after envisioning substantially strengthening the system of organs of ecological expert examination with highly qualified specialists;

adopt a statute on paying nonstaff experts and members of the Expert Council;

establish a precise delineation of functions both among the subdivisions of the RSFSR State Committee for Protection of Nature's State Ecological Expert Examination Panel system as well as among other departments;

create a unified information base with computer support for all territories of the RSFSR with consideration of the background indicators of pollution of the natural environment and boundary conditions based on regional ecological, social, ethnic, and other features;

in order to increase the qualifications of associates of the RSFSR State Ecological Expert Examination Panel, envision that they are studied meaningfully in a special program and by a uniform methodology;

envision the creation of temporary scientific research collectives on a cost-accounting basis to develop normative methodological documents to regulate the activities of the expert examination organs and to work out the requirements for planning documents of future tasks of the socioeconomic development of the republics and particular regions of the RSFSR, with due regard for scientific-technical progress;

ensure a strengthened material-technical base and create a testing laboratory (a stationary one and a mobile one) to conduct control analysis in the process of expert examination and a data bank on nonstaff experts, scientific collectives, ecologically clean technologies and equipment, and other things.

The following are the basic tasks for refining the system of the State Ecological Inspection Office in 1991-1993:

creation and support of effective operation of the system of state monitoring of protection and rational use of natural resources on the basis of the interaction of all monitoring-inspection service offices in this field;

creation in the system of the RSFSR State Committee for Protection of Nature of an RSFSR state marine services office to ensure the protection, regulation, and monitoring of the use of the resources of territorial waters, the continental shelf of the RSFSR, and the offshore economic zone of the RSFSR which are republic property;

development and ratification of the Statute on State Control of Environmental Protection and Use of Natural Resources;

organization of the development and introduction into practice of a uniform system of normative-methodological support of the activities of the organs of state control in the field of ecology and nature use;

organization of the development, review, and establishment of norms of pollution of the natural environment and issuance of authorizations for the discharge or disposal of pollutants and use of nature;

regulation of the procedures for suspending or closing down the production activities of enterprises (or production facilities) for ecological reasons;

organization of development to produce modern monitoring and measuring equipment and supply it to the appropriate service offices of the nature protection organs;

creation of a network of stationary and mobile technical monitoring equipment for the sources of environmental pollution, including use of remote control and express methods;

creation of a monitoring system of the radiation-ecological situation on territories subjected to radioactive contamination as a result of the accident at the Chernobyl AES, as well as on territories adjacent to nuclear industry installations.

In order to link up the problems of ecology with practical solutions as soon as possible, use the intellectual and production potential of organizations and enterprises of the military-industrial complex to develop a Republic State Program—"Conversion—for Ecology." In the established manner set up a Directorate of this State Program by entrusting the following functions to it:

systemization and correlation of data on new technologies offered by the military-industrial complex for use in the economy in order to resolve ecological problems;

systemization and correlation of data on the tasks of the economy which may be performed using the potential of the military-industrial complex;

expert evaluation of the proposals of the military-industrial complex and placement and accompaniment of orders at enterprises of the economy with allocation of

start-up financing through the Directorate under conditions of compensation; the Directorate will use income from offering intermediary services as the main source of financing.

Given the lack of the RSFSR's own network of scientific research institutes and information services oriented to studying the problems of nature use and the environment, the following are paramount tasks:

exerting real influence on the formation of programs at research institutes of the USSR Academy of Sciences and Union ministries and departments, starting from the problems arising in practical management of nature use in the Russian Federation and organizing large-scale introduction of the results of this research;

providing organizational and financial support for scientific research of priority to the RSFSR through the capital of the federal budget and the Russian Ecological Fund;

forming our own scientific base by transferring scientific research and scientific information organizations to the subordination of the RSFSR and creating new ones;

coordinating scientific research being organized and financed by republic, oblast, and kray organs of management in order to utilize the capital most efficiently and publish and disseminate the results of this research;

closely cooperate with Union republics in the field of organizing scientific research and disseminating information on the problems of nature use and environmental protection.

In order to achieve these goals in 1991-1992, the following measures are to be carried out:

creation of an All-Russian Scientific Research Institute on Problems of Ecology and Nature Use and regional branches in the Russian Federation;

formation of a Coordinating Scientific-Technical Council of the Russian Federation on Problems of Nature Use with representatives of all republics, oblasts, and krays included in it;

organization of the publishing of a series of scientific-technical information manuals to be used by republic, oblast, and kray organs of management and control of nature use;

ratification of a statute on the procedure for financing scientific research and scientific information work from the RSFSR budget and the Russian Ecological Fund;

formulation and ratification, together with the Union republics, and initial realization of a program of applied scientific research and development on ecological problems.

An RSFSR state information system of collection, storage, systemization, and processing of ecological information is to be formed by 1995.

In 1992 the RSFSR government will ratify the procedure for ministries and departments and other organizations to provide information on the condition of the environment to the state ecological information system and the exchange of this information among interested state institutions and organizations.

Geographic information and cartographic support should be organized on two levels: the regional (or republic, oblast, kray, and so on) and the federal level.

On the regional level work to organize information support presupposes the creation in the base regions first of all of a state information system which in the initial stages would be oriented to use for studying the territories and the impact on them of subjects of economic activity, and then (as knowledge is accumulated in the state information systems)—to working up a mechanism for managing nature use in the region and a mechanism of interaction of the state information systems of the regional and federal levels.

Given the unstable financial-economic situation, the main goal of the Russian Federation's participation in interrepublic and international nature protection cooperation is more effective resolution of domestic ecological problems through integrating the capital of the Union republics, using the experience accumulated by the world community in managing nature use, and enlisting foreign intellectual, financial, and material resources.

The Russian Federation will strive to create a legal treaty basis for interrepublic nature protection cooperation and proposes that all Union republics develop and sign in 1991-1992 the following primary interrepublic documents:

a code of conduct in case of an accident at installations which threaten ecological catastrophe;

a code of conduct for volley-type pollution of internal waters and atmospheric air across borders;

an agreement to provide an evaluation of and compensation for damages done to the environment by all forms of anthropogenic impact and economic accountability for ecological offenses;

an agreement on the procedure for keeping records of natural resources and managing natural resource registration;

an agreement on specially protected natural territories and objects;

a code of conduct when there is mass destruction of plants and animals as a result of damages done to their habitat.

The RSFSR government will work on developing in 1991 a coordinated Union republic strategy of international nature protection cooperation and participation of sovereign republics in resolving regional and global

ecological problems. The directions of cooperation which are of priority to the Russian Federation should be reflected in this strategy.

In order to carry out the nature protection measures envisioned by this Program, the need for capital investments has been determined at 6-7 billion rubles [R] a year (as opposed to R1.9 billion in 1989); this is approximately 15-20 percent of the losses from pollution of the natural environment.

Conversions and termination of production in the defense complex should play an important role in covering this need for capital investments and for stabilizing the ecological situation in the republic. Reduction of military expenditures by only two percent would make it possible to use for nature protection needs an amount of capital comparable to current investments in environmental protection. This capital can be invested in enterprises and organizations of the military-industrial complex (MIC) to create new, more refined nature protection equipment and technology, as well as to set up ecological machine building. In order to accumulate the financial capital earmarked for resolving these problems and ensure its effective use, an Ecological Conversion Bank must be created; the Russian Republic Ecological Fund may be one of its founders.

The shortage of financial resources can be substantially lessened and the degradation of the environment reduced by changing export policy. Presently natural resources, and for the most part nonrenewable ones, account for the overwhelming part of the export potential, while a substantial part of the export receipts goes for acquiring foodstuffs and raw materials. The proportion of these purchases exceeds 16 percent a year. In this way there occurs a peculiar exchange of the most nonrenewable natural resources for easily reproduced raw material resources. Meanwhile, a substantial part of agricultural output and raw materials is lost, approximately 30 percent of gross production. From the standpoint of reducing the ecological burden and obtaining ecological benefit, it is much more efficient to eliminate losses of foodstuffs than to expand the extraction of fuel and energy resources and ores for forced export in order to stabilize the domestic foodstuff market. The latter requires ever greater expenditures and leads to serious ecological distortions.

There are enormous reserves for additional liberation of capital for environmental protection in the structural perestroyka of the economy on the basis of resource conservation and introduction of ecologically clean technologies.

The growth in extraction of primary raw materials for most types of natural resources must be stopped. The main share of capital investments should be directed to deep processing of raw materials, reduction of waste products, and improvement of the quality of final output.

The main source for financing measures to prevent environmental pollution and ensure rational use of natural resources is in-house capital of nature user enterprises. Realization of the measures of administrative-economic regulation of nature use envisioned by the Program, including tax exemptions for profits, loans, and subsidizing of nature protection activities, creates major stimuli for enterprises of all types of ownership to finance nature protection measures.

Tax exemptions should also be applied to territories which have been declared ecological disaster zones. In these zones all the profits of the enterprises should remain on this territory (without deductions into the republic and Union budgets).

An important role in resolving problems of ecology which are of federation-wide and interregional significance will belong to the Russian Republic Ecological Fund and the ecological funds of the republics, krays, and oblasts. These funds are formed through payments for polluting the environment and income from investment, banking, insurance, publishing, and other commercial activity.

In order to ensure nondepleting nature use, a Russian Fund for Protection and Reproduction of Natural Resources must be created which should be formed using payments for protecting and reproducing the corresponding natural resources included in the prime cost of the output; these payments must be used exclusively for these purposes.

In order to cover expenditures to prevent and clean up ecological consequences of natural disasters and serious accidents and catastrophes, it would be advisable to create an Insurance Fund for Environmental Protection which should be formed using enterprise insurance payments. The Russian Republic Ecological Fund may be one of its founders.

Introduction of changes in the organizational structure of management of nature use, including at the federal level, is a condition for effective realization of the State Ecological Program. Structural subdivisions responsible for organizing the performance of particular tasks and sections of the Program should be defined in the republic ministries and departments and above all in the committees of the ecology-resource bloc.

In order to coordinate the work of these subdivisions and analyze progress in realizing the Program and preparing the annual reports to the government and the Supreme Soviet of the RSFSR, it would be advisable to create a State Ecological Program Directorate within the RSFSR State Committee for Protection of Nature.

RSFSR Establishes State Counselor for Environment, Health

Presidential Order Approving Decree

925D0009A Moscow ROSSIYSKAYA GAZETA in Russian 15 Oct 91 p 2

[Order Approving the Decree, signed by Boris Yeltsin, president of the RSFSR: "Order of the President of the Russian Soviet Federated Socialist Republic on Approving the Decree on the State Counselor of the RSFSR for Ecology and Public Health and Its Service." The order is published under the rubric, "Official Section."]

[Text] 1. The attached decree on the state counselor of the RSFSR for ecology and public health and its service, and the general organizational structure of the service with 25 employees and a monthly salary funds of 32,780 rubles per month, is hereby approved.

A.V. Yablokov, the state counselor of the RSFSR for ecology and public health, will establish the service in accordance with this decree.

2. Providing the service of the state counselor of the RSFSR for ecology and public health with technical resources, as well as everyday needs and medical services for employees, will be the responsibility of the Administrative Department and relevant offices of the administration of the president of the RSFSR.

3. A fund will be established to pay for work carried out through agreements between the service and scientific and research organizations, as well as individual specialists, for providing expert opinions, examinations, and reports in accordance with the decree on the state counselor of the RSFSR for ecology and public health and its service, at 25,000 rubles per month.

[Signed] President of the RSFSR B. Yeltsin

7 October 1991

Decree on State Counselor

925D0009B Moscow ROSSIYSKAYA GAZETA in Russian 15 Oct 91 p 2

[Unsigned decree: "Decree on the State Counselor of the RSFSR for Ecology and Public Health and Its Service"]

[Text]

I. General Provisions

The state counselor of the RSFSR for ecology and public health is appointed by a decree of the president of the RSFSR, is subordinate to him, and is a member of the State Council of the president of the RSFSR.

Within his area of responsibility, the state counselor of the RSFSR for ecology and public health and his service executes the assignments given him by the president of the RSFSR, the vice-president of the RSFSR, and the state secretary of the RSFSR.

The state counselor of the RSFSR for ecology and public health:

develops proposals along conceptual lines of the policy of the RSFSR in the area of environmental protection, public health, and the ecological safety of the Russian federation, and secures agreement on the ecological policy of the RSFSR with other republics of the USSR, and other states;

prepares proposals on improving ecological legislation and increasing the effectiveness of state management in the area of ecology, utilization of nature, and public health;

organizes the development of state programs and of resolutions from the president of the RSFSR in the area of ecology and public health;

secures the cooperation of the president of the RSFSR with leaders of international organizations, foreign states, union republics, and the union of SSR on issues dealing with ecological safety, environmental protection, efficient utilization of nature, and the health of the population.

II. Authority Vested in the State Counselor of the RSFSR for Ecology and Public Health

The state counselor of the RSFSR for ecology and public health, in the fulfillment of his functions, is empowered to:

present to the president of the RSFSR proposals along conceptual lines on the policy of the RSFSR in the area of environmental protection and the health of the population, as well as the ecological safety of the Russian federation;

organize the preparation of, and presentation to the president of the RSFSR, draft laws, decrees, and other standard documents on issues of ecology and public health;

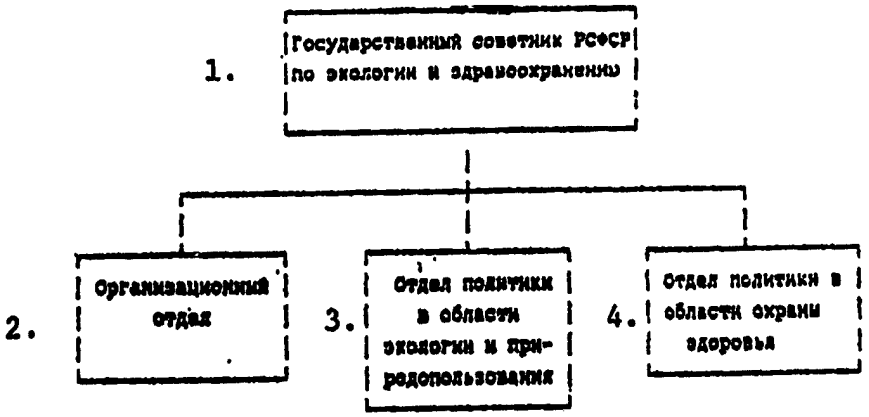
control the implementation of decisions made by the president of the RSFSR on issues of ecology and public health, to be carried out by the executive organs of administration, and inform the State Council of the president of the RSFSR about work progress in these fields;

analyze and summarize work done by executive organs of administration on the territory of the RSFSR on their immediate implementation of legislation in the areas of environmental protection and public health;

organize the compilation of an annual state report on the status of the environment and the health of the population of Russia;

implement the consultative advice of the president of the RSFSR on issues of ecology and health protection;

OVERALL ORGANIZATION of the Service of the State Counselor of the RSFSR for Ecology and Public Health



Key: 1. State Counselor of the RSFSR for Ecology and Public Health, 2. Organizational Department, 3. Policy Department on Ecology and Use of Nature, 4. Policy Department for Health Protection

receive and validate draft decrees and orders of the president of the RSFSR which are relevant to ecological and public health issues;

request and receive from state and other organs, enterprises, institutions, and organizations, including foreign entities operating on the territory of the RSFSR, all necessary information on issues of the efficient use of natural resources, preservation of nature, and the health of the population;

attract employees of relevant state and other organizations and their subordinate offices, to establish councils of experts and groups of specialists, including foreign personnel;

make recommendations to state administrative organs, republic executive authorities within the RSFSR, krays, oblasts, autonomous entities, the cities of Moscow and St. Petersburg, as well as to organizations subordinate to the union, on having their activities coincide with the state policy in the areas of ecology and public health;

listen to reports from heads of ministries and departments, local executive organs of authority, institutions, and organizations on issues of ecology and public health;

on instruction of the president of the RSFSR, provide official interpretations of decisions made by the president of the RSFSR in the areas of ecology and public health;

coordinate activities on issues of environmental protection, health of the population, and efficient use of natural resources with state organizations of the Union of SSR and union republics;

participate, with right of a deliberative vote, in meetings of the Council of Ministers of the RSFSR, Council for Federation and Territorial Affairs, Security Council of the RSFSR, and other organs established by the president of the RSFSR, as well as attend sessions of the RSFSR Supreme Soviet, its committees and commissions;

analyze and summarize foreign management experience and trends in international cooperation in the areas of ecology and public health;

exercise additional authority on orders from the president of the RSFSR.

III. Establishment and Duties of the Service of the State Counselor of the RSFSR for Ecology and Public Health

The service of the state counselor of the RSFSR for ecology and public health is charged with assuring that the charter given the state counselor of the RSFSR is complied with. The Service operates in accordance with this decree and with decrees on organizationally subordinate offices of the service approved by the state counselor of the RSFSR in agreement with the director of administration of the president of the RSFSR. Employees of the service perform their functions in accordance with duty instructions approved by the state counselor of the RSFSR.

The service, in its operations, is directly subordinate to the state counselor of the RSFSR for ecology and public health.

The organizational structure and staff of the service are approved by the state counselor of the RSFSR within the framework established by the president of the RSFSR with regard to the number of employees and the salary fund of the service.

The state counselor of the RSFSR for ecology and public health has the authority to establish the service on a contractual basis, to determine the salaries of each

specialist within the limits of the salary fund as approved by the president of the RSFSR, and to issue directives to the service.

Surplus money in the salary fund, as a result of economizing, may be used by the state counselor of the RSFSR as incentive pay to department directors and specialists of the service.

Information services for the state counselor of the RSFSR and his service will be provided by the Information Analysis Center of the administration of the president of the RSFSR.

Financial activities of the service, including currency transactions, are provided for by a separate line item in the estimate of expenditures of the administration of the president of the RSFSR and approved by the president of the RSFSR. The state counselor of the RSFSR will manage credit payments within the total sum approved by the president of the RSFSR and he has the authority to sign financial documents.

The state counselor of the RSFSR is authorized to use financial resources for concluding agreements with scientific and research organizations, as well as with specialists, in order to pay for their expertise in executing draft programs, special scientific research projects, and compilation of analytical obervations and other documentation necessary for implementing the functions of the state counselor of the RSFSR and his service.

USSR 'Map of Radioactive Catastrophes' Nears Completion

92WN0102A Moscow NEZAVISIMAYA GAZETA in Russian 23 Oct 91 pp 1, 6

[Interview with People's Deputy Aleksandr Penyagin, chairman of the USSR Supreme Soviet subcommittee on nuclear ecology, by Aleksandr Putko; place and date not given: "In the USSR There Is No Concept for Dealing With Dangerous Nuclear Waste"]

[Text] **Deputy Aleksandr Penyagin Is Compiling a Map of Radioactive Catastrophes in the Country**

Have you ever seen a map of the country that showed the radiation situation? For example, zones in which it is quite impossible to live because the background radiation is higher than 40 curies per square kilometer, all shown in red? Or the broader green spots (from 15 curies to 40 curies), areas not quite as dangerous but from which it is better to depart? The territory colored yellow is another matter: According to existing law in Russia, the Ukraine, and Belorussia it is permitted to live there. But with the agreement of people who are willing to risk their health for the sake of the money offered to them as compensation.

This same map shows the sites of the major accidents, indicating the dates and scales of the disasters, along with burial sites for spent nuclear reactors, radioactive waste, and instruments and drugs containing isotopes. Here, too, it is possible to see the regions where uranium is extracted and processed, the mooring places for nuclear submarines, and the sites where nuclear weapons testing has taken place. I saw it with my own eyes in the USSR Supreme Soviet Ecology Committee.

It was compiled by People's Deputy Aleksandr Nikolayevich Penyagin, chairman of the subcommittee on nuclear ecology. Of course, in this work, which has been going on for two years, he has been helped by other people's deputies, scientists, the military, and people at many enterprises and sites. Data from pictures taken in space have been used.

The work is not yet complete. It will be refined, there will be new data, but it must be assumed that the overall picture will change only for the worse. And even without this, the picture is appalling. A.N. Penyagin himself believes that if we do not properly assess the situation and start to take steps, we can expect a global catastrophe in the not too distant future.

[Penyagin] In July 1989 our committee was assigned the task of conducting an in-depth study of the consequences of the Chernobyl accident. It was then that we compiled the first maps of the regions contaminated with cesium-1376 [as published], strontium-90 and plutonium. The time during which these radionuclides affect living organisms varies. For example, strontium and cesium are dangerous for 150 to 200 years after an accident, while for plutonium the half-life is 24,000 years! Thus, the 30-kilometer zone around Chernobyl is for all practical purposes wasteland for mankind forever.

The first conclusion, that we reached immediately, is that it is essential to investigate the overall situation in the country. Because we had accidents involving the ejection of radiation even before Chernobyl. In particular, in Chelyabinsk Oblast at the Mayak Production Association, where weapons-grade plutonium has been produced since 1948 (this is what we call plutonium that is more pure and more suitable for the manufacture of nuclear weapons). According to our data, there have been three accidents there, as the result of which about half a million people received large doses of radiation. The situation there now is particularly acute: An enormous quantity of radioactive waste has been accumulated, including radioactive water. Entire lakes—about half a million cubic meters of radioactive water. We took measurements there in the region of the settlement of Muslyumovo. The figure for the air is 693 microroentgens, while on the banks of the Techa River it is up to 1,500. And this when the maximum permissible standards are 12-15 microroentgens!

And what about losses of nuclear reactors from space? And the dumping of radioactive waste into rivers? And the numerous "tailings" from those places where we began extracting uranium starting in forties?

[Putko] What are these "tailings"?

[Penyagin] This is what specialists call ore with a low uranium content. This portion of the ore extracted does not have much use for processing. It is left on the surface. It is then washed down by rain and carried into rivers, and enters various products. You see the green triangles on the map? These are sites where ore has been recovered, for example, in Chita Oblast, in Kirghizia, in the Urals, in Uzbekistan, and in the Ukraine. "Tailings" have been left everywhere. The radiation situation has been neglected, and no re-cultivation has been carried out on territories after the uranium has been extracted. People are falling ill but know little of the causes of their suffering.

[Putko] I see black rectangles on the map.

[Penyagin] These are radioactive waste burial sites. They are located all across the territory—in the Far East, the Baykal region, Central Asia... And here, we have a burial site near Moscow, close to the suburb of Sergiyeva.

An enormous quantity of radioactive waste is being formed in the military-industrial complex. During the period 1949 through 1956 waste from Chelyabinsk-65 was poured into the Ob River. Whereas initially the mass of radioactive waste moved as far as the Kara Sea, now it is contaminating the upper reaches of the Ob basin. An underground lens of radioactive water has been formed. A total of 124,000 people have been affected in this region along the Techa River.

[Putko] Do we have any laws, any concept for resolving this problem?

[Penyagin] There is no law and no concept. And the problem, as you can readily understand, is growing with catastrophic speed. Because the existing reactors are wearing out but are still being operated, the useful life of some nuclear power stations is coming to an end, and uranium is still being extracted and processed, including here near Moscow. The situation with respect to radioactive waste is alarming and obviously very expensive. There is already nowhere to put the waste from many enterprises.

Our naval fleet is in crisis. Incidentally, I served aboard a nuclear submarine and so I am especially aware of the situation here. Dozens of decommissioned submarines have been laid up. It is not known what to do next. For they contain nuclear engines. After a nuclear submarine has served its allotted 25 years, the nuclear innards of the reactor should be removed. This is understood. But what to do with it next—bury it or store it?

What will we do next with the dangerous waste—bury it more deeply or organize storage somewhere? Meanwhile, we are doing both. And, of course, without the necessary precautions, haphazardly, uncontrolled. We cannot guess how buried waste will behave, where underground water will take it, and how that will affect the soil and the plant and animal worlds and ultimately the health of our children and grandchildren. We are still trying to reduce the number of nuclear submarines. But what will be done with the reactors and the spent nuclear fuel?

And the main factor is that the unwound flywheel of the military-industrial complex has not been stopped. We have agreed to reduce the number of warheads but we are unable to think about a planned halting of the gigantic machine that continues to create deadly weapons. The madness goes on. This is why, when agreeing to reduce the arsenals of nuclear weapons we must at the same time raise the question of the cost of dismantling the enterprises that produce them. Specifically, they are themselves dangerous from the standpoint of radiation.

We do not even have a state mechanism to control their activity. At one time the USSR State Committee for Safety in the Atomic Power Industry tried to extend its control powers to the Ministry of Defense and the Ministry of Atomic Power Engineering and Industry to that part that it was customary to refer to as the "defense people." It was not permitted.

[Putko] So there is no hope, no ray of light?

[Penyagin] If there were no hope I would not be compiling this map. I am sure that we will pass a law on the utilization of nuclear energy, and nuclear and radiation safety. There have also been other advances. In 1989 the USSR Supreme Soviet passed a resolution stating that everything relating to ecological information should be declassified. Regardless of whether the production involved is nuclear, chemical, or anything else. Of course, this is only a beginning. The enterprises of the military-industrial complex are still surrounded by very high fences, but I hope that during the course of the reform of the military they will be brought within a legal framework.

There is no doubt that the difficulties in resolving all our problems are being exacerbated by the political situation in the country. For now they must be resolved by the independent republics. Will they agree to coordinate their actions? In any event, much is already being done in Russia. The Ministry of Atomic Power and Industry has made an inventory of most objects and has taken under advisement a draft sector program on radioactive waste. But I am convinced that only together, through the efforts of all the sovereign republics, will we be able to achieve success. For if you look at our map you will see that we all now find ourselves in the same crisis situation.

[Putko] Do you intend to publish the map?

[Penyagin] As soon as the work on it has been completed I will try to do that. Moreover, I would very much like similar maps to be compiled in all countries that possess nuclear weapons and nuclear technology, so that it will be possible to weigh these maps together and see where we are today. The nuclear danger knows no borders. Our submarine, the Komsomolets, lies in an area where fishermen from various countries cast their nets, and a

number of our regions have suffered from radiation emanating from the Chinese nuclear test site in Xingjiang. Radioactive dumping in the world's oceans and destroyed reactors falling back to Earth from space are equally dangerous to everyone.

American Firms Sign Chernobyl Protocol

92WN0060A Kiev PRAVDA UKRAINY in Russian 9 Oct 91 p 3

[Interview with Harry A. Dunbar, president of Los Alamos Technical Associates, conducted by Yuriy Ovsyannikov, PRAVDA UKRAINY correspondent: "How Can Chernobyl Be Helped?—This Was the Topic of Discussion by Representatives of the U.S. Companies LATA and FEE During Their Visit to the Ukraine"]

[Text] Kiev and Chernobyl have been visited by a specialized delegation from the United States. It was comprised of experts from the firm Los Alamos Technical Associates [LATA] (which deals with nuclear power problems and in particular with cleanup of environmental pollution caused by emissions of radioactive nuclides and toxic elements) and from Far East Environment [FEE] (financial and technical experts on ecological projects and jobs). Though representing LATA and FEE, the Americans reported that their mission in the Ukraine was also on behalf of specialized divisions of a number of other U.S. companies such as Lockheed, Environmental Surveillance Associates, Bechtel International and Westinghouse.

That is a brief look at the visitors' "calling card." The Ukrainian side in the 10 days of consultations and negotiations was represented by officials from the Ministry for Protection of the Public From the Effects of the Chernobyl Nuclear Accident and republic Academy of Science institutions.

Now about the results. The main outcome of the series of business contacts was the signing of a joint "Protocol of Intent" by both sides. Georgiy Aleksandrovich Gotovits, who is head of the Ukrainian Ministry for Protection of the Public From the Effects of the Chernobyl Nuclear Plant Accident, said adoption of the document which was signed marked an important organizational stage. He added:

"It is important in terms of future undertakings. And for the future development of comprehensive projects to solve urgent Chernobyl-related problems together with specialists from Los Alamos and other qualified firms and institutions in the United States."

More detailed assessments and predictions in this regard were made by Harry A. Dunbar, president of LATA, during a conversation with our correspondent. Specifically, here is what he said:

[Dunbar] We are satisfied with our visit to the Ukraine, the purpose of which was to concretize to a certain extent what Chernobyl needs. The joint protocol of intent which was adopted sets forth a strategy of necessary measures and actions. And I hope that in the not-too-distant future these can be realized on a contractual basis.

The document refers to the possibility of using services and technologies from the United States in the Chernobyl area. There are plans to conduct a broad spectrum of joint work and studies. These will include, for instance, various types of decontamination, building of radioactive waste storage facilities which meet international standards, efforts to ensure the complete safety of the concrete "sarcophagus"-encased fourth reactor unit of the Chernobyl Nuclear Power Plant and its fuel-containing masses...

[Dunbar] The aforementioned areas should be precisely combined with a program for physical and technical supply to back up the appropriate work and with calculation of financial outlays and possible ways of compensating for them.

[Ovsyannikov] I have heard that the American side initiated efforts to set specific time limits for realization of specific measures...

[Dunbar] We do not intend to force events. But neither do we intend to waste time. LATA and FEE experts will present our version of a proposed contract to the Ministry for Protection of the Public From the Effects of the Chernobyl Nuclear Accident by 1 November of this year. By 15 November at the latest we will submit an assessment of the total economic effect which could result for the Ukraine as a result of the purposeful pooling of both sides' technical capabilities and experience.

[Ovsyannikov] You have talked about the possibility of using modern American technologies here. But might it be the case that at least some of them would in one way or another fall under an export ban as "strategic" technologies according to the guidelines issued by the still existent Coordinating Committee for Multilateral Export Control (COCOM)? The socialist countries as previously defined no longer exist. Yet unless I am mistaken COCOM restrictions on exporting a number of goods and technologies remain in force for our country.

[Dunbar] I do not believe that in this case the difficulties to which you refer would arise. On the contrary, I should underscore Americans' great interest in cooperation with you and in helping the people of the Ukraine, within whose territory this unprecedented accident occurred. Of course, I could be mistaken about some aspect of this. But I reiterate that in this situation both LATA and FEE and others of our companies which are studying the Ukraine's problems have every reason to count on the sympathy and support of the American people and government.

Incidentally, also encouraging is the fact that your country has undertaken serious efforts to meet foreign entrepreneurship halfway.

[Ovsyannikov] You have visited the 30-km zone around Chernobyl... What, in your opinion, is the most promising and preferable option, for instance, for solving the problems of the "sarcophagus," that concrete monster?

[Dunbar] Yes, that is a very difficult problem. The goal is to ensure 100-percent safety in the destroyed unit both in nuclear and in radioactive terms. I would prefer not to go into details and concepts here. Much could be decided with regard to those in our next round of talks with Ukrainian specialists. The basic selection criteria are clear: the ecological acceptability of any work on the "sarcophagus" or in its vicinity, and guarantees of a safe final burial.

American companies have both the specialists and the equipment to do that in an appropriate manner.

[Ovsyannikov] In that connection I would like to your opinion of the idea of an international competition on the "sarcophagus."

[Dunbar] That was precisely the idea expressed in the joint "Protocol of Intent" with the Ukrainian side. It would be appropriate for the future of the "sarcophagus," one of the key sites in the "zone," to be decided precisely by means of an international competition between alternative plans.

Reactor Safety Expert on Chernobyl Problems

AU2810205391 Hamburg DER SPIEGEL in German 28 Oct 91 pp 72-77

[Interview with nuclear physicist Adolf Birkhofer, managing director of the Reactor Safety Society in Garching, by an unidentified reporter; place and date not given: "It Will Be Very Expensive"]

[Text] [DER SPIEGEL] Professor Birkhofer, when you were in Chernobyl last week together with the German environment minister, Mr. Toepfer demanded that the three reactors that are still working be closed down immediately. This demand was also made five years ago, immediately after the accident. What has been done in the meantime?

[Birkhofer] The cause of the Chernobyl accident was an eruption of power, with which the reactor destroyed itself. The physical qualities of the remaining reactors were, according to the Soviets, modified in such a way that such an eruption of power cannot happen again. The enrichment of the fuel with uranium 235 was increased, and the absorbing rods for binding neutrons were reinforced.

[DER SPIEGEL] Does this apply only to the three reactors in Chernobyl?

[Birkhofer] This goes for all 16 RBMK reactors of the Chernobyl type; in addition, the time for closing down the reactors in case of an accident, which was about 20 seconds before the accident, has been reduced considerably.

[DER SPIEGEL] Is the demand for closing down unjustified?

[Birkhofer] I only listed what has been done. Fire protection has not been improved. Only recently did it become obvious again that a fire can easily start there. The safety installations, too, have not been improved to the necessary extent. The reactor system in the old RMBK types is only intended for coping with breaks in thin pipes. In the more recent types the break of the thickest pipe is counteracted by a pressure reduction system. However, this equipment cannot be installed in the old reactors. Above all, the RMBK reactors do not have safety containment; radioactivity that is released during an accident can thus not be effectively contained.

[DER SPIEGEL] Were you briefed about these improvements by your Soviet colleagues and also about still existing weak points, or do you think that there were things they did not tell you?

[Birkhofer] After the Chernobyl accident the Soviets at first talked to us only about new reactor concepts. Since about 1989 this has changed. Only when we made our safety analysis for Greifswald, did we receive information about accidents about which we had never heard anything. Now we know that there were at least two serious RBMK accidents, one in Leningrad and a second one in Unit One in Chernobyl.

[DER SPIEGEL] Have Western experts meanwhile developed ideas about how the problem of Chernobyl can be solved in a lasting manner?

[Birkhofer] The sarcophagus around the disaster reactor was built in 1986 under very difficult conditions. Its quality does not correspond to the necessary standards. The roof leaks, for instance, which is very unpleasant. The solidified slag from the molten core forms dust. This dust is currently being bound by the injection of water. However, this can only be an interim solution, because the radiating dust might reach the outside under adverse conditions.

[DER SPIEGEL] There are experts who do not want to rule out a rupture in the sarcophagus.

[Birkhofer] I do not see this danger at the moment. However, the entire concrete structure must be monitored continuously. The cover of the reactor, for instance, weights about 2,000 tonnes and on top there are another 1,000 tonnes of material that was dropped on it. It is lop-sided, cannot be stabilized lastingly, and might crash down because of its own weight and destroy parts of the sarcophagus.

[DER SPIEGEL] What have Western experts, who have obviously known about this problem for some time, done in the meantime?

[Birkhofer] Nothing so far, absolutely nothing. They are waiting for a status report, in which the Soviets want to describe the condition of the sarcophagus and list the

monitoring measures that have been taken so far. However, the entire scope of the problem has been known only for a relatively short time.

[DER SPIEGEL] Five and a half years after the most serious accident in the history of civilian power plants such a status report is rather late.

[Birkhofer] Yes, that is true, but sophisticated exploration work was necessary. Now the Soviets want to ask for Western help for constructive solutions. There are considerations to build a new concrete cover or to fill the entire building with concrete.

[DER SPIEGEL] Would filling the building with concrete be a solution?

[Birkhofer] It may be one, but not a good one. As long as it is not known exactly where the ejected fuel is and as long as this fuel still radiates intensively, filling the building with concrete cannot be a lasting solution.

[DER SPIEGEL] Thus, the Soviets do not know what the reactor looks like on the inside?

[Birkhofer] They obviously do not know everything; it is still unclear where about 30 tonnes of fuel are.

[DER SPIEGEL] Somebody must go into the sarcophagus to find it?

[Birkhofer] No, radiation there is too high. Holes are being drilled from behind shields, through which measuring instruments and television cameras can then be inserted.

[DER SPIEGEL] Must all RBMK reactors be closed down?

[Birkhofer] The six older ones should be closed down very soon. However, there are Soviet experts who consider RBMK reactors safe in their current condition. That is one of the reasons why I was able only half a year ago to make the Soviets agree to an international safety analysis of the more recent RBMK reactors.

[DER SPIEGEL] Soviet engineers believe that the RBMK types could be reequipped with Western technology. Are there any considerations in this respect in the West?

[Birkhofer] I do not know any Western company that has thought about that.

[DER SPIEGEL] Would reequipment be economically useful?

[Birkhofer] Hardly. If one wants to bring these reactors up to Western safety standards, one will have to do very much, among other things, build safety containments; it will be very expensive and absolutely useless in economic terms.

[DER SPIEGEL] Should the Soviets order Western nuclear power plants instead?

[Birkhofer] I cannot speak for industry, but as a safety expert I prefer very much new reactors to be built over reequipping old reactors only in part.

[DER SPIEGEL] Do the Eastern pressure water reactors of the WWER type at least correspond to Western safety standards now?

[Birkhofer] No. The 10 power plants of the old WWER type, such as the one in Greifswald, for instance, show grave safety defects. They, do not have a safety containment, either, and only breaks in pipes with a diameter of up to 32 millimeters can be coped with. Fire protection, must be improved, too.

[DER SPIEGEL] To what extent can the WWER reactors be reequipped?

[Birkhofer] At least the new reactors could be brought up to Western standards. They can be reequipped, for instance, with new instruments and better measuring and information technology. The old reactors should be put into service only for a limited period even after temporary closing down and reequipment.

[DER SPIEGEL] How can one help the Soviet nuclear power industry?

[Birkhofer] In particular, we must show the Soviets how they can help themselves, for instance through better training of the operating personnel.

[DER SPIEGEL] Can the Soviets do without Western material aid?

[Birkhofer] The Soviets can certainly improve a number of technical installations with their own means; one just has to show them what to do. However, from the West they need instruments for processing measurements and sensors that discover and report leakages, for example. In addition, bad quality pipe systems must be replaced with others.

[DER SPIEGEL] Any kind of reequipment is expensive; are there any cost estimates?

[Birkhofer] There are gross estimates by the European industry. According to these estimates, the very old reactors, which cannot be reequipped economically for long-term usage, can be made usable for about five years, if they are absolutely necessary, with an expenditure of 100 million German marks [DM] per reactor.

The newer reactors could be made safe for a longer operating period for DM200 to DM300 million per reactor, the big modern WWER types for about DM200 million per reactor—all in all, DM10 to DM12 billion have to be expected. However, a considerable part of the payments can be channeled back to the countries of origin.

[DER SPIEGEL] Who is supposed to pay the rest?:

[Birkhofer] There are considerations to finance this via loans from international banks, which can be paid back

later from the revenues gained by selling electricity. Minister Toepfer is trying to achieve a common effort by the big industrialized countries in this respect.

[DER SPIEGEL] In addition, there are the costs for a lasting isolation of the steadily radiating disaster reactor of Chernobyl in its unserviceable sarcophagus.

[Birkhofer] Estimating the costs for that is currently beyond my imagination.

IZVESTIYA Hits Chernobyl Commission Findings

PM0411114391 Moscow IZVESTIYA in Russian 29 Oct 91 Union Edition p 2

[Yu. Rogozhin report: "What Happened at Chernobyl 11 October? Government Commission Findings and Our Commentary"]

[Text] Chernobyl-Moscow—It all started just the way it did in April 1986, when, during a shutdown procedure, one of the turbogenerators continued to spin through inertia after steam supply to the turbine blades had been cut off. This previously happened at Power Unit No. 4, this time it was No. 2.

Here is how A. Mazalov, a member of the Ukrainian Republic's government commission investigating the consequences of the accident at the Chernobyl AES [nuclear electric power station] and chief of a main administration at the USSR State Committee for Safety in Industry and Atomic Power Industry [Gospromatomnadzor], described the chain of events:

"When the turbogenerator had almost stopped spinning, it was suddenly and unexpectedly switched into the energy system. And the generator started spinning again, operating inadmissibly as an induction motor—in other words, not generating electricity, but consuming it to turn the turbogenerator. The huge electrothermodynamic loads destroyed the generator's sealant bearings. Hydrogen and turbine oil entered the machine room under pressure, forming a combustible mixture which ignited with the characteristic explosion of a fulminating mixture. Two mighty tongues of flame like gas jets rapidly engulfed the metal structures supporting the machine room roof until they lost their load-bearing ability, which led to the roof's collapse..."

The rest is well known. Rapid and effective action by the personnel prevented any danger of the fire's spreading to the entire machine room or to buildings housing electric equipment. Nonetheless, the economic damage exceeds several tens of millions of rubles. Despite this, the accident was initially described by the Ministry of Atomic Power Engineering and Industry as an..."insignificant incident." It was only under commission pressure that it was termed a "medium-level incident."

Just what caused the accident?

The event which triggered the accident was the unplanned switch-on of a high-voltage switch located hundreds of meters from the machine room in an open area of network distribution equipment. The question was: Why did the switch operate? Initially, operator error was not ruled out.

The experts' conclusion unambiguously claims that the direct cause of the accident was the shorting of electric wires owing to damage to the insulation around the compound cable linking the generator with the open distribution equipment.

A. Mazalov continues:

"In this highly complex and rapidly evolving situation the operational personnel's main actions were correct. At the same time, substantial shortcomings should be noted in the personnel's collaboration with the fire fighters. Errors in managing the unit shutdown process led to serious damage being done to another turbogenerator and to a dangerous drop in water level in one of the coolant system elements. The fire fighters acted skillfully and highly professionally. This made it possible to localize and then put out the fire quite quickly..."

I would like to add to this that the government commission did not set itself the task of making a detailed analysis of the general state of technical security or of the sociopsychological climate at the Chernobyl AES. It is understandable that both these factors could have created the preconditions for accidents to occur.

The USSR Gospromatomnadzor has repeatedly stated that power-generating units with first-generation high-power pressure-tube reactors do not meet modern safety standards. To avoid the serious consequences of any accidents the committee decided to limit their capacity—and it is now more than a year that Units 1 and 2 at the Chernobyl AES have been operating at less than 70 percent of their rated capacity.

The sociopsychological situation in and around the Chernobyl AES requires a separate discussion. Only a handful of veterans who worked there before 1986 remain at the station. They have been replaced by a lot of people from other AES's and thermal stations who handled different equipment there. This partial replacement of personnel has complicated the formation of a cohesive collective. One other reason for the psychological tension at the Chernobyl AES is to be found in the unclear prospects for its workers and their concern about the fate of their families.

This is what happens. After ending work, the operational personnel at the Chernobyl AES have to change clothes three times before going home to Slavutich. The paradox is that they are still entering contaminated territory. Slavutich, which was conceived as a resettlement village for the families of Chernobyl AES workers after the previous disaster, is sited on a...radiation hot spot.

What is the way out of this dead end? Should we, indeed, close down the Chernobyl AES as quickly as possible? But... But the fixed capital at the Chernobyl AES is worth more than a billion rubles [R]. Add to this the R500 million of capital investment in Slavutich and the cost of the agricultural produce lost from the land covered by the Chernobyl zone. Let us not forget that the Chernobyl AES currently saves us almost 20,000 carloads of fuel oil which would have to be shipped in to the Ukraine every year. These figures force us to seek a serious decision.

Certain specialists are proposing another option. Yes, we need to shut something down—not the Chernobyl station but the power units currently being used there. Above all, the first two units, whose design is obsolete. But this should only be done when the difficult power generation situation in the region allows. In order to defuse this situation we need to urgently begin work and start construction as quickly as possible at the Chernobyl AES site on new power units with safer reactors. Specialists are convinced that foreign firms, which have stated their desire to modernize our power-generating capacity but have so far failed to find any prestige projects where they could invest their capital, could be attracted to planning and building these new units.

All this will take several years. But the public is already entitled to demand a normal level of safety. To this end the measures drawn up (back in 1986!) for modernizing high-power pressure-tube reactors should be finally implemented in full. And (this is probably the most important point) the leaders of the Chernobyl zone and the Ministry of Atomic Power Engineering and Industry should draw up and implement measures to improve the ecological situation in Slavutich and the sociopsychological climate at the station.

...The former heroic days of building and commissioning the Chernobyl AES ended in disaster. The days of emergency work led to the recent accident. Is that enough? It is time to organize normal work at Chernobyl.

UN Aid Sought in Chernobyl Shutdown

92UN0282A Moscow IZVESTIYA in Russian 31 Oct 91 p 1

[S. Tsikora report: "The Final Page of the Chernobyl Story"]

[Text] After the fire at the nuclear power station on 11 October 1991 the power station was morally doomed. But resolution of this question has in practice caused considerable difficulties, both technical and economic. They pertain primarily to the lack of reserve capacities that could fill the "energy gap" that is opening up with the closure of the Chernobyl nuclear power station.

Despite grim reality, the parliament of the Ukraine has passed a resolution stating that the No. 2 unit should be "shut down and an immediate start made to decommission it." The same fate awaits the No. 1 unit and the No 3. unit. It has been decided to shut them down "in the minimum possible time allowed by technical considerations, but in any case not later than 1993, with their subsequent decommission."

Simultaneously with the resolution on shutting down the Chernobyl nuclear power station the republic parliament adopted an appeal of the Ukrainian Supreme Soviet to the United Nations. This states specifically, "The extraordinary complexity of the scientific and technical problems and the total lack of world experience in shutting down nuclear power stations and burying spent fuel, and also the economic difficulties, do not allow the Ukraine to resolve this problem independently and are forcing it to appeal to the United Nations and the governments of the world's countries for help."

Problems Associated With Chernobyl Shutdown

92UN0282B Moscow IZVESTIYA in Russian 1 Nov 91 Union Edition p 3

[A. Illesh report: "Will Chernobyl's Problems Also Be Laid to Rest Along With Chernobyl?"]

[Text] The Ukrainian parliament has decided to shut down the Chernobyl nuclear power station. We reported this briefly in a previous issue of the newspaper. A revolutionary decision: No nuclear objects of such large capacity and complexity on the country's territory have ever been shut down. And, assuming that it cannot cope with this alone, the Ukrainian Supreme Soviet has appealed to the United Nations, asking it to act as a sponsor in setting up a scientific and technical program to decommission the nuclear power station.

So even the Ukrainian legislators recognize that they cannot get by without some advice, and skilled advice at that. Where will the money, significant amounts, come from to dismantle the Chernobyl nuclear power station? The solution here is known: Ask for it from abroad. From whom? Why, from the United Nations. And the appeal contains lines that make it clear that they expect from the United Nations the creation (under its aegis) of a special fund just for this action.

So what makes the parliamentarians so sure that their appeal will not go unanswered. "The recent fire (I quote TASS) evoked a sharply negative reaction among the world public, and raised the question of the immediate closure of the station, even though it was initially being proposed that this be done only in 1995."

The parliamentary appeals emphasizes that realization of the "Chernobyl" program by leading companies in the world on a competitive basis would make it possible to resolve the complicated scientific and technical tasks at Chernobyl with respect to destroying the "sarcophagus"—the most dangerous object there. A report from Bonn shows that there is concern in the West about the situation at Soviet nuclear power stations, and rightly so. This concern was expressed, in particular, by the federal minister for the environment, nature conservation, and reactor safety, Klaus Toepfer. He also stated that in the

long term it will be necessary to shut down all 16 Soviet RBMK reactors, and he pointed to the need to initiate major international action to provide urgent help for nuclear power engineering. But... "because of financial considerations Germany is unable to provide that help independently," he admitted.

Now, a report from Paris. Our own correspondent, Yu. Kovalenko, reports that two French companies—ATN and Lafarge Fondue Internationale—have devised a plan to neutralize the "nuclear monster" at Chernobyl. We are talking about the sarcophagus. They submitted this plan to the Ukrainian authorities early in September.

The essence of the plan is as follows. At the time of the explosion in 1986 the reactor lid, weighing about 1,000 tons, was torn off and is now prevented from falling only by the interlacement of pipes and tubes on which it hangs. And if this interlacement collapses a cloud of radioactive dust will be raised that could extend beyond the boundaries of the nuclear power station. An even greater risk is associated with the fact that, as the nuclear people in Paris believe, the Chernobyl nuclear power station is resting on a concrete slab that was seriously damaged by the explosion. Numerous particles are being washed through the cracks in that slab by the rain and are entering the soil. If the reactor lid does fall, those particles may reach the water table and then pass into the Pripyat River... But this danger can be prevented. The French plan consists of creating a slab 8 to 10 meters thick beneath the reactor. "After that," the leader of the project, engineer Andre Legleye [name as transliterated] notes, "it will be necessary to fill the central part of the reactor with concrete and thus form a block with its lid."

And here we have the "but"... There has been no follow up at all to this proposal in the Ukraine. I can assure readers that this kind of "readiness" for international contacts is just the usual day-to-day thing with respect to Chernobyl, when political statements are considered to be much more weighty than the daily, painstaking, and technically complex resolution of questions that arise daily in the zone, at the station, and in Slavutich city.

This kind of work will soon be increasing sharply, whether we like it or not. And throughout the entire republic. Our correspondent S. Tsikora has reported that in order to close the "energy gap" in its national economy following the shutdown of the Chernobyl nuclear power station, the Ukraine intends to construct in a very short time—just one year—a regional power station at Chigirin, equipped with steam-gas generators [parogazovyye ustanovki]. (The parliament preferred this plan to a proposal from the Ukrainian Cabinet of Ministers to start up new units at other nuclear power stations in the republic).

As I understand it, a reasonable decision. But it must be taken with a generous dose of skepsis. The fact is that even previously, in the era of administrative tranquility and command economy, construction sites, particularly large ones, were transformed harmoniously from "shock" sites to sites with over-extended construction schedules. Yes, obviously a regional power station must be built in the Ukraine. But it is quite clear that it will have to be done under conditions of a very acute energy shortage and disrupted economic links, which in turn will complicate the entire situation in an extreme manner (particularly after the shutdown of Chernobyl). And that is not all. We should not forget that a station that is taken off line for quite a long time is now no longer a producer of energy but a consumer. I can assure you that this is one physical property that cannot be dealt with by ukase.

...The "shock" construction of Unit 4 at the Chernobyl nuclear power station and the no less fantastic experiments during its operation culminated in the tragedy of 26 April 1986. Further negligence led to the fire on 11 October. It remains to be hoped that decommissioning of the nuclear power station will take place under different conditions, under the control not only of the opponents of nuclear power engineering but also honest and, most importantly, competent experts.

P.S. I have learned from informed sources that at the invitation of official circles in Armenia, Mr. Marshall, a major English specialist on nuclear energy, will be making a trip there. The purpose of his mission is to help to recommission a station shut down after the earthquake. The justification for this step is the extreme—at least 50 percent(!)—shortage of energy in the republic.

Nuclear Experts Discuss Future of Atomic Power Station Safety

92WN0003A Moscow PRAVITELSTVENNYY VESTNIK in Russian No 35, Aug 91 p 3

[Interview with Ye. Adamov, director of Energy Technology Scientific Research and Design Institute (NIKIET), V. Orlov, president of the USSR Nuclear Society, V. Malyshev, USSR State Committee for Atomic Energy Oversight chairman, A. Yeperin, director of Leningrad AES, L. Hegberg, general director of the Swedish Nuclear Power Inspectorate, and J. Ollikkala, chief inspector of the Finnish Center for Radiation and Nuclear Safety, conducted by G. Lomanov: "The Baltic's Atomic Necklace—a String of Pearls or a Stone Around the Neck of Countries Developing Nuclear Energy?"]

[Text] *Nuclear power plant safety, a problem which concerns everyone today, is gradually being driven from the pages of our press by topics which are no less important, but more pressing. Yet the state of the power industry will to a large extent determine the level of our none-too-prosperous or well-supplied lives. That is why our newspaper deems it essential to provide regular reports on the opinions of experts in this field and to publish facts and figures from which our readers can draw their own conclusions.*

Participating in today's discussion are Ye. Adamov, director of NIKIET, V. Orlov, president of the USSR

Nuclear Society, V. Malyshev, USSR State Committee for Atomic Energy Oversight chairman, A. Yeperin, Leningrad AES [nuclear electric power station] director, L. Hegberg, general director of the Swedish Nuclear Power Inspectorate, and J. Ollikkala, chief inspector of the Finnish Center for Radiation and Nuclear Safety.

[Lomanov] As you are aware, as a result of a referendum conducted in Sweden in 1980 the decision was made to shut down all nuclear power plants there by the year 2010. However, judging by sociological surveys the categorical nature of this decision has recently been called into question, has it not?

[Hegberg] I recall that the referendum took place shortly after the accident at the American plant at Three Mile Island. After Chernobyl the parliament set even stricter time limits: the first two reactors are supposed to be shut down in 1995-97. Three weeks ago that decision was reconsidered; now the specific date will depend on realization of the energy supply program, on how successful we are in replacing nuclear power with other energy sources, and naturally on our nuclear power plants' level of safety. The original goal still remains, though I believe that even it could be adjusted depending on these three factors. People in Sweden are beginning to realize more and more clearly that nuclear power plants cannot be shut down without causing damage to our country's economy and to the welfare of its citizens.

[Orlov] I would like to make what is, in my opinion, a substantial addendum to that: in addition to common problems in the various countries which are developing nuclear power, there also exist substantial differences. For example, in Sweden nuclear power plants provide one-half of all electric power, while here that figure is only 12 percent. That means that the reasons for developing it in Sweden might prove unconvincing in the USSR. It is also very important to consider the size of a country: a small state may for a time give up a certain technology and then go back to it at a higher stage of its development. There they are certain that one of the great powers will perfect it. Think about it: is it a coincidence that not a single major country is even discussing a moratorium on nuclear energy? Countries like that are forced to look far ahead so as not to find themselves left behind. And that is precisely what would happen if, say, the USSR were to follow Sweden's example and declare a moratorium. We would voluntarily be giving up scientific and technical potential accumulated over the course of several decades at the cost of millions of people's selfless labor. In order to reconstruct that it would take heroic efforts and an equally long time.

[Lomanov] The subject of today's discussion is not the reliability of nuclear power plants in general, but rather the safety of the plants along the shores of the Baltic Sea. Are regulatory agencies satisfied with their level of safety?

[Malyshev] We have three plants in the Baltic region. First-generation reactors are in operation at the Kola AES and Leningrad AES. The Ignalina AES has two more modern reactors of the channel type from the subsequent generation.

Thus the safety level at the Kola and Leningrad plants does not fully satisfy us. Our contacts with our colleagues in the regulatory agencies of Finland and Sweden are aimed primarily at arriving at an ideology for the use of those plants and for the fate of that type of reactors. There are two scenarios. The first involves rebuilding of the plants and their continued use until the expiration of their planned life span. The second is to find an optimum life span, which would probably be less than the planned period of use, at the end of which the reactors would be shut down. The feasibility of rebuilding the VVER-440 reactors in use at the Kola AES has been studied repeatedly, including at the international level, and was not rejected out of hand. The State Committee for Atomic Energy Oversight has given its permission for the rebuilding, though it feels that the premature shutdown option is preferable.

[Lomanov] It would be reasonable to add the six reactors in the first RBMK-1000 generation as well. What is the oversight committee's position with regard to them?

[Malyshev] There exists a concept for rebuilding them, but we do not regard it as fully finalized. We are prepared to consider proposals from operational personnel, if they are sufficiently well-founded.

[Yeperin] A strange situation: all one needs to say is that a nuclear power plant is using a first-generation reactor, and suddenly everyone arrives at the same conclusion—the plant should be closed. I cannot agree with that approach. In recent years the Leningrad plant has been modernized to such an extent that it would be unfair to equate its power plant with the early reactors built in the first generation.

[Lomanov] Let us get away from the technical issues and talk about people. Are you not concerned about the extremely low rate of competition for admission to technical VUZs [higher educational institutions]? Are you not afraid that within a few years' time it may not be the best specialists, to put it mildly, who will be entering jobs at nuclear power plants?

[Yeperin] I am afraid of something else: that our sector will receive neither good nor bad specialists. In view of the present situation in the field of atomic energy VUZs are closing the departments which train operational personnel for nuclear power plants. Yet experienced personnel are leaving, some of them retiring. A very alarming situation. I am convinced that it can be changed only by a law on atomic energy and a program for the further development of energy production in our country approved by the republics.

[Lomanov] In Finland there is currently a move afoot in favor of a fifth unit: at this time the two plants there have four reactors, two of them Soviet. If parliament agrees to

a fifth unit, then what type of reactor would be picked: Soviet, Swedish, American, German?

[Ollikkala] That project is being promoted mainly by representatives of our business circles. The reactor would be their property, and that means that they would be the ones to choose. It is difficult for me to make a prediction; I can merely tell you what I have observed, and that is that the chances of a Soviet reactor winning out in any competition are quite serious.

[Adamov] We are using the words "plant" and "reactor" as if they were one in the same, but we should not forget that they are different things. The problems of safety within the reactor itself are one thing, the problem of safety throughout the entire plant complex quite another. As a rule it is easier to solve the problem of the former than the latter; the reactor is more accessible for changes. But how, for instance, to rebuild a building in order to take more stringent seismic standards into account? When V. Malyshev talks about the lack of a encasement. I must clarify that he is referring to a shortcoming in the buildings, not in the power-producing reactor. I would remind you that around the world such an encasement is not always regarded as an essential—the Super Phoenix reactor functions without one, and it is felt that its [kompaymenda] is quite sufficient.

[Lomanov] Please explain to our readers what that arcane term means.

[Adamov] That means conditions in which protection of the reactor is not guaranteed in the event of accidents such as, for instance, the explosion of a train car filled with explosives next to the reactor or an airplane crash on the roof of the reactor, but which do fully compensate for the internal malfunctions associated with release of radioactive substances.

[Lomanov] Let us hope that no airplane crashes on a plant: all in all, the probability of that happening is virtually nil...

State Action Needed To Erase Nuclear Testing's Legacy

92WN0078A Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 28 Aug 91 p 3

[Article by I. Chasnikov, corresponding member of the Kazakh SSR Academy of Sciences: "Tears of the Test Site: An Eyewitness Account"]

[Text] Semipalatinsk-Alma-Ata—In early August I visited rayons situated in the vicinity of the test site at the invitation of the Semipalatinsk Oblast organization of Znaniye society. In these rayons I lectured and held conversations on the topic "Radiation and Life" and on the issue of ecological education of the populace. Presentations were organized in Semipalatinsk and Ayaguzskiy, Beskargayskiy, Zharminskiy, and Charskiy Rayons. In July I spoke in the city of Balkhash. The people everywhere talked to me about closing down the nuclear test site as soon as possible and categorically objected to going through with two scheduled so-called control nuclear explosions with a yield of no more than 20 kilotons, and one explosion of no more than 1 kiloton. The local populace was also outraged by the compensation for these explosions proposed in the draft ukase of the RSFSR president prepared by the military-industrial complex, and stated that people's health cannot be bought or sold. At the same time, they tearfully talked about their woes and the fact that there has still been no settlement with them for 40 years of nuclear explosions, of which there have been about 500, out of which almost one half were on the ground or in the air. The people asked that their views on the test site be published in KAZAKHSTANSKAYA PRAVDA.

I was surprised by the fact that virtually no preventive efforts have been undertaken among the local populace for many years. The populace has no information on radiation levels or the purity of farm produce turned out. To this day, the cattle graze not only around the test site but also inside it. There have been cases in which the local populace used in their households remnants of machinery and products that had been tested during the explosion of nuclear bombs. I came across people who in their childhood visited the sites where ground explosions occurred.

It was reported at the science and practitioner conference on "The Health of the Populace and the Ecological Situation in the City of Semipalatinsk and Semipalatinsk Oblast of the Kazakh SSR" (July 1989) that the people who lived in localities close to the test site were exposed to doses of radiation impact of tens and even hundreds of rems per year during the period of nuclear weapons tests on the ground and in the air. At the same time, the "Norms of Radiation Safety" envisage maximum permissible doses of total external and internal radiation of no more than 0.5 rem per person per year. This is why it is no surprise that between 1959 and 1987 the rate of deaths in conjunction with leukemia in the oblast increased by a factor of three, and the frequency of the birth of children who are subsequently mentally retarded increased severalfold. The number of congenital deformities and suicides increased substantially. Between 1960 and 1988 the number of congenital anomalies increased from 11.8 percent to 19.2 percent. This percentage in the Union comes to between 10 and 13 on the average. In the village of Sarzhal alone there have been more than 40 suicides in recent years, which until 1964 were not registered.

It has now become known that even small doses of radiation are harmful for people. They may facilitate manifestations of other diseases which apparently cannot be directly linked to radiation.

In early 1990 the Statement of a Group of Scientists Working in the Area of Radiation Safety and Radiation Medicine in Conjunction With the Situation Caused by

the Accident at the Chernobyl Nuclear Power Station was published, in which "substantiation" of the concept of permissible lifetime doses was provided. The concept asserts that a 35 rem dose of radiation exposure is completely safe for man. This antiscientific and antihumane concept drew sharp criticism from the public. The 35 rem level resulted from the simple multiplication of the maximum permissible dose of 0.5 rem per year by 70 years. In the spring of this year a different concept was adopted (Resolution of the USSR Cabinet of Ministers No. 164, dated 8 April 1991). The concept states that a radiation dose exceeding 0.1 rem per year over and above the level of natural and technical background radiation in a given locality gives one the right to compensation, preferences, guarantees, and other measures (radiation monitoring of the environment and foodstuffs, reduction of the content of radionuclides in the air, water, and soil, reduction of the dosage load in the course of X-ray diagnostics and a reduction of the impact of radon generated by the environment, improved medical and sanitary services, and full-value nutrition). According to the new concept, protective measures should be taken in such a manner that in the future people will be able to be exposed to no more than the lowest permissible level, up to 0.1 rem, or no more than 7 rem in 70 years.

By now the level of background radiation has increased due to nuclear explosions, accidents at military and civilian nuclear facilities, discharges into the atmosphere of the products of coal combustion, which contain radioactive substances, and other technical operations by man. On the average, per person, people in the world are already exposed to 0.3 rem per year, and in the USSR to 0.4 rem, due to natural and artificial radiation. A mere 0.1 rem is the actual allowance for people in our country. Our ancestors accumulated dosages due only to natural radiation, about 0.1 rem per year on the average. The "radiation-life" biological equilibrium which existed for millions of years has today been upset.

The RSFSR Znaniye society recently published the generalized materials of the State Commission of Experts of the USSR Gosplan [State Planning Commission] concerning state programs to eliminate the consequences of the accident at the Chernobyl Nuclear Power Station. This is perhaps one of the few official documents in which the situation entailed by the catastrophe at the Chernobyl Nuclear Power Station is outlined objectively. In particular, the document said: "The absence of complete and truthful information, keeping the actual state of affairs secret from the people, including the health status of their children, the striving of the medical establishments not to link the incidence of disease among the populace to the consequences of the accident, and other factors have all been reasons for the exacerbation of the catastrophe as many as several years after the accident: the deteriorating health of the populace, the growth of necessary expenditures, and the aggravation of the sociopolitical climate in contaminated territories." We may apply the same words to the many years of silence concerning hundreds of nuclear explosions at the Semipalatinsk test site and the woes they have inflicted on the local population and the environment. The people who have suffered from nuclear explosions have stopped being silent only 40 years later. The Semipalatinsk test site has been silent since October 1989 as a result of the mighty pressure brought to bear by the entire people.

However, the supporters of preserving the test site have not been silent. They have made presentations to the populace and in the press. They have offered their "substantiations" of the need to continue testing and perfecting nuclear weapons. They have called those who are against nuclear explosions and in favor of the policy of strategic arms reductions "traitors," even though the president of the country is at issue here.

It has been calculated that about 15 million people have already suffered from nuclear explosions throughout the world. Academician A.D. Sakharov maintained that an explosion of a one megaton bomb claims the lives of 10,000 people. Data on the correlation of the yield of nuclear explosions on our planet and the specific radioactivity of foodstuffs were quoted in the book: "Radiation. Doses, Effects, and Risks" (Mir Publishing House, Moscow, 1988). Thus, the content of radioactive substances in foodstuffs (grain, meat, and milk) increases sharply in years following the most intensive nuclear tests in the atmosphere. The specific radioactivity of foodstuffs in, for example, Denmark, came to about 9 becquerels per one kilogram of products in 1964 and 1965, following intensive testing in 1961 and 1962. The Munich Institute for Environmental Studies recommends that adults not use foodstuffs whose contamination exceeds 10 becquerels per kilogram, and that children not use those above 5 becquerels. Therefore, in these years, foodstuffs for children were poisoned even in countries far removed from nuclear test sites. It is to be expected that the content of radioactive substances in foodstuffs produced in the vicinity of the Semipalatinsk test site was no lower than in Denmark.

More than 6 trillion curies of radioactive substances were discharged during the period of nuclear testing at all test sites on our planet (see materials of the International Congress "Voters of the World Against Nuclear Weapons," Alma-Ata, May 1990). One curie unit amounts to 37 billion becquerels. One becquerel amounts to one nuclear disintegration per second. The total yield of nuclear explosions in the USSR comes to 51.1 percent of the total yield of nuclear explosions in all countries, despite the total number of explosions in the USSR being smaller than in the United States ("Radiation. Doses, Effects, and Risks"). Therefore, more than 3 trillion curies of radioactive substances were discharged into the atmosphere in the USSR over many years.

During the Chernobyl disaster, 50 million curies of radioactive substances were discharged into the atmosphere within a very short period of time. The monitoring of foodstuffs was set up in European countries

after the disaster. Thus, the Munich Institute for Environmental Studies established that the total artificial dose of radiation in the territory of Germany exceeded the pre-Chernobyl level by factors of between 10 and 100. The institute publishes data on foodstuffs shipped in the bulletin Environmental Herald on a weekly basis, indicating addresses where they were produced, including those in other countries. The institute calls for omitting from the menu bilberries (up to 573 becquerels in Austria and 59 becquerels in Germany), German fowl (88 becquerels), forest mushrooms (about 600 becquerels in Austria and 55 becquerels in Poland), and syrup from the USSR (26 becquerels). The institute believes that everything that grows in the forest is unfit for use (wild strawberry, blueberry, cranberry, raspberry...).

The local inhabitants with whom I met do not recall the produce grown by them ever being examined. I cannot assert that the territory of all rayons adjacent to the test site is contaminated. It is necessary to have maps of the radioactive situation both at the test site itself and the territory around it in order to take care of all doubts. A map of areas contaminated as a result of the Chernobyl disaster has long been available. Radiation "spots" on the surface of the Earth may appear hundreds and thousands of kilometers away from the location where radioactive substances were discharged or generated.

This is all the more so because until 1990, underground explosions were effected not only at the Semipalatinsk test site but in many other oblasts of our republic. In Guryev Oblast alone there were about 20 explosions.

In the 25 years between 1965 and 1989 the United States and the USSR detonated about 1,000 underground nuclear explosions.

As was already noted, cases of serious hereditary anomalies have been registered in zones with increased radiation. Given a lifetime dose of exposure equal to 35 rem for parents, about 10,000 such children may be born per 1 million newborns, whereas in subsequent generations continuously residing in a zone of ionizing radiation the rate of mutation may increase by a factor of 10 (materials of the aforementioned commission of the USSR Gosplan).

The overall death rate of the population is now increasing. The growth of the death rate due to the impact of the global fallout of the products of nuclear explosions is likely to continue until the end of our century. The peak of oncological diseases (apart from leukemias) begins to occur approximately 35 years after exposure to a one rad dose. These data are cited in the book mentioned above, "Radiation. Doses, Effects, and Risks." The radioactive contamination of the atmosphere, water, and soil was worst in 1961 and 1962. The highest count of radionuclides in foodstuffs occurred in 1964 and 1965.

Our descendants will not forgive us if we fail to take urgent measures to restore the health of all those who have suffered as a result of nuclear explosions and other ecological calamities, not only in Semipalatinsk Oblast but in many other oblasts also.

It is necessary to develop a state program for eliminating the consequences entailed by detonating nuclear explosions for both military and peaceful purposes. In discussing victims, we should mention the servicemen who directly carried out the orders to test combat materiel. They number in the tens, if not hundreds, of thousands. If the servicemen are treated the way they wanted to treat military reservists who took part in the elimination of the consequences of the Chernobyl disaster, this is hardly a credit to our state. I took part in conferences of workers involved in the cleanup after the Chernobyl disaster, which were called the Chernobyl Union. About 200,000 personnel of the USSR Ministry of Defense were used for extensive decontamination alone. They were exposed to various doses of radiation (7.5 rem per person on the average). Of those drafted by the military commissariats, about 7,000 people died by June 1990, and about 60,000 were crippled. Many of them still did not succeed in obtaining documents certifying that they were victims of radiation. I do not want to name the organizations or give the names of officials who withheld or underreported the doses to which cleanup workers were exposed. Investigations of this and other cases associated with the events in Chernobyl are underway.

In the environment of the strictest secrecy procedures in preparing and carrying out nuclear explosions, individuals (servicemen and civilian) affected by radiation were considered sick for unrelated reasons. This is why the publicly released statistic of 10,000 affected by radiation among the populace in conjunction with nuclear explosions at the Semipalatinsk test site does not inspire confidence. Articles by direct participants in the holding of the nuclear tests, which have recently begun to appear in the press, clarify the true picture of events at the nuclear test site in less rosy tones than was portrayed to us by the defenders of the test site, for example, USSR People's Deputy Colonel N. Petrushenko.

It is necessary to make an objective appraisal of the situation that has developed as a result of 40 years of nuclear explosions, by way of a program and a law which need to be developed and adopted in order to eliminate the consequences, in terms of human health, of the nuclear explosions at Semipalatinsk and other test sites, and to provide social protection for the citizens affected by these explosions. It is necessary to map out measures to substantially improve social living conditions and health care, taking advantage in the process of the Japanese experience of caring for the people who suffered during the nuclear bombing. Compensation, which must be allocated to the affected areas, should be allocated primarily to building well-equipped medical and other establishments. The people are grateful for the setting up of a diagnostic center in the city of Semipalatinsk. However, having learned what their illnesses are, they are unable to receive treatment because the necessary drugs are lacking. It is necessary to substantially cut back on X-ray diagnostics in health care.

The population should receive full-value nutrition which, in addition, should be continuously monitored. At present, foodstuffs are produced and sold without any control. The people do not possess elementary knowledge of conditions for residing in zones of radioactive contamination. I noticed that many premises are not aired, and naturally occurring radioactive radon gas is accumulated as a result. The people should breathe clean air in all cases, both at home and at work. Special filters should be used when necessary.

It is necessary to drink only boiled water. The naturally occurring radon gas is expelled in the process of boiling; radionuclides and other chemical elements sink to the bottom after a while. We must say that radon gas must be generated in greater quantities than before the beginning of explosions due to the destruction of rock at the Semipalatinsk test site. Recommendations concerning correct food preparation and nutrition should be given to the people. They should be aware of the content of radionuclides in foodstuffs and know which foodstuffs are radiation protectors, that is, are capable of speeding up the expulsion of radioactive substances from the organism.

We should teach the people how to live in a radioactive environment rather than scare them with radiation. This is what we acutely need at present.

'Unilateral' Closure of Semipalatinsk Range Questioned

PM2310110591 Moscow Russian Television Network in Russian 2100 GMT 19 Oct 91

[From the "Vesti" newscast: Report by G. Fadeyeva and D. Britikov, identified by caption; figures in brackets denote broadcast time in GMT in hours, minutes, and seconds]

[Text] [211037] This yellow steppe land, 16,000 square km in area, was until recently the most secret place in the Soviet Union—the Semipalatinsk nuclear test range. In August this year, by decree of President Nazarbayev, it was closed down, although the last explosion took place exactly two years ago, on 19 October 1989. There is a [word indistinct] 40 meters deep below this concrete structure [tumba], and the earth around seems to be crammed with wires and steel cables. In the past 40 years there have been 467 nuclear explosions here. The explosions were of the most varied kind—as a result of one, for example, this lake appeared—"atomgol" [atomic lake], as the Kazakhs say.

[Man later identified by Fadeyeva as Colonel Petrushenko] When they were preparing the project to divert the northern rivers this explosion was conducted in the interests of the national economy and the interests of the Central Asian republics. The creation of man-made reservoirs and canals by means of nuclear explosions was developed on a scientific basis.

[Fadeyeva] Colonel Petrushenko suddenly turned up among the journalists who came here in mid-October especially to see for themselves the excavation of the atomic lake.

[Petrushenko] Excavations have been conducted here once or twice, involving among others the well-known journalist Nevzorov.

[Fadeyeva] In your opinion, should the Semipalatinsk range be closed or not?

[Petrushenko] The unilateral closure at the behest of President Nazarbayev and with President Gorbachev's tacit consent will lead to a general lessening of the likelihood that the American, Chinese, and French ranges will be closed too.

[Fadeyeva] The man in charge of the range, Lieutenant General Antonenko [as heard], dared to show journalists the ecological map of the locality, adding admittedly that it has not been officially published and is secret. Just like everything here in the three oblasts of Kazakhstan bordering on the test range—Semipalatinsk, Karaganda, and Pavlodar—which in the past 40 years were of course unaware that they were hostages to their nuclear upbringing. The result—an abnormal infant mortality rate and a concentration of harmful substances in the water, milk, and meat which is dozens of times higher than in other regions. This rock, which is in this place as a result of an explosion, is like a monument to everything which has died at the former Semipalatinsk nuclear test range. [211247]

Health Effects of Irkutsk Nuclear Blasts To Be Studied

PM3110144391 Moscow Russian Television Network in Russian 2100 GMT 29 Oct 91

[From the "Vesti" newscast: Irkutsk report by A. Kodkin and B. Kastomarov, identified by caption; figures in brackets denote broadcast time in GMT in hours, minutes, and seconds]

[Text] [211236] [Kodkin] Irkutsk's seismological services registered a powerful underground tremor 10 years ago. The epicenter was here, 5km from the village of Khandagay in the Ust-Ordynskiy Buryat Autonomous Okrug. Seismologists were not allowed to come here. It's now clear why. The earth rocked with an underground nuclear explosion. It was prepared secretively, behind barbed wire, guarded by machine gunners. Who needed this explosion and why? Not somewhere in the depths of the taiga, but here where tens of thousands of people live. People in the Angara region might not have learned about it had ARGUMENTY I FAKTY not published a special map produced by the CIA. According to the map there were two underground nuclear explosions in Irkutsk Oblast. A comprehensive study of the potential danger area has begun—after a 10-year time lag. Will the

specialists disprove one of the most alarming hypotheses? Was the nuclear explosion the cause of an increase in the incidence of cancer among this area's inhabitants? [211337]

1985 Nuclear Ship Accident Said To Pose No Further Risk

92WN0056A Moscow KRASNAYA ZVEZDA in Russian 17 Oct 91 p 1

[Article by V. Danilyan, captain 1st class, head of the chemical service, Pacific Fleet: "Is It Worth Fanning Radiophobia"]

[Text] Recently, radiation is often a topic in local newspapers and radio and television broadcasts in the maritime kray. Several deputy inquiries are also sounding the alarm about it. One of these, addressed to Primorskiy Rayon Ispolkom Chairman V. Kuznetsov and to the Commander of the Pacific Fleet from the Primorskiy Kray Soviet of People's Deputies Commission of Defense and State Security, signed by deputy V. Cherepkov, demands the taking of immediate steps to eliminate the consequences of the nuclear reactor accident that happened on one of the ships in the fleet in 1985. The inquiry speaks of a critical situation that has taken shape in some settlements along the shore. In the opinion of the deputies, representing a district in the area where traces of the radioactive cloud passed by, the temporary burial site of the radioactive wastes in the trail and a section of the bottom of an area of water in one of the bays represent a serious threat to the population's health.

However, is there a "real threat" to the population's health? How is this concern argued, and what criteria are used in this?

It is reliably known that in all the years after the accident, we have found no cases of job-related pathology or illness among Pacific Ocean sailors or the personnel of the ship-repair plant, caused as a consequence of ionizing radiation. The indicators for the overall and oncologic morbidity of the civilian population living in these rayons do not exceed similar morbidity indicators for Primorskiy Kray on the whole. Last year, a brigade of doctors from children's institutions in the kray, which included pediatrician-specialist L. Prodan, the kray children's oncologist M. Kurilskaya, chief hematologist L. Kuznetsova, laboratory doctors L. Mikryakova, T. Maksimenko, and Z. Potemkina, and clinical house-surgeons of the pediatrics faculty of Vladivostok State Medical Institute M. Krasnyy and L. Khitev, carried out a clinical examination of children. During the examinations, 2,207 people were studied. No cases of oncologic or hematological pathology were discovered.

Of course, one cannot deny that in August 1985 there was a real danger of undermining the health of not one, but of hundreds and thousands of people. However, this threat was eliminated. Obviously, it is necessary to talk about this in greater detail.

Immediately after the accident, the first measures were undertaken to eliminate its consequences and to normalize the situation in order to ensure the start-up of the ship: the search for and collection of the discarded elements of the broken reactor, and the removal and burial of the damaged reactor. Further work to normalize the situation was carried out in four stages from October 1985 to May 1986. A tremendous amount of work was done in this period: Four trench-type burial grounds with an overall capacity of 5,650 cubic meters were installed, and more than 100 meters of asphalt covering, 240 meters of contaminated porous clay filler, and 350 tons of building structures were removed and taken away for burial. The decontamination of roads with asphalt and concrete surfaces and of the moorages, boats, and ships was performed with high quality. The territory of the trail was fenced off with barbed wire for anoverall length of four km.

As a result, the radioactivity of objects in the external environment was reduced by a factor of 10,000. By April 1986 already, the radioactivity of the ground layer of air, sea water, and soil in a large part of the plant's territory did not exceed background values. Over the entire period, the aerosoleffectiveness of air in the region of residential settlement remained unchanged—at the natural background level.

After completion of work to normalize the radiation situation in the territory of the plant, the radiobiological laboratory of the plant's radiation safety service constantly monitored the external environment. Similar monitoring was periodically conducted by specialists from the chemical and medical services of the Pacific Fleet. Specialists from Primorskgidromet and the kray sanitation and epidemiological station have been involved in this work since 1989. During the time of observations—from August 1985 up to the present—the maximum output levels of doses of gamma radiation in the trail have decreased by roughly a factor of 10. In 1988 and 1990, a group of specialists from the central laboratory of the VMF [Navy] and the Institute of Atomic Energy imeni I. Kurchatov performed a radioecological study of the territory of the ship-repair plant and areas of water in the bays. It was ascertained that the area of radioactive contamination on the whole had retained its borders.

In May 1991, specialists from the fleet chemical and medical services and the plant's radiation safety service, jointly with a group of people's deputies, carried out a detailed study of contamination with radioactive substances in one of the settlements. The results showed that the radiation situation in the residential zone of the settlement is characterized as normal.

In connection with this, the publication in one of the local newspapers of an article entitled: "Radiation in the Children's Sand-Box" this summer is surprising. It accurately gives the figures for the gamma background values, but the commentaries on them, unfortunately, are far from professional. The anomalies that were

discovered in the territory of the school stadium and in the children's sandbox at a nearby home, with a gamma background level of up to 40 microroentgens per hour, were caused only by radionuclides of natural origin. This article also abounds with inaccuracies and with references to the particular opinion of the head of the fleet radiation safety service. The fact is, no such post exists in the fleet.

Against the background of the Union-wide radiophobic boom, one can understand people's concern and even the desire of residents along the shore to solve their problems, especially socioeconomic ones. However, the actions of certain press organs are absolutely incomprehensible. In what manner do they wish to help people solve their urgent problems, publishing articles such as: "Radiation in the Yard," "Death Without a Cover," or "Five Years After the End of the Light?" By manipulating the numerical variations in the radiation background without explaining the reasons for these changes, they are only charging up anxiety among the population. And this is at a time when we are all in need of complete, frank and, above all, trustworthy and correctly interpreted information.

Murmansk Authorities Investigate Northern Fleet's Nuclear Waste Policies

LD2310182191 Moscow Radio Rossii Network in Russian 1600 GMT 22 Oct 91

[Report by Murmansk Oblast correspondent (Yuriy Arkhipov)]

[Summary] Murmansk Oblast is holding its first ecological investigation into the Red Banner Northern Fleet's observance of environmental protection legislation. Ecological experts from the Oblast nature protection committee and military representatives were able to visit four bases for vessels with nuclear power installations, two military factories, five radiology laboratories, and the temporary bases for nuclear submarines. The military was "open in the extreme," and the ecologists examined everything they wished to see, relevant documents included. "The commission concluded after visiting all these facilities and many more and after analyzing the data received that the radiation situation at the facilities of the Red Banner Northern Fleet gives no grounds for apprehension. As for radioactive waste, that is quite another matter. During the checks, the ecologist deputies finally got an answer to a question that has bothered them for many years: that of where the fleet dumps its waste. They dump it in the same place as the Murmansk shipping line, in the Kara Sea. I am talking about liquid waste which is still being dumped by the military today. Despite everyone's being generally pleased by the check, the Oblast nature protection committee has the following facts at its disposal: a recent statement by USSR People's Deputy (Andrey Zolotkov) on radioactive waste being dumped in the sea by the Murmansk shipping line and the latest information I mentioned above. All this is a gross violation of the London Convention on a moratorium on dumping radioactive waste into the sea. Some experts believe that these two facts are sufficient for all the material that has been amassed to be handed over to the transport procuracy. In the next few days, the procurator will receive these documents. It is hard to say how events will develop. There is talk to the effect that grounds exist for instituting criminal proceedings. True, there are various other opinions, but the last word will go to the procurator."

Environmental Impact of Chevron Tengiz Oil Field Exploration

92WN0005A Moscow ROSSIYSKAYA GAZETA in Russian 14 Aug 91 p 2

[Interview with L. V. Popov, socioeconomic union coordinator, conducted by Viktor Romanchin: "Russia and the World: 'Industrial Racism' in the Tengiz Oil Field"]

[Text] *The Tengizneftegaz Association and the U.S. firm Chevron are preparing to sign a contract to develop the Tengiz Oil Field. How will development of this rich and promising field affect the region's environment, and what will be the effects of development on the health of the people who work at the refineries which process Tengiz oil? We asked L. V. Popov, coordinate of a socioeconomic union, to analyze the situation.*

[Popov] The region in which the Tengiz Oil Field is located is semiarid and is notable for its high degree of vulnerability to anthropogenic influences. Even now, before large-scale development has begun, the anthropogenic burden has put the region's entire ecosystem in a "depressed and degraded state." Even test wells in the vicinity of Tengiz and in nearby areas have released hydrogen sulfide into the atmosphere.

The majority of the pollution sources have not been documented. Soils in the vicinity of test wells are being polluted. Yet virtually no provision has been made for a system of comprehensive environmental monitoring in connection with the project; without such a system industrial development of the oil field is impossible.

Development of the Tengiz Oil Field could cause settling of its surface due to the intensive removal of fossil fuels. The result could be numerous accidents, formation of lakes and swamps, flooding of wide areas, and intensive dust storms.

[Correspondent] Does the project make provision for the socioeconomic effects of developing the Tengiz Oil Field?

[Popov] The project does not make any provision for the public health and ecological safety of the population, which will increase sharply. Even now the region has low drinking water quality, and there has been a significant increase in the number of persons contracting typhoid

fever and viral hepatitis, and the number of persons suffering from tuberculosis, various types of dermatitis and eczema has increased.

The project also lacks a solution to the problem of how to create special areas for the neutralization, burial and utilization of industrial, construction-related and household wastes. No provision has been made for drinking water treatment. No plans have been made for a system of biological purification at treatment facilities.

Now a word about the quality of Tengiz oil. Despite its uniqueness, this oil also contains aggressive components (hydrogen sulfide, carbonic acid and mercaptans). Therefore during refining of Tengiz oil by refineries which are not presently handling toxic raw material the workers will be exposed to a hazardous ecological situation. There is a possibility of nausea and headaches, and in the presence of higher concentrations of toxic substances there could be disability, loss of mental functions and damage to eyesight.

[Correspondent] At the present time preparations are being made to turn over development rights to the entire Tengiz region to the Chevron Company. Will that company be concerned about preserving the environment of the country of which it about to take control?

[Popov] Here is what we have managed to find out about the activities of Chevron in its home territory, the United States. At our request the organization Multinationals and Development Clearinghouse prepared a packet of newspaper clippings (from U.S. sources) which report that in the 1984-88 period Chevron held the "record" for the greatest amount of oil spilled. In September 1989 the U.S. Department of Labor fined Chevron $877,000 after three workers were severely burned during an explosion and fire at an oil refinery. Between 1986 and 1988 the State of California filed a number of criminal charges against Chevron for storing hazardous wastes in leaking or open containers. In 1988 the U.S. Department of Justice sued Chevron for $8.8 million in connection with the company's frequent violations of government environmental pollution standards. Chevron has also been accused of violating the Clean Air Act and permitting unmonitored emissions of sulfur dioxide.

Chevron has been repeatedly criticized in connection with numerous other ecological and social problems, including its operations in South Africa and an attempt to drill for oil in the Montana Wilderness Preserve. This company was also accused of "industrial racism" when it allowed by-product gases to burn unchecked for four days at a refinery located in the poor town of Richmond, California, which has a primarily black population.

The United States has fairly strong environmental protection legislation, yet even that has proved insufficient to prevent Chevron from polluting the environment. One can hardly expect this scandal-plagued company to take a different approach to its operations in Russia.

Kamchatka Environmentalists Oppose Oil Exploration

OW0611081691 Moscow INTERFAX in English 2308 GMT 5 Nov 91

[Following item transmitted via KYODO]

[Text] Enviromental groups on Kamchatka (in the Soviet Far East) have come out against proposed exploration for new oil reserves on the peninsula by the American Hunt Oil Company and the Soviet firm Sakhalingeologia.

Hunt Oil and Sakhalingeologia are in the process of getting permission from the Kamchatka authorities to conduct exploration in the Karaginskiy Island region, towards the north end of the peninsula. If oil reserves are discovered, extraction of the oil will be conducted on a production sharing basis. Hunt and Sakhalingeologia have already received permission for the exploration and extraction of oil from the national Koryanskiy Autonomous District (within greater Kanmchatka) which exercises authority over Karaginskiy Island.

Ecologists claim that exploration on the Karaginskiy shelf will destroy or decimate valuable species of fish including Pacific salmon.

Increasing Lung Cancer Deaths Attributed to Fossil Fuel Use

92WN0004A Moscow RABOCHAYA TRIBUNA in Russian 25 Sep 91 p 2

[Article by Mikhail Dmitruk: "Doctor, Could You Listen to My Country's Lungs Sometime...": "What Is the Cause of the Massive Incidence of Cancer? The Air Is Polluted With Radiation, Scientists Think—and Recommend Their Medicine"]

[Text] This story began over 30 years ago. It was then that at the initiative of academicians S. P. Korolev and I. V. Kurchatov a CPSU Central Committee and USSR Council of Ministers decree was prepared concerning development of new principles for obtaining energy and new principles of obtaining propulsion without discarding mass and new principles for protection against nuclear radiation. The significance of this research to our country was so great that Marshal of the Soviet Union G. K. Zhukov petitioned for the program: "Concerned as I am about the fate of Russia, I request that you sign this decree." And it was signed by N. S. Khrushchev, A. N. Kosygin and other leaders on 23 June 1960.

Work on all aspects of this program was done by I. S. Filimonenko, chief designer of the Krasnaya Zvezda Scientific Design Association. Yet following S. P. Korolev's death he was removed from the position he held. Is it possible that the researcher had poorly performed the assignment given him by the party and the government?

"We succeeded in building and testing a fundamentally new power plant," related Ivan Stepanovich. It operated continuously for four days, until it was shut down. Many specialists became convinced of the reality of a process based on new physical principles. Even now I do not have the right to reveal all its particulars. I can merely tell you that the plant split water into oxygen and hydrogen and created steam with a temperature of 300 degrees celsius and a pressure of 300 atmospheres, as required to drive turbines. But in contrast to thermal and nuclear power plants it did not produce harmful wastes. Moreover, it could be used to clean the hazardous wastes of thermal and nuclear electric power stations out of the environment. The plant emitted radiation which accelerated the half-life of radioactive substances, even to the point of fully neutralizing them within a short period of time."

Does that mean that there is a means of removing radiation pollution from the environment? Perhaps I had heard wrong. But the scientist repeated what he had said and explained what it meant.

It is a well-known fact that the Sun is periodically racked by tremendous cataclysms equivalent to the detonation of millions of atomic bombs. But what happens on Earth at those times? Is it affected by the nuclear echo?

It is affected, Filimonenko determined. And in part in a very unexpected fashion, producing acceleration... of the rate of radioactive decay.

"Oh, well," I said, disappointed, "we cannot very well make the Sun shine the way we want it to."

"That is true," responded Filimonenko, "but we are quite capable of creating sources of nuclear radiation similar to that produced by the Sun."

During testing of his power plant in 1957 he discovered odd changes in its electrolyte. Isotopes were appearing in it which had not been there before: tritium, helium-3, oxygen-17 and oxygen-18. That means that synthesis of light nuclei was occurring in the electrolyte—something similar to what, in the opinion of some scientists, happens in the Sun.

At first the scientist was frightened. Was this a joke? He had obtained a nuclear reaction at a temperature of only 1,150 degrees celsius (today this would be called a cold thermonuclear reaction). This reaction was fairly simple to control and use to accelerate the decay of radioactive substances.

At that time, three decades before the Chernobyl disaster, the scientist had already predicted similar cataclysms and, more importantly, had proposed ecologically sound technologies for suppressing radiation and rendering the waste products of the atomic industry harmless. Today it would be difficult to overstate the significance of those proposals. It is no secret that experts have acknowledged the ineffectiveness of the present decontamination measures used in the polluted zones. Now there is hope of saving the millions of people who suffered from the disaster. And not just them. Because nuclear power plants are not the only source of radioactive contamination.

...In 1896 Becquerel discovered radioactivity, and was also the first to be injured by it. He carried a piece of radium-226 around in his pocket, and a wound that would not heal formed in that spot. But were you aware that there is radium in coal—and, incidentally, uranium and thorium as well? Of course, those radioactive impurities are only present in microscopic quantities. But we process coal in huge quantities. What is the danger in that? Judge for yourself.

In 1948 Moscow's Thermal Electric Power Station #12 pulverized coal from Moscow Oblast. This coal was burned in a special furnace and the amount of uranium contained in the dust-like fuel measured. As soon as an elevated amount was observed, that particular shipment of coal was rerouted to a military plant, where the valuable impurity was removed.

Yet hundreds of other thermal electric power stations burned anything—fuel oil, oil shale and other types of fuel, all of which contain radioactive impurities.

Now let us calculate along with Ivan Stepanovich, at least in approximate terms. Since the beginning of human civilization 100 billion metric tons of hydrocarbon fuels have been burned, releasing 50 million curies of radium-226 plus as much as 300,000 metric tons of uranium-235 into the atmosphere. Today the world burns 10 million metric tons of hydrocarbon fuels each year, and those fuels contain 5 million curies of radioactive substances. This is equivalent to blowing up the Chernobyl reactor in addition to the 10 which have in effect already blown up. In the opinion of experts the population should be evacuated if pollution of an area exceeds one curie per square km.

In view of calculations such as these it should come as no surprise to find cases of catastrophic declines in health which scientists supposedly cannot explain. When homes in England were heated with coal, teenagers who worked as chimney sweeps often contracted cancer. Many miners in Schneeberg died in middle age of so-called "miners' disease." Later doctors discovered that the majority of them were suffering from lung cancer. Eventually researchers modeled a similar situation: they injected monkeys with a small quantity of radium-226 taken from coal. The animals contracted oncological illnesses.

That was many years ago, but now the experimental animals are... millions of people. Here are the statistical data. In the United States in 1900 the cancer death rate was 3.7 percent, but by 1959 this figure had risen to 15.7 percent. In the USSR in 1989 almost one-third of all deaths were cancer patients.

To Filimonenko it is clear that the principal reason for this rapid increase in oncological illnesses is hydrocarbon-based energy production. According to his calculations, even without an increase in the amount of fuel burned by the year 2010 humanity will release another 100 million curies of radium-226 into the atmosphere—and it is not beyond the realm of possibility that the planet's entire population will be threatened with death from cancer.

Up until now scientists have attempted to prove that nuclear power is the solution. Yet for some reason they have failed to mention that nuclear power plants also release a huge quantity of radioactive substances into the air, even when no accidents occur. The technologies to intercept all of these wastes simply do not exist. And substitution of nuclear energy production for hydrocarbon-based energy would in any event be fatal to life on Earth.

Filimonenko's work a quarter of a century ago would have made it possible to "avoid" the kind of nuclear energy which now threatens life on Earth. It would have been possible to restructure hydrocarbon-based energy production, which upon closer inspection proves to be just as harmful as nuclear energy. Ecologically sound plants would have been built instead of the infamous boilers and reactor units.

Here is the economic justification for such replacement made by the researcher: the active zone of an atomic reactor costs R380 million [rubles]. Filimonenko's power plant of the same capacity would have cost R100 million in serial production. But unfortunately...

"Humanity has a real chance of survival," the scientist said in conclusion, "but it could squander that chance. It was Mendeleev who said that burning fossil fuels 'is like stoking a furnace with banknotes.' Because coal, oil and natural gas are highly valuable raw materials for the chemical industry; spewing them out of a smokestack is at the very least stupid. We could have put a stop to this faulty practice in our country by implementing the resolution of 23 June 1960. My research indicated that that was completely realistic. To whose benefit was it to terminate that research, and why? Is it not time for the presidents of the USSR, the RSFSR and the Union's other sovereign republics to finally realize that radiation kills everybody—capitalists and communists, Christians and Muslims, masters and servants... Until now information regarding the radiation threat was a state secret. Ordinary people had no idea what a monstrous threat thermal and atomic energy production represented, and therefore they did not object to murderous projects. But now all the most secret information is being made public, and the ranks of the 'greens' are growing with each day that passes. Thanks to their efforts the construction of many thermal electric power stations and atomic electric power stations has been halted or forbidden. But that is not the solution; we need alternative energy sources, ones which are ecologically clean. I have my own option to propose. Recently there appeared hope that it might become a reality. In 1988 I was permitted to resume my research. Thanks to the selfless labor of many designers, engineers and workers, experimental models of ecologically sound power plants have been created at a certain scientific PO. But, just as a quarter of a century ago, the financing for this work was suddenly cut off. Who once again benefits from this fiendish game, and why? Could the death of all of humanity be to someone's advantage? I can find no reasonable answers to these questions. I only know that it would take R12 million to complete our research, and someone was not willing to spend that money..."

One last thing. In contrast to the Tokamaks and Ogras, Filimonenko's power plant has already worked, and in contrast to the RBMK [uranium-graphite channel-type reactor] it has never blown up. If we do not help this scientist complete his research now, in a few years it will be too late. We will be done in by radiation, and we will deserve our fate.

* * *

The following chart shows mortality rates in the republics of the USSR. The columns indicate how many persons died per thousand in each year indicated. For example, in the RSFSR in 1960 a total of 814,000 people died, yet by 1985 this figure had doubled.

A majority of republics steadily climbed this cruel ladder. Latvia and Estonia were ahead of all the rest. Why? The citizens of those republics take pride in their high standard of living. Ivan Filimonenko posed this question to Arnold Ruutel when they met in 1990. In search of an answer Ruutel talked for a long time with his advisors, but they could not come up with a solution to this paradox, either. Then the Russian scientist provided the explanation: thermal electric power stations in Estonia and Latvia burn local oil shales, which have a very high concentration of uranium and radium.

Republic	Year			
	1960	1970	1981	1985
Latvia	10.0	11.2	12.6	13.1
Estonia	10.5	11.1	12.3	12.6
Ukraine	6.9	8.8	11.3	12.1
Russia	7.4	8.7	10.9	11.3
Moldova	6.4	7.4	10.3	11.2
Lithuania	7.8	8.9	10.3	10.9
Belarus	6.6	7.6	9.6	10.6
Georgia	6.5	7.3	8.6	8.8
Turkmenia	6.5	6.6	8.5	8.1
Kirghizstan	6.1	7.4	8.0	8.1
Kazakhstan	6.6	6.0	8.0	8.0
Uzbekistan	6.0	5.5	7.2	7.2
Tajikistan	5.1	6.4	7.8	7.0
Azerbaijan	6.7	6.7	6.9	6.8
Armenia	6.8	5.1	5.3	5.9

Declining Birth Rates, Childhood Illness Linked to Environment

Deaths Exceed Births in Ukraine

92WN0085A Kiev PRAVDA UKRAINY in Russian 17 Oct 91 p 2

[Article by Viktoriya Yasnopolskaya: "In Ukraine More Are Dying Than Are Being Born"]

[Text] Recently in the Ukraine Museum of the History of Medicine in Kiev a meeting was held between journalists and the representatives of the republic's research centers of genetics and clinical immunology and institutes of the Ukraine's Academy of Sciences, along with deputies to the republic parliament.

The facts and figures that were presented at the meeting were simply shocking. The demographic situation in Ukraine is such that if it is not addressed as seriously as possible literally today, tomorrow irreparable damage will occur.

Judge for yourselves. The increment in the birth rate in the republic (according to 1991 data) is zero. Many more of us are dying than are being born. This is frightening for the additional reason that those who actually manage to be born have too few changes for normal health. Innate and acquired pathologies and severe hereditary diseases are the consequences of unhealthy parental genes.

Already, ineluctable statistics indicate that in some regions only 20-30 percent of school-age children can be considered healthy. On the whole, the disease rate for Ukraine's population has increased by a factor of 2.2 for all classes of disease.

The reasons for this disastrous situation are known. They include, first and foremost, our common misfortune and pain—Chernobyl. They include the global pollution of the biosphere, the consequences of Ukraine's overpopulation with industrial enterprises and motor vehicles. They include the sick earth, into which 175,000 tons of chemical herbicides and pesticides go annually.

The scientific conference on "The Health and Revival of Ukraine's People" that is currently being held in Kiev represents the first attempt to work out comprehensive solutions of environmental problems and the demographic problems that are inseparably bound up with them.

Ufa Births Continue Steady Decline

92WN0085B Moscow SOVETSKAYA ROSSIYA in Russian 29 Oct 92 p 2

[Article by Staff Correspondent M. Merzabekov: "To Have Children, or Wait?"]

[Text] Ufa—About 10 years ago in Ufa the millionth inhabitant was born. I recall that the local press gave fitting attention to that fact, which is understandable. To see the republic's capital among the cities with population's of a million was considered prestigious.

However, the euphoria over this matter rapidly disappeared among Ufa's inhabitants. People started to realize that the life of a big city is associated with numerous negative factors for the health. Crowded conditions in stores and on transport. Air pollution from vehicle exhaust, and excessive noise. The true state of the environment ceased to be a deep secret. And at this point the perestroyka upheavals began with the attendant material shortages and psychological instability, and it came to be downright uncomfortable to live in a big city.

The demographic situation responded immediately to the deviation in the social backdrop. First of all, the birth rate started to drop. Whereas its curve reached a "peak" in 1987, when 18,700 births were recorded, starting the following year it headed downward at an increasingly steep rate. 1988 saw 17,800 births in the city, 1989—16,400, and 1990—14,700. In 1991, judging from figures for the first nine months, the city will have about 13,500 births.

We asked specialists to comment on these figures.

P. Yangurazova, deputy head of the city public health department for children and maternity:

"Yes, it's an unhealthy symptom. We conducted a survey among young mothers who do not want to have more than one child and have terminated their pregnancies. Among the reasons they cited, poor social and living conditions occupied first place. Problems with housing, kindergartens and nutrition, the high cost of living, and general shortages. Second place went to the poor condition of the environment. Everyone knows the story of the pollution of Ufa's water with phenol."

T. Stupnikova, the city's chief pediatrician:

"Today we see the following picture: whether they be pregnant women or nursing mothers, virtually all of them are anemic. And look at the children: you will not see rosy cheeks on many of them. By and large, the children are unhealthy. It is rare for them to be classified in the first health group. Children's resistance has declined drastically, and their immunity has been weakened. After the phenol pollution last spring, we conducted a general medical examination and identified 1,500 young patients with various acute conditions—irritations of the gastrointestinal tract, skin diseases, liver ailments, allergies, and various manifestations. But

what is typical is that a commission of the RSFSR Ministry of Health, on the basis of several thousand laboratory analyses of blood and urine, reached the conclusion that a substantial number of deviations had occurred even before the phenol discharge. Consequently, the general ambience is unhealthy in and of itself. What we consider the norm turned out to be a "defective" norm. And it is not just 1,500 children with acute conditions, but literally everyone, whose health needs to be improved."

"Unfortunately, there is no scientifically substantiated system for improving the health of the city's young citizens. Everything that is done by the health care agencies is done intuitively. We are spending millions, for example, on providing vitamin supplements for children's diets. And at the same time their intoxication by certain unidentified substances is continuing.

"Children's nutrition has turned into a difficult problem. Yet many mothers have no opportunity to buy sufficient vegetables and fruits. One cannot speak about the normal consumption of meat and fish, either. Irrational nutrition is what leads to anemia among nursing mothers."

What the public health specialists have told us is common knowledge. Let us hope that society will some day get through the present crisis, and that children may become healthy and rosy-cheeked. In the meantime, it seems that the nature of motherhood itself is choosing the most rational solution in the given situation: rather than subject one's flesh and blood to the risk of poising, malnutrition, disease and stress, it is better to hold up the "purchase" of a child until better times.

Only, won't we have to wait too long?

Belorussian Potash Mining Pollutes Ukraine's Rivers

92WN0028A Kiev MOLOD UKRAYINY in Ukrainian 6 Sep 91 p 2

[Article by V. Karmazin, chairman of the board of the Welfare Foundation, leader of the "Dnepr—Danube-21" expedition, under the rubric: "Ecology: As Though on Military Duty"]

[Text] Near Korosten in Zhitomir Oblast gasoline gushed in a fountain from a broken gas pipe with a flow of several cubic meters per second. Over twelve hours tens of thousands of tons of fuel poured out. The consequences of the ecological catastrophe cannot be foreseen. But the strangest thing is that ecological accidents, which in terms of scale could be called an ecological catastrophes, no longer surprise the responsible people. The gasoline fouled fertile earth, and some of it ended up in the Uzh river, which flows into the Kiev reservoir. Employees on the gasoline pipeline took some kind of action and built a dike, which will help.

Let us look at a map. The Sluch and Moroch rivers and many smaller streams come together in this region. There are numerous swamps which feed the Dnepr. These are the water sources for both Belorussia and the Ukraine. Everything which has happened here will soon have an effect on the state of the entire southern European portion of the Union.

One is reminded of the Odessa story of the ruined drainage reservoir and the disastrous release of sewage in the area of Novorossiysk. The consequences of the accident are terrible.

The Bashkir accident on the all-product oil-line shook the country, even as the human victims turned attention for a certain period of time from the ecological aspect of the catastrophe... There was also the leak in the sludge-settling pit at the Stebnik fields when a portion of the railway was washed away, fish were killed in the Dnestr, and contaminants settled to the bottom of the reservoirs for the Dnestrovsk and Dubossary hydroelectric power stations. The tragedy at Soligorsk may even be substantially more ruinous than the Stebnik one.

The production of potash fertilizers, which has been going on close to 30 years in Belorussia, is on a much broader scale than Stebnik. The "Biloruskaliy" [Belorussian potash] production association opened in 1949 and began exploitation of the Starobinskyy basin of potash fertilizers (the Pripyat potassium basin), and this gave life to the city of Soligorsk. The area of the basin is gigantic—almost 14,000 square km. It exists within the borders of three oblasts—Minsk, Mogilev, and Gomel Oblasts. The total geologic reserves are close to 50 billion tons. "Biloruskaliy" has almost half of the Union's total output of potash fertilizers. Horizons of potash cover an area of from 500 to 2,500 square km. The depth of the bed is from 350 to 2,000 and more meters.

I have had the opportunity to fly more than once over the territory of the Pripyat potassium basin. There are enormous black lakes of salt slush and mountains of discarded topsoil—a genuine moonscape. The salinity threatens a great portion of the Dnepr basin. Standing near the reservoirs of sludge, it seemed to me that the earth was resisting with all its might. It was as though one could hear its labored breathing. But it will not endure for long. The dams of the reservoir may collapse from the settling of the upper soil (because of mining operations), and a gigantic flow of sludge may reach the Dnepr by way of the Sluch and Pripyat rivers. The Chernobyl zone with its radioactive precipitates is on this route.

During one of the stages of the "Dnepr—Danube-21" expedition we examined the region of "Biloruskaliy's" activity and shot part of the film: "To Save the Dnepr Means To Save Mankind."

...There was a leak. And not just one. Each year 40 million tons of ore are processed. Eighty percent of the potassium chloride is extracted from it. The rest goes into the sludge collectors and salt mounds. We were told that there is a woman who walks to the sludge dams each

day and examines them: How long until a tragedy? It is supposed to be a visual examination.

We reflect that such "rounds" do not mean anything if only because even our photography group needed several hours in a military jeep for the same thing. We did not, of course, meet that woman who was walking about the territory. We wondered who double-checks and supervises her.

"What is the area of the waste accumulation?" I asked Oleksiy Ivanovych Matskevych, chief surveyor of mine administration No. 2 of the "Biloruskaliy" production association.

The response astonished me.

"I do not know, it would have to be calculated."

We calculated it together—in longhand—and there was no other intellectual confirmation. We measured the scale of "Biloruskaliy's" pressure, so to say, on the environment with a common grade-school ruler.

It turned out that two mine administrations used up 350 hectares for accumulation of sludge and that another two used up just as much. In addition to "Biloruskaliy's" four mine administrations there are an equal number of potash plants...

It is spreading over land near villages, buildings are being torn down, coffins are being unearthed from cemeteries...

The land will not produce, it "mangles" the potatoes. In the autumn swans, geese, and ducks land on the mirrors of the sludge-settling pits and, burning their legs, die.

People grow ill with allergies and pant from coughing.

Before it is too late we must apply the most decisive measures—we must build a dam.

Let us consider the following ominous data—we lag behind the industrial developed countries in the level of safety of our technology by a factor of 5-10.

Among the developed nations Japan was the first to approach ecological catastrophe—because the limited amount of area and the high population density. It approached catastrophe and then retreated from it. Today Japan has established effective state control over the ecological condition of the environment.

Our own environmental organs are almost paralyzed by inaction, and the result is talk of a general nature. We must shelter ourselves from planned and unplanned ecological catastrophes. And in this process we need to demonstrate great responsibility. As though we were on military duty.

Sevastopol Faces 'Critical' Water Shortage

92WN0102B Moscow NEZAVISIMAYA GAZETA in Russian 24 Oct 91 p 6

[Report by Vera Kondratenko: "Sevastopol Is Short of Water"]

[Text] **Water From the Dnepr Is Unfit To Drink, Experts Believe**

With the first rays of sun and even before, the inhabitants of the southern Crimean city of Sevastopol rush to the water faucets in order to save water for the day: In an hour it will be switched off for the entire day, until the following morning. When one arrives at a hotel the first thing they explain is when they will be able to collect water for a bath, and make it last for the day. This kind of strict water regime has been in force in this city on the banks of the Black Sea since March 1991.

"The situation with water is now critical." This is the comment of Valeriy Maltsev, deputy chairman of the city executive committee and chairman of the city emergency water committee, on what is happening. "Today Sevastopol consumes 200,000 cubic meters of water every 24 hours. Half of that goes for the needs of the population, 11 percent is used by industry, which is operating largely by recycling its water, and the rest is used by the municipal and everyday sphere. For round-the-clock supplies the city would need 430,000 cubic meters of water. This quantity cannot come from the artesian wells and surface water."

Today there is no other solution to the problem other than bringing water from the Dnepr through the Severo-Krym Canal.

While they were making up their minds about using water from the Dnepr a regular set of tests by the sanitation and epidemiologic station discovered cholera vibrio in it. This is a variation of the El Tor cholera pathogen. The cholera vibrio was sent for study at the Crimea anti-plague station.

This, however, was not the end of the matter. Many scientists and competent experts believe that the water of the Dnepr is unfit to drink for a number of reasons. Thus, for example, Yuriy Gorbenko, department chief at the Institute of the Biology of the Southern Seas, doctor of biological sciences, and member of Sevastopol's ecological commission, calls this water nothing but "weak poison." To confirm this he cites the following facts. In Kerch, from which this water was fed 15 years ago, the number of cancer cases after its use rose 40 percent.

Children are especially at risk: There are now 2,000 cases of illness for each 1,000 children. That is, each child suffers from two or more diseases. When they started to discover the reasons for this it turned out that since the Chernobyl accident the water of the Dnepr has been strongly contaminated with radionuclides. It also contains the salts of heavy metals and other impurities. If one familiarizes oneself with the data from the latest

studies of the water, it can be seen that they indicate contamination with chemical substances and industrial and agricultural waste.

In the opinion of Yuriy Gorbenko, a similar expert ecological examination should be conducted by a non-departmental commission for a minimum of two or three years or even longer. These requirements have not been observed and so there can be no question of any kind of scientifically sound results from this expert examination, to which the country leaders are so fond of referring.

The sanitation and epidemiologic station for Sevastopol is not giving permission to use the water of the Dnepr in the city network. Notwithstanding, the local authorities, accelerating in every way possible the work to bring this water to Sevastopol, are not in such a hurry to look for sources locally and make rational use of them.

Meetings are being held in Sevastopol and signatures are being collected against bringing water from the Dnepr into Sevastopol. Representatives of the public insist that a city referendum be held on the issue. The inhabitants of Sevastopol are collecting voluntary donations and doing reconnaissance work to find local sources of drinking water as alternatives to the Dnepr source.

Topography Contributes to Pollution in Alma-Ata

PM2210085391 Moscow Central Television First Program Network in Russian 1000 GMT 19 Oct 91

[From the "Krest Novosti" program: Report by Andrey Karpov, identified by caption]

[Text] [Karpov] The Kazakh capital is one of the top 10 cities in the country when it comes to air pollution. Almost 200,000 tonnes of noxious substances are emitted into the atmosphere every year—motor transport alone accounts for 120,000 tonnes. We're here at the Kazgidromet's Atmospheric Air Laboratory. Staff at this laboratory have established that the amount of benzopyrene and carbon monoxide present in the atmosphere is 13 times higher than permitted safety levels. Moreover, people are breathing in lead, copper, and dust in quantities five times above health-safety levels. The Kazakh capital is by no means an industrial city, but in terms of air pollution it now stands alongside such industrial monsters as Donetsk, Chelyabinsk, and Kemerovo. Specialists claim that the annual damage done by harmful emissions in Alma-Ata amounts to 70 million rubles. Are there really as many vehicles in Alma-Ata today as there used to be sultans? No, the point is that the city is located in a kind of depression. It's ringed on every side by mountains which present a barrier to natural ventilation. Sometimes the smog gets so thick that you can't see the mountains from the city or the city from the mountains. A few years ago the Japanese proposed a scheme to open up a gap in this ring to allow fresh air in. But the authorities rejected the project.

Aral Sea Plan Seeks Stabilization at Current Levels

92WN0058A Tashkent PRAVDA VOSTOKA in Russian 24 Jul 91 p 3

[Article by M. V. Mukhamedzhanov, chairman of the Uzbek National UNESCO Committee for the Man and the Biosphere Program and UzSSR Academy of Sciences member: "The Aral Sea Can Be Saved"]

[Text] *From among the studies presented in the Aral Sea competition sponsored by the USSR State Committee for Environmental Protection a jury selected the seven best, including a concept for preserving and restoring the dying sea created by Tashkent scientists M. V. Mukhamedzhanov, S. Sh. Mirzayev and A. A. Rachinskiy. Today we present that concept to our readers in abridged form.*

Before stating my viewpoint on this problem, I would first of all like to give an overview of the Aral Sea's present condition.

The desiccation of the Aral Sea is occurring as a result of serious miscalculations and mistakes made during the stagnation period by the heads of the water management and agricultural organs of the USSR, the Central Asian republics and Kazakhstan, as well as by party and soviet organizations. Agriculture and water resource management were developed on an unscientific basis, in an extensive manner which did not take the availability of water resources into account. The region witnessed an excessive expansion of irrigated areas onto poorly suited or unsuitable land, establishment of a cotton monoculture and construction of a large number of necessary and unnecessary reservoirs and other water management facilities. As a result the sea's surface level fell, the sea's total area was reduced sharply and its volume decreased by a factor of three. The Aral region's climate changed markedly: winters became colder and summers hotter. The sea and the rivers which fed it virtually ceased to have any significance as fishing areas, industrial water sources or transport routes. Approximately 2.5 million hectares around the Aral Sea have been transformed into arid salt flats.

According to experts' calculations there are approximately 10-11 billion metric tons of salt in the sea, of which 90-100 million metric tons are lifted up into the air each year and dispersed by the wind, with some of this salty sand falling as far away as the Pamirs.

Catastrophic disruption of the ecological balance has occurred in the Aral region as a result of the sea drying up.

If urgent measures are not taken to preserve the Aral Sea it will be completely lost as a natural site, with all the resultant severe consequences for the region and in particular for the four million people who live in regions adjoining the sea.

The question arises: at what level should the Aral Sea be preserved, and how?

It is no longer possible to return the Aral Sea to its 1960 level. In order to do that the entire flow of both our rivers would have to be channeled into the Aral Sea for several years, with no water at all used for irrigation.

That is impossible. But it is possible and necessary to maintain the sea at its present level, at the 38-40-meter mark; this will ensure that it continues to exist as a natural site with a smaller basin.

From its entire surface the Aral Sea loses 30-35 cubic km of water annually through evaporation. Consequently, in order to maintain it at its present level an equal amount of water must be put into it each year.

Many scientists, experts and officials in water resource management and agriculture in the Central Asian republics and Kazakhstan have for a number of years been persistently promoting the idea of bringing in water from outside, specifically by diverting water from Siberian rivers or even from the Caspian Sea. In essence we support that proposal. But this will require the conducting of comprehensive studies. The plans for interbasin redistribution of water which presently exist are not scientifically justified. We must have basic research on alternative means of supplying water to the Aral Sea basin. Furthermore, the RSFSR has expressed its opposition to any transfer of water.

Under these conditions it would be highly problematic to count on restoration of the Aral Sea through water redistribution, especially since even if this plan were given the go-ahead the water would not reach the Aral Sea for 20-25 years. By that time the sea will have disappeared completely.

That is why the only way to maintain the Aral Sea in its present condition is to find 30-35 cubic km of water in the region from which water now flows into the sea each year. But how can that be done?

We must focus our attention mainly on realization of a series of measures aimed at radical improvement in the condition of all land presently irrigated, in particular on improvement and reconstruction of irrigation and land reclamation systems, land planning, optimization of irrigation grid size, soil desalination, development and application of water-conserving technologies in agriculture, improvement of soil fertility, and so on. All these matters must be discussed thoroughly and resolved rationally, with full consideration given to ecological, economic and social consequences.

In order to reduce seepage of water into the subsoil many experts are recommending that irrigation canals and even the smaller irrigation networks be lined with concrete. We do not share that opinion. What is needed is a differentiated approach and consideration for specific circumstances. Concrete linings are definitely necessary in places where canals and the irrigation network pass through thick layers of gravel and sand, where the amount of seepage and water loss is very substantial; in other places, which are must more numerous, particularly in fine-grained soils, a concrete lining is not only useless, it is actually harmful. By lining canals and irrigation ditches in the fields with concrete man would be interfering with nature in a major way and disrupting the balance of water in the soil and the microclimate in local areas.

Some seepage of water from irrigation systems into the subsoil is necessary to balance the level and quantity of water in the soil. It is a well-known fact that a groundwater level that is too deep will require frequent waterings, heavy water usage and additional effort to care for plantings. The borders of canals and all small irrigation networks should be planted in trees, including fruit trees. Concrete linings preclude this.

It would be difficult to overestimate the importance of trees in our arid zone. Through their roots they serve as pumps which draw water from the deep subsoil water and transpire it through their leaves, improving the microclimate of the entire area, cleaning the air and on intensely hot days protecting plantings from the harmful effects of wind and the *garmsel* [hot, dry desert wind] reducing the amount of water used for irrigation and the amount of salts in the soil, preventing soil erosion, attracting birds and making increase in their numbers possible; the latter is of great importance in the biological struggle against agricultural pests. All this is of tremendous ecological, economic and social significance.

Optimization of irrigation parcel size is an important matter. In the old irrigation zone parcel size often reaches 25-30 hectares, but in the newly-developed areas parcels are 40-50 hectares, and sometimes as much as 100 hectares. The length of the parcel reaches 1.0-1.5 km, and the length of the irrigation furrows may be 400-500 meters or more. Under these conditions it is clearly impossible to monitor the status of irrigation and moisten a field evenly. These grids use more water by factors of three or four. Consequently these large parcels should be broken up into smaller ones. Yet at the same time we have many parcels which are only 1.0-1.5 hectares in area. There are particularly many parcels of this size in the Fergana Valley oblasts. Those parcels should be expanded to the optimum size.

Optimum size for irrigation parcels in regions with strong winds is 4-6 hectares, and in other areas 8-12 hectares. Furthermore, the edges of all parcels regardless of size should be planted in two rows of fruit-bearing and timber-producing species of trees.

Also worthy of broad application is irrigation by means of inter-row channels, performed with the same furrows up to the end of the growing season. These help maintain soil porosity and reduce soil erosion, speed maturation and increase cotton yield, and most importantly save 15-20 percent of the irrigation water used.

Worthy of attention among the latest techniques to help conserve water with each watering of vegetation is loosening of soil to a depth of 60-80 centimeters and deep tilling of alfalfa to a depth of 50-60 centimeters, done once very 7-10 years.

Our research has determined that on the order of 2,500-3,500 cubic meters of water are used each growing season to obtain a 30-40-hundredweight cotton harvest per hectare in hydromorphic soils, and in sierozems with a deep groundwater level this amount rises to 5,000 cubic meters. If one considers that water losses between irrigation sources and the fields are 30 percent and that an equal amount goes for flushing and reserve waterings, then the average amount of water used per hectare is 6,000-7,000 cubic meters. In actuality the unit use of water per hectare throughout Uzbekistan is presently 12,500 cubic meters per hectare. Water use is roughly the same in the other republics in the Aral Sea region. As we can see, almost twice as much water is being used for irrigation as is necessary. In other words, with a total annual flow of 115-120 cubic km into the Aral Sea basin and water diversion totalling 90-100 cubic km, a total of 45-50 cubic km is being wasted.

Thus with a fundamental change in water resource and agricultural policy and the strictest conservation of water resources in every place and in every way it would be possible to find at least 30-35 cubic km in the affected region and channel it into the Aral Sea, thereby maintaining it in its present state.

In order to do this it is essential that we strictly limit water diversion by the republics and by each farm, that we accelerate the rate at which water-conserving technologies are introduced in all sectors of the economy, and that we consider making farms pay for water use and establish material and moral incentives for water users to conserve.

A reduction of water diversion by each republic by only 15-20 percent would make it possible to channel at least 15 cubic km of water into the Aral Sea.

We must radically reconsider the sector structure and the planting structure. In order to do this we must first and foremost eliminate the last vestiges of monoculture in cotton farming and conduct it on a strictly scientific basis, with proper use of crop rotation everywhere. This will require that the total proportion of cotton sown in the region's cotton-farming complex be reduced from the 1989 level of 68-70 percent to 50 percent.

In the Aral Sea region rice is grown on an area of 300,000-350,000 hectares, of which approximately 160,000 hectares are in Uzbekistan. Most rice is grown by specialized sovkhozes and kolkhozes in Karakalpakistan and Khorezm and Kzyl-Orda oblasts. Rice is the crop which use the greatest amount of water. Each hectare requires 50,000-55,000 cubic meters of water, or more by a factor of five than cotton fields presently do. Moreover, the specialized farms have a low yield. As a result the majority of them are unprofitable or have a low rate of profitability.

We must do away with specialized rice farms and modify them to grow other crops which have greater economic efficiency. In our opinion the area sown to rice in the Aral Sea basin should be reduced by 200,000-230,000 hectares. This will yield almost 10 cubic km of water conservation, thus yielding a major source of replenishment for the sea. The remaining 120,000 hectares of cultivated area should be used for land improvement purposes, as rice is a major means for desalinating soils and ridding them of wilt and other diseases.

As much as 55 cubic km of water are stored in reservoirs within Uzbekistan and shared with other republics, and of this amount over five cubic km evaporate uselessly. This is where we see a failure on the part of water resource and agricultural organs. There definitely was a need to build certain reservoirs, particularly in the mountains, but there was no reason whatsoever to build the majority of the reservoirs in the foothills, valleys and flatlands, particularly since the construction was done without in-depth and comprehensive scientific study, ignoring the opinions of scientists and specialists, with no consideration whatsoever given to the inevitable degradation of natural conditions or the negative long-range ecological consequences. The fact that the death of the Aral Sea was predetermined was an unforgivable mistake on the part of the former USSR Ministry of Land Reclamation and Water Resources and water resource organs in the Central Asian republics and Kazakhstan.

Reservoirs, especially those such as Andizhan, Karkidon, Tuyamuyun, Shor-Kul, Tuda-Kul, Kopet-Dag, Char-Darya and many others, cause great harm to agricultural output and create to ecological problems. Groundwater rises in all adjoining fields because of the reservoirs, as a result of which the fields become saline and swampy. As a rule the water flowing out of the lower sections of reservoirs is cooler than normal river water. When it is used for irrigation the soil is cooled, sharply reducing the number of or killing altogether many useful microorganisms in the soil and changing the climate; the ecological situation worsens markedly and crop yield declines.

One great shortcoming of reservoirs is the fact that virtually all silt (calculated per hectare, depending upon the river, this equals 20-40 metric tons), rich in micro- and macrocomponents and humus, settles out in the reservoirs, thus depriving irrigated land of one of the most important aspects of structural formation and increased fertility.

It should be taken into account that in the near future many reservoirs will become filled with silt and cease functioning, and over the same period our soils will become completely degraded because they have ceased to receive infusions of silt particles.

In our opinion it would be appropriate to stop storing water in those reservoirs which have caused a marked degradation of the region's land and environment. The remaining reservoirs, with the exception of those which are vitally necessary due to an acute shortage of water or electric power in the region where they are located, should be used from time to time, only in periods of high water flow and in the wintertime. Construction of new reservoirs should be halted.

There is much drainage water in the zones of the Aral Sea region. That water and water from the Daryalik and Ozernoye catch basins should be channeled into the Aral Sea. Necessary measures should also be taken to ensure that drainage water and high-water flows from the Syr-Darya do not drain into the Arnasay-Aydar Depression, but instead are channeled into the Aral Sea. These measures will give the Aral Sea an additional 5-7 cubic km of water.

As one can see from the above, there is a possibility of finding enough water resources within the Aral Sea basin itself to maintain the sea at its present level. That will definitely be a difficult task and will require ambitious efforts by all Union and republic water resource and agricultural organs as well as administrative organs, and the swiftest possible development and implementation of a series of practical measures to preserve the Aral Sea for future generations.

Kazakh President To Lead Project To Save Aral Sea

OW0211161091 Moscow INTERFAX in English 1423 GMT 2 Nov 91

[Following item transmitted via KYODO]

[Text] The Kazakh President Nursultan Nazarbayev will lead a regional committee for saving the Aral Sea, as announced at the session of the "Aral-Asian Caucasus" international committee in Alma-Ata Nov 1 by its chairman, Kazakh Republic's People's Deputy Muhtar Shahanov.

The need of such a regional committee, said Shahanov, is dictated by the fact that the zone of ecological disaster includes four Central Asian republics which will soon receive considerable foreign exchange funds to finance a joint Soviet-Japanese project for saving the drying up Aral Sea. The sums, unspecified yet, are expected from the international organisation Global Infrastructure Fund [GIF] (with a potential assessed at 40 bn dollars - IF [INTERFAX]).

The decision to finance the Aral Project, explained M. Shahanov, was taken at the ecological symposium held in Atlanta, United States, under the auspices of the GIF. A resolution was passed by a majority vote on a global character of the Aral problem. It was also decided to hold next GIF Symposium "on the Soviet territory".

REGIONAL AFFAIRS

USSR Dam Worsens Gulf of Finland Pollution

92WN0092A Helsinki HELSINGIN SANOMAT in Finnish 26 Oct 91 p D1

[Article by Heikki Pitkanen and Timo Tamminen, special investigators of the Water and Environment Research Institute: "St. Petersburg's Wastewater and the Neva Are Eutrophying the Eastern Gulf of Finland"]

[Text] **The large volume of nutrients in the Gulf of Finland is causing algae florescence, and nutrients are accumulating in deep-water areas.**

The eastern end of the Gulf of Finland is one of the most heavily polluted areas in the Baltic. About half of the nutrient load is dumped into the easternmost end of the Gulf of Finland. The Neva produces three-fourths of all the sweet water that flows into the Gulf of Finland. The nutrients discharged into it by the Neva and St. Petersburg are making a permanently eutrophied area of the Neva estuary. The nutrient content of the Gulf of Finland is clearly increasing from west to east.

The most conspicuous cause of the condition of the Gulf of Finland these past few years has certainly been the massive Leningrad Dam project. It is regarded as the biggest threat to the ecosystem of the Gulf of Finland.

The dam is generally viewed as an example of a big technocratic project that is infatuated with bigness and has no concern for the natural environment, which proceeds in its own way.

Varying estimates of the main issue itself, the volume of nutrients emptied into the sea from the Leningrad area and the effects they have on it, are overshadowed by the dam.

The volume of nutrients is the most serious threat to the well-being of the Gulf of Finland and the entire Baltic. The nutrients are eutrophying them—that is, increasing the growth of plant plankton. This is resulting in changes viewed as troublesome by citizens, like slime-covered nets, turbid waters, algae beds, and evil-smelling silt gases.

Until the end of the 1980's, researchers and officials had to base their estimates of the volume of pollutants in the Gulf of Finland and their effects on it in part on guesses. Acording to the latest information, about half of the volume of nutrients in the Gulf of Finland end up in the easternmost end of the Gulf of Finland, in the artificial lake created by the dam.

Scientific observations of the eutrophication of the easternmost end of the Gulf of Finland have been made since as early as 1910. During the past decade, two-thirds of the Gulf of Finland has been a white splotch on scientists' maps.

St. Petersburg and the Neva Are Decisive

Leningrad no longer exists, but St. Petersburg and its large number of Finnic inhabitants continue to exist. The Neva, with a flow equivalent to that of all the rivers that empty into the Baltic from Finnish territory, also continues to flow.

The Neva and St. Petersburg are decisive from the standpoint of the Gulf of Finland. The Neva delivers a fifth of all of the sweet water that flows into the Baltic and three-fourths of all of it that flows into the Gulf of Finland.

Since sweet water is lighter than Baltic water, the flow of the former can be seen at the level of the entire Gulf of Finland.

Therefore, the Gulf of Finland functions under the influence of the Neva. There is no well-established word in Finnish like the one that is used to describe areas like this elsewhere in the world: *estuary.*

It is not a delta but a considerably larger area of the sea that is under the influence of river water.

We can more precisely delimit the Neva estuary as being an area of the sea extending from an imaginary line connecting Seiskari and Koivisto to the delta.

As far as the movements of masses of seawater from place to place are concerned, they dictate the conditions under which water organisms benefit from nutrients in the depths of the sea.

This is particularly important in the easternmost end of the Gulf of Finland. St. Petersburg and the Neva deliver more nutrients there than get into the Baltic from all of Finland.

Muikku and Aranda Head East

Even before Leningrad became St. Petersburg, the times began to change. The Water and Environment Ministry research ship Muikku and the Marine Research Institute's Aranda received permission to take samples from Soviet territorial waters at the end of summer 1990.

The Muikku crossed the territorial waters border at dawn on 19 August and took the first samples for a Finnish research ship since the 1930's. Lasting over a week, the research trip led them in zigzag fashion to the front of the dam and back. Thirteen of the sample-collection points were located in Soviet territorial waters.

The Aranda soon followed it and picked up samples from five collection points. Since the latter part of the year, the Aranda has returned once again for the purpose of joint Finnish-Russian-Estonian charting of the Gulf of Finland.

The Muikku and the Aranda extended their studies this summer. The preliminary results are now clear. A general picture of the chief features of the Eastern Gulf of Finland ecosystem is taking shape. The picture still needs a lot of clarification.

Neva Estuary Is Trap for Nutrients

The large numbers of different kinds of plankton organisms—especially blue-green algae—found throughout the entire estuary area and the high nutrient content of those water layers close to the bottom were the most striking observations.

The nutrient content of the minerals at sample-collection points in front of the dam was also especially high and the percentage of nitrogen nearly 100 times greater in the surface waters in comparison with areas farther out to sea.

The large numbers of different kinds of plankton are based on their effective exploitation of the mineral nutrients in the well-lit surface layer. The nutrients discharged by the Neva and St. Petersburg are making a permanently eutrophied area of the estuary, which represents a 10th of the entire surface area of the Gulf of Finland.

These large numbers of plankton cause the volume of nutrients absorbed by organisms to sink and settle in deeper water layers relatively rapidly. The increase in salt content when water layers mingle also speeds up settling. Thus, some sweet-water organisms die.

The nutrients that settle to the bottom are not, however, completely eliminated from the ecosystem cycle. The flow conditions of the estuary cause part of the repository of nutrients of the deeper layers to quickly return again to the surface layer, to be used by the plant plankton. The bottom current that enters the Neva estuary from the west especially raises the water's phosphorus content. The material that settles to the bottom releases a great deal of mineral nitrogen.

These vast reserves of nutrients, which contain considerably larger amounts of nitrogen in the western parts of the Gulf of Finland, mingle with the surface waters over and over again.

Effects of Dam

The results obtained in 1990 indicate that only a very small portion of the volume of nutrients is retained in the inner side of the dam. The samples taken from the dam reservoir in the summer of 1991 support this impression.

Therefore, most of the pollutants end up in the Gulf of Finland, the dam notwithstanding. The reason for the slight effect the dam has is obvious: It is chiefly the lack of light that limits plankton production and the consumption of nutrients in the inner side of the dam.

In spite of its size, the dam reservoir is very shallow (mostly 2-5 meters deep). The water is turbid because of the strong currents. Nor does the turbidity of the river have time to subside because, thanks to a large flow volume, the water of the dam reservoir is renewed on the average of less than a week's time.

In the Finnish observations, they note that the nutrient content of the Gulf of Finland sharply increases as one moves from west to east. The same areal distribution is evident in the eutrophication of the surface layers.

The volume that comes from the St. Petersburg area is about half of the total volume of nutrients in the Gulf of Finland. Thus, the results with respect to the eutrophication of the easternmost end of the Gulf of Finland did not come as a surprise.

What is new, however, is a revised picture of the nutrient dynamics of the Neva estuary ecosystem. We may preliminarily estimate the effects of the volume of nutrients in the St. Petersburg area at the level of the entire Gulf of Finland.

In winter, biological production does not exhaust the nutrients. Then the volume of nutrients from St. Petersburg and the Neva also accumulates in the surface waters and spreads to Finland's territorial waters under the ice, as has already been noted in observations of the coastal waters under the jurisdiction of the Kymi Water and Environment District. In summer, the nutrients circulate actively in the Neva estuary. The direct effects of the wastewater can probably only rarely be observed outside the estuary area.

It may be roughly estimated that the total reserve of nitrogen in the St. Petersburg area will double in one or two years if the volume of nutrients in the area mingles steadily with the Gulf of Finland. It would take two or three years for this to happen with the phosphorus reserve.

However, because nutrients supplied by industry in the area do not double within a few years' time, the elimination of the nutrients is very effective.

Phosphorus settles permanently on the bottom, despite the active circulation of the water. Nitrogen is also deoxidized into a gas that escapes into the atmosphere. In winter, especially, the nutrients are removed from the estuary along with the currents to end up in the Northern Baltic.

Florescence Increasing

So, the volume of nutrients from St. Petersburg and the Neva poses a clear-cut threat to [the Baltic] outside of the estuary, too. A disturbing development is apparent in the estuary, of which there are already clear indications in the western part of the Gulf of Finland. Growing numbers of nutrients, especially nitrogen, are accumulating on the underside of the productive surface layer.

In early spring, when the waters are cold, the waters of the Gulf of Finland mingle in the depths. The annual spring florescence is constantly increasing thanks to the growing numbers of nutrients.

While the surface layer is clearly separated from the deeper, nutrient-rich water layers during the productive summer season, the currents that depend on weather conditions can also at times mix layers together with one another in summer.

Such eruptions, which cannot be predicted as can regular florescence, bring increasingly greater numbers of nutrients—greater numbers than what moves in a more easterly direction—to the surface in the Gulf of Finland area.

Exceptional algae florescence has been observed in late summer and in fall over the past few years offshore of Kotka. It is caused primarily by the mingling of water layers containing nutrients with surface waters.

It has been shown that nitrogen is the chief nutrient that promotes florescence in the western parts of the Gulf of Finland.

The whole ecosystem of the Gulf of Finland is developing at a faster pace than before. The seed of many surprise florescences lies concealed in the constantly increasing amount of nitrogen in the deeper water layers.

The known level of eutrophication is gradually moving from east to west. The volume of nutrients in the Gulf of Finland should be sharply reduced—also the half of it that is directed from the reservoir to the other side of the dam.

Otherwise, we can only expect nutrient reserves and the level of eutrophication to increase. The present nutrient reserves will do just fine to produce unpleasant surprises.

Nordic Environmental Toxicology Training Program To Be Initiated

92WN0092B Helsinki HELSINGIN SANOMAT in Finnish 27 Oct 91 p 5

[Unattributed article: "Nordic Training Program for Environmental Toxicology"]

[Text] The risks of Nordic environmental problems will begin to be evaluated with an extended environmental toxicology training program to start next fall. Environmental researchers, who will also try to provide undustry with new information on the effects of toxic substances on the environment, will participate in training sessions to be organized in the different Nordic countries in turn. The University of Kuopio Training and Development Center is applying for funding of the three-year program from the Nordic Council of Ministers.

CYPRUS

EC Commission Provides Funds for Coastal Area Environmental Projects

NC0111062591 Nicosia CYPRUS MAIL in English 31 Oct 91 p 4

[Text] The EC Commission has provided 225,000 pounds to finance a Ministry of Communications and Works project to protect the Island's coastal areas.

Director of Finance for Environmental projects of the EEC, Claude Pleinevaux [name, title as published] announced this approval yesterday. He said it was part of an EEC programme to protect the environment in the Mediterranean, which is under the auspices of the Mediterranean Special Programme Action.

The money will be spent on a study which will cover the effects of pollution and construction in all coastal areas including Akamas.

Problems which now exist include the building of sea barriers by hotels which has changed the movement of the sea and heavy building construction on the coast, as in Limassol, which has eroded the sandy beaches.

The money will help the government in getting technical assistance and expert advice on environmental problems.

FRANCE

Peugeot Presents Environmental Plan

92WS0003X Paris AFP SCIENCES in French 12 Sep 91 p 63

[Unattributed article: "Peugeot S.A. Group's Environmental Plan"]

[Text] Paris—In Paris on 5 September, the Peugeot S.A. automobile group presented an environmental plan "responding to the government's desire to see the industrial enterprises match the National Environmental Plan presented by Mr. Brice Lalonde last October."

The plan is based, according to the automobile manufacturer, "on the principle of preventing pollution at the source," and addresses, first of all, the action programs at the manufacturing sites, especially from the standpoint of reducing the waste products in the atmosphere by limiting specific emissions in iron and steel foundries, using alternative fuels to reduce the sulfur dioxide content of emissions in thermal plants, and reducing the emission of solvents issuing from paint shops. The plan also provides for the regulation of water consumption, biological treatment of waste water, and the monitoring of liquid wastes.

The plan includes six programs of action on products, aimed at achieving a "clean car," primarily by reducing exhaust system emissions through the optimization of

present-day techniques such as the catalytic converter, through research on less-traditional techniques such as two-cycle engines, hydrogen and new fuels. Other objectives include: A "temperate" car, through a reduction of fuel consumption under a 2.5-billion-franc program; and a "silent" car, through a reduction of power-unit noise.

Peugeot also presented a prototype of the Peugeot 405, a heavy-duty station wagon powered by an electric generator set that provides a greater cruising radius than does the use of batteries (100 km). The Peugeot group further indicated that it intends to propose to the Brussels Commission a new approach to the antipollution regulatory process, based on adherence by every manufacturer to a norm to be set, not model by model as at present, but in terms of a mean for the vehicles sold on the European market.

Financial Problems Hamper Water Purification Initiatives

92WN0080A Paris LE NOUVEL ECONOMISTE in French Oct 91 p 104

[Article by Pierre de Gasquet: "Water Worth the Price of Gold"]

[Text] "Absolute insanity!" Any tax proposed on nitrates is rejected in these precise terms by Philippe Mangin, president of the National Young Farmers Center (CNJA), on the eve of discussion of the new "water law" in the Senate. Nor can there be any question of accepting application of the "polluter-payer" principle to "pollution of diffuse origin" engendered by fertilizers or pesticides at the very time when dissatisfaction among farmers is at an all-time high. Where is one to find the financial means to revive a policy aimed at preserving water quality that would result in doubled prices by the year 2000?

In view of how far France lags behind the rest of Europe in terms of purifying water—only 52 percent of the population is hooked up to a purification station compared with 90 percent in Germany and 98 percent in Denmark—the Cabinet meeting on 19 June 1991 had already decided on the principle of doubled investments by the six basin agencies over the next 5 years. The package of 44 billion francs [Fr] (for the 1987-91 period) will be succeeded by a more ambitious program of Fr81 billion for 1992-96. Some Fr43 billion would be devoted to domestic water purification in accordance with the European directive, Fr15 billion for the drinking water system and backup, and Fr11 billion for the fight against industrial pollution. This is the goal of Environmental Minister Brice Lalonde, whose police and water management law has been on the Senate's desk since 16 September: "ranking among European leaders in terms of quality," even if the Bonn government does plan to spend Fr35 billion a year to raise the water quality of communities in the former German Democratic Republic to the West German level.

All is fair in garnering the very substantial funds needed to improve collection systems and build purification stations under the aegis of basin agencies. One regulation would turn "responsibility over to farmers" by setting up a graduated scale of fees on nitrates, this to the great detriment of agricultural organizations which mainly view it as an expeditious manner of filling the coffers of basin agencies through the bias of a repressive system. To fight industrial pollution, other draft texts provide new fees on waste from chlorinated products, particularly widespread in chemistry, the paper industry, and dyeworks, or even a tax on metals (cadmium, zinc, arsenic, and so on), aimed at doubling the revenue of agencies from toxic waste.

The main polluter—payer will rapidly learn its limits. Indeed, "user efforts must be accompanied by a corresponding effort from the government, which has gone overboard on disengaging itself financially from the water policy," Senators Jean Faure and Richard Pouille believe. However, in order to implement Lalonde's plan, "doubling the price of water is unavoidable in the years ahead," they add. With an average price of Fr5.48 per cubic meter, France already ranks third in Europe behind West Germany and Italy, according to the latest poll of the National Utility Service (NUS), which specializes in analyzing business energy bills. Sanitation and cleanup taxes included, it is in Lyon (Fr10.98 per cubic meter) that consumers pay the most for water, NUS says, while Parisians, charged Fr6.83 per cubic meter, get the best bargain.

New Storage Center for Nuclear Waste

92WN0047A Paris LE MONDE in French 10 Oct 91 p 13

[Article by Jean-Francois Augereau: "One Million Cubic Meters of Radioactive Waste Will Be Stored at Aube"]

[Text] Located about 50 km east of Troyes, the Aube storage center should receive its first "packages" of low-level and moderately radioactive waste between now and the end of the year. The center will gradually replace the Manche center, which is set to close in 1994, and will serve as the storage site for 1 million cubic meters of material between now and the year 2020.

Soulaines-Dhuys (Aube)—Wedged between the departments of Aube and Haute-Marne, the new Soulaines-Dhuys radioactive waste storage center scarcely draws attention to itself. You find it perched atop a small wooded hill surrounded by forest, at the end of a sort of avenue crisscrossed by country roads. It is an immense man-made clearing: a hundred hectares of land, about one-third of which is to receive its first packages of waste by the end of the year.

The first storage silos with their absurd gray-and-red roofs are already prepared to receive their dangerous consignments. The center at Manche is almost choking in its 500,000 cubic meters of waste. So from now on

20-30,000 cubic meters of low- and medium-radioactivity waste, most of it (97 percent) from French nuclear power stations, will be coming to Soulaines each year to be processed: tools, filters, gloves, boots and plastic sheets contaminated by radioactivity. The other 3 percent will include all the waste produced by hospitals, research centers and pharmaceutical laboratories that use radioactive substances in cancer treatment, sterilization and measuring instruments.

Three Centuries

Obviously, all this waste is not just going to be dumped in a pile here or allowed to contaminate the environment. The National Agency for Radioactive Waste Management (ANDRA) plans to sort out, process and package the waste for storage in airtight concrete silos, each of which is capable of holding slightly more than 3,000 cubic meters of material.

As each silo fills up, the spaces between the drums of waste will be filled with concrete or gravel. Once the silo is full, it will be sealed with a concrete slab and covered with a layer of plastic to ensure it remains leakproof—from now until the year 2020[1], by which time a total of 1 million cubic meters will be in storage.

Gradually, the various silos will be filled up and eventually covered over with a sort of thick sandwich consisting of two layers of clay and asphalt and a final layer of loam, which will then be seeded. This abundance of precautions is not an extravagance, because this "waste cemetery" must be built to last—for three centuries. That is the time it takes for the radioactivity in the short-lived products such as cesium and strontium which will be stored here to decrease by a factor of 1,000 and thus no longer pose a threat to the environment.

Some people are troubled by the length of the required containment period, a period almost on the scale of geologic time. According to Henri-Edme Wallard, ANDRA's just-installed new director, "that is why we must demonstrate that the wastes are being treated and managed on a day-in, day-out basis. We must have the courage to call it waste. All too often waste is associated in people's minds with operations of doubtful quality; it is up to us to change that, to gain recognition for waste management as an honorable profession. For that, we must reach out and communicate with the widest possible audience, instead of treating it merely from a technician's point of view and forgetting we will be part of this region's environment for some centuries."

Integration

So the center must somehow be integrated into the life of the community. The ecologists are not exactly pleased with this cohabitation, but acceptance has been and will continue to be facilitated by the 34 million French francs [Fr] of "companion measures" appropriated to assist the department and the surrounding villages (about 8,000 people), and by the Fr9 million in business taxes to come.[2]

All the same, no one here is exactly jumping for joy, though as far back as 1987 one elected official from the region opined that creation of the storage center site was "an opportunity that should be grasped" in order to "arrest the region's 150-year decline."

Footnotes

1. ANDRA believes the site must be managed carefully and the volume of waste added each year must be kept to a minimum. This policy is already beginning to be implemented. The Soulaines center could therefore be in operation out to the year 2030.

2. The Fr1.2 billion facility has created 150 jobs, directly and indirectly, and the great majority of new employees are local hires.

Proposals for New Waste Policy Outlined

92WN0098A Paris LE MONDE in French 26 Oct 91 p 9

[Article by Roger Cans: "Twenty Proposals for a New Waste Policy"]

[Text] **The studies and reports to promote a new waste policy are stacking up. After the Destot report on industrial waste, followed by the Riboud report on packaging materials, another on the policy for recycling packaging waste, signed by the Saint-Gobain president Mr. Jean-Louis Beffa, will be presented by Mr. Brice Lalonde on 30 October. Moreover, the parliamentary report of the task force on waste treatment and recycling was presented Thursday, 24 October by its president, Mr. Jean-Marie Bockel, on behalf of the production and trade committee. The report enumerates a series of twenty propositions.**

If the parliament and government heed the recommendations of the mayor of Mulhouse, the era of anarchic waste disposal in France will be over. After a year-long investigation undertaken with nine other deputies belonging to all the political groups, the latter has drawn up a list of reforms to improve the 1975 waste law. The proposals can be boiled down to twenty:

1) Responsibility for household waste management would be given to departments; industrial waste management would fall to the regions. Departmental and regional plans would be drafted in consultation with elected officials, associations, industry professionals, and the state.

2) The state would be responsible for managing special, toxic, or dangerous waste, and would elaborate a national plan approved by decree in the State Council.

3) It is proposed that industry professionals sign a national storage center charter with the state; the charter will spell out the rules for the operation and inspection of disposal sites and, notably, the financial guarantees for their long-term monitoring.

4) To eliminate the "trouble spots" (illegal dumping grounds and industrial wastelands whose soil is contaminated), the establishment of a pluriannual rehabilitation program is proposed. It would cost at least 40 million French francs [Fr] a year.

5) To forestall popular resistence (the "NIMBY", or not in my backyard, syndrome), the shipment of household garbage across borders would eventually be banned. Industrial waste, on the other hand, would continue to be exported or imported depending on where the most suitable disposal sites could be found.

6) After lengthy debate, the task force has finally rallied to the dumping tax proposed by Mr. Brice Lalonde, as a way of financing the new policy. It sees it as having "the advantage of simplicity, despite some problems in practical implementation." The tax, set at Fr20 a metric ton, would be managed by the Environmental Agency and the energy authority (ADEN [expansion unknown]) and would apply to all disposal sites.

7) The task force also proposes the setting up of a departmental fund for the management of household waste. This fund to supplement the investments of local collectivities would be a mutual fund paid for by commune contributions, prorated for the number of inhabitants or waste tonnage produced.

8) To compensate the communes or nearby residents that agree to the installation of a class-I industrial waste site, the Bockel task force proposes establishing "operator financial contributions", whose amount per metric ton would be set by ministerial decree.

9) It is proposed that waste taxes be brought in line with water management ones. The VAT [value-added tax] rate would thus be dropped to 5.5 percent for storage, treatment, or recycling installations.

10) To assist collectivities in recycling, it is proposed that the financial support that will be asked of packaging producers be extended to other forms of waste. Those targeted in this way would include manufacturers of tires, batteries, plastic films for agricultural use, printing paper, etc. Car buyers would pay a deposit that would be reimbursed at the end of the vehicle's life, on presentation of a certificate stating that the car was destroyed as agreed.

11) The parliamentary task force recommends that local information committees for all waste management sites be systematically established, using the local committees to monitor nuclear installations as a model.

12) To guarantee the solvency of disposal site operators—and thus ensure the long-term monitoring of the sites—a security fund based on industry contributions, from both producers and disposers of waste, is proposed.

13) The report asks that an environmental audit be done for all sales of industrial land or waste sites, to avoid affairs such as the Montchanin dumping ground or the Nantes gas factories.

14) To ensure public control of the lands in question, the task force proposes that construction work on a storage or treatment site be able to be declared of public utility, even if the site has to be ceded back later to a private partner. It also suggests giving mayors the power to intervene on these sites in an emergency.

15) The task force asks that transporters of dangerous waste hold prefectural authorizations.

16) Once again, the members of parliament are asking for an increase in the number of classified installation inspectors, who now number 500 (for 500,000 high risk sites).

17) Waste disposal installations should be subject to approval in conformance with the 1975 law. It is proposed that the ceiling on fines to punish those in noncompliance be raised to Fr250,000. Moreover, associations would be qualified to sue in the courts.

18) The Bockel task force suggests that dumping of recyclable materials such as paper, glass, and plastic be gradually banned, thus making it obligatory for communes to collect those materials selectively.

19) The members of parliament would like to see producers of certain dangerous products such as medicines and plant health aids be forced to take them back.

20) Finally, they are requesting that a national observatory and national waster research network be established, under the aegis of ADEN.

GERMANY

New Technologies for Saving Fuel Consumption Examined

91WS0504X Duesseldorf VDI NACHRICHTEN in German No 31, 2 Aug 91 p 1

[Article by Mario Cikanek: "Smaller Displacement Instead of More Power"]

[Text] Graz, 2 Aug 91, VDI N—Otto engines have a potential for reducing fuel consumption by up to 25 percent as compared with the best existing developments," declared Karl Wojik. Last week at the Motor and Environment symposium in Graz, the automobile engineer from AVL List GmbH criticized the fact that only a very small proportion of today's vehicle fleets is equipped with the most up-to-date motor technology.

In Germany, for example, only three percent of the passenger vehicles now manufactured operate with multivalve engines: "Simply by means of consumer-oriented use of the four-valve technology in renewing the fleet, it would be possible distinctly to lower average consumption," according to Wojik. Additional cuts in consumption can be achieved by increasing combustion speed with fully variable control in the gas exchange, he says. AVL— according to its own information the world's largest independent

research and development center for engines—has developed the CBR method (Controlled Burn Rate) for this purpose and thus achieved consumption improvements in the test cycle of about 5 to 10 percent—"without therefore losing any operational capability," as the AVL engineer emphasized.

In Wojik's opinion, new technologies should not be used to increase performance but to reduce the swept volume. Advantages such as lower losses through friction and gas exchange should also be reflected in the fuel consumption. And even if the swept volume is altered, it would be recommended to "abandon the previous extreme short-stroke version and to construct oversquare engines," the Austrian engine developer concluded.

According to Wojik, "impressive" fuel consumption savings and emission reductions can be expected from creating an internal mixture, just as in a diesel motor. Since the tests with direct gasoline injection "repeatedly" showed "certain weaknesses," AVL is now working on a "very promising" concept of direct mixture injection (DMI). In this process a fuel-air mixture at temperatures between 150 and 400°C and a pressure of 10 to 40 bar is blown into the cylinder.

Altogether, the new technologies for the Otto engine, combined with measures involving vehicle technology, make it possible to anticipate fuel consumption of five liters of Euromix per 100 km, with average vehicle weights of 1,200 to 1,300 kilograms—"without any reduction in road safety and driving comfort," Wojik added.

Regarding the discussion about alternative fuel systems, the automobile engineer stated at the Graz symposium that a breakthrough could only be expected for renewable energies. For large-scale industrial use of solar energy one has to think in terms of 40 to 50 years, according to the present state of knowledge. Even then, the internal combustion engine could retain its attractiveness, after having proven as early as today how well it could be operated with hydrogen—which can also be obtained with solar energy.

Status of German Atmospheric Protection Research Reviewed

91MI0509X Bonn TECHNOLOGIE-NACHRICHTEN PROGRAMM-INFORMATIONEN in German 5 Aug 91 pp 1-12

[Interim appraisal by the BMFT [Federal Ministry of Research and Technology] of the implementation of the report by the Commission of Enquiry on Preventive Measures to Protect the Earth's Atmosphere]

[Text] **Introduction**

The BMFT, together with scientific circles, has reacted in good time and initiated appropriate research programs on the current global issues of:

- Destruction of the protective ozone layer in the stratosphere, and
- Possibility of climate change resulting from the increased anthopogenic greenhouse effect.

These steps have been taken in close collaboration with the German Bundestag Commission of Enquiry on Preventive Measures to Protect the Earth's Atmosphere, which submitted its third report "Protection of the Earth" on 5 October 1990 (Bundestag Paper 11/8030).

The three reports on "Protection of the Earth," which cover the destruction of the ozone layer, the greenhouse effect, and the destruction of tropical forests, together with a catalogue of measures, probably represent the most extensive status report on the current world situation. The first report concentrated primarily on ozone depletion, the greenhouse effect, and climate change, the second report on the role of the tropical rain forests, and the third focused more closely on measures, particularly in the field of energy.

The reports highlight the ways in which the views of the commission of enquiry and the action taken by the BMFT regarding climate research, ozone research, CO_2 emissions, and energy are being or have been coordinated, and what provisional conclusions can be drawn.

I. Greenhouse Effect and Climate Change

A. Need for Climate Research Emerging From the Commission of Enquiry's Report

Additional need for research is identified in the following areas:

1. Distribution and Trends of Directly and Indirectly Climate-Relevant Trace Elements and Climatic Parameters

- Evaluation of long-term climate data and paleoclimatalogical data
- Measurement of the global distribution and chronological modification of climate-relevant trace elements in the troposphere and stratosphere by means of satellites, airplanes and clean-air units;
- Recording of climate-relevant parameters (distribution of vegetation, ground temperature, and humidity);
- Role of aerosols.

2. Emission and Precipitation of Climate-Relevant Trace Elements

- Evaluation of cycles of trace elements of natural (C) and anthopogenic (CH_4, N_2O) origin;
- Climatic compatibility of automobile exhaust gases from catalyzers;
- Role of CFC [chlorofluorocarbon] substitutes in ecosystems;
- Effects of air transport;
- Reactions in the atmosphere, particularly heterogeneous chemical reactions, leading to alterations in chemism in the atmosphere;

- Information on the major trace gas emissions;
- Interaction between global troposphere chemistry and the biosphere in regard to trace element balance;
- Measurement of natural and anthropogenic emissions and distribution of trace elements, and their evaluation on a regional and nonregional basis;
- Investigation of trace gases that influence the chemistry of the troposphere and, consequently, the flow of halogenated hydrocarbon into the atmosphere among other factors.

3. Climate Modeling

- Development of three-dimensionally coupled climatic models, including chemistry and the carbon cycle;
- Improved parametering of radiation processes and clouds;
- Validation of results of models using global data, comparisons of models, tests of model quality;
- Model computation for differing trace gas scenarios;
- Improvement of regional definition.

4. Research Into the Effects of Climate

In addition to the effects of the climate on natural ecosystems, the need for research revealed in the commission of enquiry's report also covers the socioeconomic effects of climate changes at national and international level.

The following are examples of areas requiring future research:

- Natural ecosystems (ground erosion, water quality, water regime in rivers);
- Source and sink rates for major climate-relevant trace elements;
- Emission reduction measures;
- Displacement of vegetation zones;
- Agriculture and forestry;
- Effects of increased CO_2 concentrations;
- Chemistry of the troposphere, changes undergone by the troposphere;
- Economic and sociopolitical questions;
- International economic and political relations.

B. Present and Future Work by the BMFT

So far, 78 projects (including some major joint projects) have been funded or are currently receiving funding in the more specific area of climate research.

The BMFT's expenditure on climate research has risen from 6 million German marks [DM] in 1982 to DM53 million in 1990, including both project funding and the work undertaken in this area by the major research institutes. This amounts to some DM300 million for the whole year, including some DM55 million for the DKRZ (German Climate Computing Center) alone—far more than the other European countries spend on climate research. In parallel, atmospheric research has also been stepped up, with the result that more than DM100 million were available in 1990 for climate and atmospheric research funding.

The need revealed by the commission of enquiry for additional research on the greenhouse affect, is widely known and has already been partially addressed by the structuring of the BMFT's "Greenhouse Effect" funding program (initiated in 1989). More specifically, it covers:

1. Distribution and Trends of Directly and Indirectly Climate-Relevant Trace Elements and Climatic Parameters

Terrestrial and marine paleoclimatology already has a certain "tradition" (total expenditure to date approximately DM17 million) and is being pursued as part of the greenhouse effect funding program (about DM15 million 1991 - 1993). Research on the distribution and trends of climate-relevant trace elements (gases and aerosols) falls within the greenhouse effect program. A scientifically coordinated joint project is currently being drawn up.

The recording and distribution of climate-relevant parameters showing the interaction between temperature, ground humidity, and vegetation are carried out in exemplary fashion in the field campaigns that form part of the joint Land Surface Climatology project (expenditure around DM8.3 million to 1991). These studies will be stepped up in the future as part of the IGBP (International Geosphere Biosphere Program) core project BAHC (Biospheric Aspects of the Hydrological Cycle); the content of the project is currently being defined.

2. Emission and Precipitation of Climate-Relevant Trace Elements

As with trace element distribution and trends, trace element cycles will be studied as part of the future joint project referred to under 1 above.

Attention is drawn in this connection to the EUROTRAC [European Experiment on Transport and Transformation of Trace Elements] program initiated in 1985 as a EUREKA [European Research Coordination Agency] project, on which Germany has spent DM50 million for 52 projects. Its first objective is to study the chemical processes whereby air pollutants, including climate-relevant trace elements, are converted and transported.

In addition, the joint research project entitled "scientific support program for purifying the atmosphere above the new laender" (SANA), which has so far received some DM10 million in funding, is equipped to record and track significant environmental changes following on changes in emission levels. The aim of this project is:

- To bridge the existing gaps in knowledge concerning the transport, conversion, and effects of pollutants;
- To assess measures taken to reduce emissions;
- To develop dynamic chemical models (including heterogeneous chemistry) to determine cross-frontier

transport, emmission, and precipitation of, primarily, emitted and, on a second level, created pollutants;
- To utilize the results achieved in close collaboration with other joint projects to assess effects on the environment (natural ecosystems, living conditions etc.);
- To devise efficient emission reduction strategies.

The BMFT will address the remaining topics (automobile exhausts, CFC's, aviation) during its discussions with the Federal Government's Scientific Climate Advisory Council, and incorporate them into its programs and priority areas where appropriate.

3. Climate Modeling

All the subsidiary topics mentioned by the commission of enquiry are being addressed in larger joint projects ("climate modeling and climate diagnosis," "radiation and clouds," "scenario computation," overall funding for which amounts to some DM12.3 million from 1990 through 1992.

A major facility in this connection is the German Climate Computing Center" (DKRZ) in Hamburg, founded in 1988 as a supra-regional service providing computing time and technical support for simulations with sophisticated numeric models for scenario computation and climate forecasts. The BMFT bears the investment costs and part of the running costs arising from the BMFT-funded climate research projects.

Internationally, the DKRZ is one of the largest computing centers devoted solely to climate research.

There is a certain shortfall in capacity for validating results achieved with models, as specialized teams are presently in the process of formation and are thus not yet able to accept applications, while existing good teams are overwhelmed with work.

Research groups from the former GDR (Heinrich Hertz Institute of the Academy of Sciences, Humboldt University in Berlin, and the Meteorological Service) have climate diagnosis expertise and skills that will be utilized in the future.

The commission of enquiry's report mentions no causes of climate change that have not been or are not currently topics of BMFT funded research.

4. New Funding Program: "Research Into the Effects of Climate"

Changes to the earth on a global scale that may result from causes including climate change are a matter of public interest and concern. The public expects politicians to adopt appropriate measures making for successful adaptation to unavoidable climate changes. In addition to research into the causes of climate change and the interaction between various scientific phenomena, the effects on the economy and society must be investigated. The BMFT intends its funding program on "effects of climate change on ecological and sociocultural systems" to represent an identifiable German contribution to international global change research.

In accordance with the commission of enquiry's recommendations, the following areas are therefore being addressed:

- Effects of climate change on water supplies;
- Direct effects of anthropogenic trace elements;
- Effects of climate changes in the past;
- Effects of climate in natural ecosystems;
- Effects of climate change on the economy and society.

Every effort will be made to bring the projects into line with the aims of the IPCC (Intergovernmental Panel on Climate Change). Bringing national projects together on a global scale will be simplified by using compatible analysis methods and data formats. Appropriate guidelines are presently being devised by IPCC working party II on "impacts assessment."

At the start of October 1990, the BMFT held a workshop bringing together about 50 scientists to define a funding program on "research into the effects of climate." The topics thus identified coincide with the research requirements listed by the commission of enquiry.

A funding concept is currently scheduled for presentation by the end of 1991, although research is already under way in the following areas:

- Climate change and north German coasts (including coastal areas);
- Climate change and agriculture.

II. Ozone Depletion in the Stratosphere

A. Need for Ozone Research Emerging From Commission of Enquiry's Report

1. Coordinated, systematic work on aspects of the present BMFT ozone research program, particularly in cooperation with international scientists, appears sufficient in the short term to reveal the extent and the causes of ozone changes resulting from CFC's and other ozone-damaging substances.

2. The following remain unexplained and largely unresearched:

- Changes in UVB [Ultraviolet Band] intensity near ground level and effects that they produce;
- Influence on the stratosphere of present and future air traffic in terms of the increase in trace elements that produce chemical and climatic effects (H_2O, CH_4, N_2O, NO_x, particles).

The commission of enquiry therefore considers it a matter of great urgency that the current ozone research program be rapidly expanded to include the following research work:

(a) Changes in UVB Intensity and Effects on Atmospheric Chemistry:

- Development and installation of high-resolution UVB spectrometers with long-term stability at appropriate locations in the Federal Republic of Germany (North Sea islands, Hohenpeissenberg, Zugspitze), Spitsbergen (Ny Aalesund), and in tropical latitudes. These stations will be integrated into the international network and calibrated against one another at regular intervals. They will also possess measuring equipment to determine the vertical ozone profile, aerosol content, and degree of cloud coverage.
- Studies of modified UVB intensity and changes in the distribution of the trace elements O_3, SO_2, CO, CH_4, aerosols etc. in the chemistry of the troposphere.

(b) Effects of UVB Rays on Human Beings and Terrestrial and Aquatic Ecosystems:

- Link between increased UVB radiation and skin cancer;
- Effects on the immune system;
- UVB-sensitivity of natural ecosystems and commodity plants at various geographical latitudes;
- Adaptation mechanisms in plants;
- Relationship between increased UVB radiation and other environmental factors;
- Depth of UVB radiation penetration into the net primary production of phytoplankton;
- Direct/indirect effects on other links in the marine food chain.

(c) Regional and Global Modifications in the Chemical Composition of the Stratosphere (above 10 km) and Upper Troposphere (approximately 8 - 10 km.):

- Quantification of the relevance of emissions (H_2O, NO_x, etc.) from aircraft for the ozone and water vapor contents of the stratosphere and the upper troposphere;
- Atmosphere cycles and possible trends of propellant gases from stratospheric sulfuric acid aerosols;
- Transport of substances between the troposphere and lower stratosphere;
- Effect on the climate.

This requires:

- Availability at short notice of long-range aircraft with sufficient ceiling (stratospheric aircraft capable of flying at 20 km altitude); this latter requires technological development work;
- Increased work on the heterogeneous chemical conversion of ice and nitric acid hydrate crystals and (H_2SO_4 aerosols).

B. Present and Future Work by the BMFT

The BMFT, in close collaboration with the commission of enquiry, has already initiated part of the requisite research work:

1. Ozone Research Program

Launch of the ozone research program at the end of 1988; the program, scheduled to run for a minimum of five years, is intended to:

- Establish the nature and extent of changes in the ozone concentration;
- Identify the causes of these changes;
- Form a basis for reliable forecasts for future developments.

Field surveys and laboratory experiments are being carried out and mathematic models developed for this purpose. The ozone research program is concentrating on the northern hemisphere, with special reference to the north pole area. The desired cooperation with the European ozone research program has got off to a satisfactory start.

Around 26 projects involving total expenditure of some DM25 million, plus approximately DM8 million for TRANSALL operating costs, have been approved. A two-day briefing seminar on the status of current projects in the ozone research program took place on 13/14 June 1991.

Another 21 projects (costing some DM15 million) have been proposed (13 of which have so far been assessed positively) and are expected to be approved. A large proportion of the projects relate to the major European Arctic Stratosphere Ozone Experiment (EASOE) planned for winter 1991/92.

The TRANSALL project accounts for a major share with, at present, three remote sensing and two direct sampling experiments (the sensors cost about DM7 million, and the TRANSALL operating costs will amount to around DM8 million over five years). The sensors have already been successfully operated on the TRANSALL in field conditions in polar regions in January/February and again in April 1991, so they will be available for operation under the EASOE project.

Until then, TRANSALL will be able to operate from Norway, Sweden, and Greenland. Applications are currently being made for landing permission in Arctic territories (Iceland, Canada, and the Soviet Union), so as to ensure optimum meteorological conditions (position/motion of the polar vortex) for the surveys.

2. European Arctic Stratosphere Ozone Experiment (EASOE) Pollutants Arising From Aviation

The BMFT is currently considering the nature and extent of financial support for the national research and technology program on "pollutants arising from aviation" proposed by the DLR [German Aerospace Research Institute]. The purpose of the joint project planned by science and industry, and which will cost about DM200 million (with science's share amounting to about DM20 million) over 10 years is to:

- Study the climatic and atmospheric effects of pollutants from aircraft engines, and

- Achieve a drastic reduction in pollutants by developing new combustion chamber designs and propulsion concepts.

3. Ecological Research Aircraft

A survey among ecological research aircraft users is investigating whether additional aircraft capacity is needed; a need is currently emerging in stratospheric research (ozone research program, aviation) for long-range aircraft with large payload capacity and for a high-altitude stratospheric aircraft (Strato 2c); the findings of the survey will be presented in July 1991.

4. New Support Priority "UVB Measurement"

A workshop was held at the BMFT in February 1991 to define modelers and researchers' requirements for UVB measuring equipment. Matters relating to the installation of a measuring network were also addressed.

R&D projects on UVB measurement or development of measuring methods have hitherto been regarded as part of the UVB effect program. Now that a link has been revealed between an increased UVB dose and a measured reduction in the ozone layer, this area will now be integrated into the ozone research program. In view of the urgency of the task, consideration is being given, pending development of sufficiently accurate measuring apparatus, to installing "interim apparatus" at a limited number of measuring stations.

The draft program is scheduled for completion by the end of this year and will be approved by the Federal Government's Scientific Advisory Panel on the Climate. Funding is expected to commence in 1992.

5. New Funding Program: "Effects of Increased UVB Radiation"

Since 1978, the BMFT has carried out 25 projects funded with DM11.3 million on "biological consequences of increased UVB radiation." Research carried out under these funding measures has focused mainly on how increased UVB radiation affects aquatic plants, microorganisms, and terrestrial plants.

The BMFT is drawing up an interdisciplinary research funding program to investigate the effect of UVB radiation on entire ecosystems.

This program will complement the ozone research program, which concentrates on the results of UVB ground pollution measurement and understanding the causes and trends of this pollution. It will thus provide essential input data for laboratory and field studies. The effects of increased UVB radiation and their mechanisms will be studied in the following contexts:

- Chemistry of the troposphere;
- Aquatic ecosystems;
- Terrestrial ecosystems;
- Human health.

Funding for the applicants, presently totaling eight, will begin in the second half of 1991 and amount to approximately DM5.5 million.

III ATMOS (Atmospheric and Environmental Research Satellite)

A. ATMOS Recommendations Made by the Commission of Enquiry

The Federal Government was requested to introduce all necessary measures to bridge the gap in satellite data expected to arise from 1994 in atmosphere and environmental research and to this end to press for a European satellite or, should this not be feasible in time, comparable national satellite.

B. ATMOS Status of the BMFT's Work Under the ATMOS Program

The ATMOS Concept

Preparations for the ATMOS program, which, in addition to the space sector also includes the earth sector, the creation of an ATMOS data utilization center, a user secretariat, and data utilization, has been successfully completed. The purpose of the 10-year German-led international program is to provide and utilize global data records from ATMOS-type satellite to investigate current global change issues.

The strengths of the ATMOS as now defined are that:

- Three instruments operating in different wavelength ranges (UV-IR) and using various sensor technologies will make it possible to perform simultaneous, high-resolution measurements on a large number of entire trace-gas families from the same volume of air;
- The earth's surface will be observed (trace gas sources, biomass production) and tropospheric trace gases will be measured simultaneously.

In addition to bridging the data gap between the UARS (Upper Atmospheric Research Satellite) and the ESA POEM (Polar Orbiting Environment Mission)-1, it will primarily achieve added scientific value.

New insights into the interaction between biosphere and atmosphere and the chemical and dynamic link between the planetary boundary layer, the troposphere, and the stratosphere are expected. Furthermore, understanding of the chemistry of trace gases that lead to a reduction in the stratospheric ozone layer will be considerably improved.

The international scientific community underlined the importance of ATMOS at an ATMOS workshop held on 21 and 22 January 1991.

2. ATMOS Development Status

The B1 Study phase was concluded at the end of January this year. The outcome was that the ATMOS program

was considered feasible and that the mission could meet the scientists' requirements.

So as to further the concept of the ATMOS program through international cooperation, the BMFT has decided to initiate further feasibility studies as part of a B2 phase to be undertaken by DARA [German Space Agency] (DM12 million allocated for the 1991 budgetary year, scheduled term: to the end of 1991).

IV Research Into Reduction of Halogenated Hydrocarbon Emissions

A. Need for Research Into Halogenated Hydrocarbon Emrging From the Commission of Enquiry's Report

The measures proposed by the commission of enquiry are largely limited to political measures for reducing halogenated hydrocarbon emissions; the need for R&D on replacing these substances is implicit. Shortfalls in research are not specified.

B. Present and Future Work by the BMFT

The BMFT funding program on "reduction of halogenated hydrocarbon emissions" was announced in May 1989.

Under this program, the BMFT is supporting R&D on "cleaning processes," "plastic foaming," and "refrigeration air conditions," with a total of 33 projects costing DM25 million. Apart from the refrigeration, where chlorine-free compounds only are considered, halogen-free substitutes are being investigated and introduced. These are mainly water-based media and aromatic-free heavy petroleum spirits for cleaning, and air, nitrogen, and CO_2 in the foaming of plastics. As of now, the major R&D areas are covered by funded projects; other funding measures should be limited to outstanding "niche" problems or unconventional solutions.

The major emission areas and areas of application to date are included in these R&D projects.

V. "Energy and Climate" Area

A. Need for Energy Research Emrging From the Commission of Enquiry's Report

Often only indirect research recommendations can be derived from the measures proposed by the commission of enquiry, which did not specify, either explicitly or implicitly, shortfalls in research.

1. Renewable Energies

- Alongside the opening up of markets for launch-ready renewable energies, work on renewable energies requiring considerable additional R&D is to be stepped up.
- Wind plants require about 10 years' more R&D work.
- Photovoltaics (PV) and solar-hydrogen (H_2): owing to the long lead time several decades, market development and R&D must proceed in parallel.

2. Photovoltaics

- Increased energy effectiveness, to be achieved particularly by raising levels of efficiency and increasing use of combined power-heating plants.
- Measures for reducing methane emissions in hard coal and crude oil extraction, and the transport and distribution of national gas.

3. Nuclear Energy (vote by group that considered the use of nuclear energy to be responsible)

- Improving safety by developing safe light-water reactors and, as a possible alternative, high-temperature reactors.

4. Heating

- Funding program for further training of, primarily, architects, planners, engineers, building and heating technicians, and building workers in optimizing buildings from the energy point of view;
- Funding for active and passive solar energy exploitation.

5. Transport Sector

- Optimizing means of transport (in manufacture and operation) from the energy point of view and the technical measures for reducing emissions.

6. Industry and Minor Consumption

- Manufacture and use of products and application of processes suited to reuse or recycling.

7. Conversion Sector

- Improvement of levels of efficiency of power stations and combined heating and power stations.

B. Present and Future Work by the BMFT in the Major Areas

1. Renewable Energies

Wind: large-scale 100MW/200MW demonstration projects, new production techniques designed to reduce costs, and further development of key compounds.

Solar hydrogen: Improvement of electrolytic processes, photochemical H_2O production, H_2 fuel cells, application of H_2 for energy purposes.

PV: reduction of PV cell production costs, improvement of efficiency levels, thin-film technology, improvement of PV systems and applications technology. PV demonstration plants, 2,250-roof program.

2. Fossil Energy Sources

- Basic research on combustion (e.g., Tecflam, Turboflam);
- Development of environmentally friendly and economically viable power station technologies, e.g., gas and steam (pressure gasification of coal), pressurized fluid bed technology, and pressure gasification of coal dust);
- Launch of future CO_2-conscious lines of development with 50-percent efficiency levels (pressure combustion of coal dust and dual vapor process using a potassium turbine).

3. Nuclear Energy

- Reactor safety research as a preventive measure to ensure highest possible degree of safety;
- Decommissioning of nuclear facilities;
- Safety-related work for nuclear fuel cycle systems;
- Disposal;
- Advanced reactor systems.

4. Domestic and Minor Consumption

- Development of transparent heat insulation to commercial levels;
- Controlled ventilation in house building;
- Recycling heat techniques using new materials;
- Active and passive solar energy exploitation;

5. Rational Energy Consumption in Industry

- Advanced technical approaches to heat pumps and transformers;
- Ceramic heat exchangers for high temperatures;
- Oil/gas ceramic engines and stirling engine technology;
- Energy-saving sintering and deformation processes.

8. Transport

- Reduction of energy consumption, e.g., through new designs;
- Replacement of mineral oil products, e.g., with hydrogen, methanol, ethanol, or replantable vegetable oils (rape-seed);
- Improvements to the traffic flow (PROMETHEUS [Program for a European Traffic System With Highest Efficiency and Unprecedented Safety]);
- Energy-saving drive systems with brake recovery;
- Optimized drive systems for short-range vehicles and rapid rail systems.

No research policy gaps or shortfalls were identified in the commission of enquiry's report. The BMFT's president and planned R&D work goes as far beyond the research area stated by the EC.

Since power generation is currently responsible for about 50 percent of the anthropogenic share of the greenhouse effect, direct or indirect climate gas reductions may be expected from all the areas of energy research mentioned below. This applies to both CO_2-free power generation (renewable and nuclear energy) and the rational consumption of energy from upgraded coal-fired power stations, rational energy consumption in transport. It is not possible to give a more detailed attribution to specify reductions in climate gas.

Renewable energy sources and rational energy consumption are receiving funding under energy research programs in the form of project financing and contributions from major research institutes amounting to about DM350 million in 1991.

In addition to R&D work, the BMFT is comprehensively pursuing the commision of enquiry's with its project on "tools for developing strategies to reduce energy-related climate gas emissions in Germany." The aim of the project on tools that interested users can use to simulate "strategies" for reducing emissions of selected climate-relevant substances. The substances concerned will probably be the gases CO_2 and CO, water vapor, NO_x,CH_4 and other volatile hydrocarbons, CFC's, dusts, and aerosols. Drawing up particular strategies, to meet specific political prerequisites falls outside the projects's terms of reference, thus making it clear that the toolset is no substitute for energy policy. It is rather designed to assist in identifying technical options for a climate gas reduction strategy in boundary conditions, and to optimize those options, for instance by reference to a cost reduction approach. The major boundary conditions that must be taken into account include emission limits, price trends for raw materials and goods, capital availability and interest rates trends, the dynamics of innovation, and general economic trends for the initial year 1989 and the pivotal years 2005 and 2020.

The BMFT has also formulated a primary strategic approach to CO_2 reduction as a combination of tax exemptions, incentives, and sector-specific packages of measures (as recommended by the commission of enquiry), with financing from special funds targeted for specific CO_2 emission reduction measures, as follows:

1. Consistent expansion of nuclear power: 1 light-water reactor per year from 1997 as a substitute for brown and hard coal; approximately 7 percent;
2. Gas and steam stations, gas increasingly reduced for electricity generation: approximately 2.8 percent;
3. Combined heating and power stations, power-heat coupling, waste utilization, and renewable energies: approximately 2.1 percent;
4. Heat in buildings: approximately 8.3 percent;
5. Increased use of gas and exhaust heat exploitation in industry and minor consumption: approximately 2.1 percent;
6. Rational energy consumption in the industrial and domestic sectors: approximately 2.1 percent;
7. Transport: approximately 6.2 percent.

The total CO_2 reduction resulting from the Federal Government's guidelines amounts to 25 percent. The BMFT figures presented here are based on an interpretation of the papers submitted to date by the commission of enquiry and other studies.

Frankfurt Show Features 'All-Electric' Automobiles

92WS0003Y Paris AFP SCIENCES in French 12 Sep 91 pp 63,64

[Unattributed article: "The Electric Car: Fad or Solution of the Future?]

[Text] Frankfurt—Today, all the automobile manufacturers know how to build an electric car, and the 54th Frankfurt Automobile Show, which opened on 12 September, is overrun with prototypes in this domain.

Figuring prominently among the recent "all-electric" creations at the Frankfurt show—in addition to a small BMW, baptized the E-1—is Renault's latest, the Elektro-Clio, built jointly with Germany's Siemens firm. It is revolutionary in more than one respect, in that, today, it is powered by synchronous three-phase alternating current, and not by direct current as was its 1990 predecessor. Its motor has the power of a 1,000 cm^3 thermal battery, and enables the attainment of speeds of up to 120 km/hr.

According to Renault, "the Elektro-Clio has a range of 80 km in the city without refueling, enabling it to cover approximately 70 percent of daily travel requirements." But—and the drawback is one of scale—this range is attained only at a speed of 50 km/hr, and melts like snow under a hot sun as this speed is exceeded. Considering present-day driving habits, this range, even within city limits, is still insufficient.

Were this car to be commercialized, its sale price, today, would be approximately twice that of a thermal-powered Clio of equal power, assuming the use of simple lead storage batteries. Approximately 45,000 francs would have to be added for cadmium/nickel batteries. Furthermore, in both cases, these batteries would require charging times of around six hours.

A false problem, one might think, inasmuch as Nissan is expected to present new batteries at the Tokyo Show next month that can be charged in six short minutes. But what the Japanese manufacturer is not revealing for the moment is that the current required to recharge them must be supplied at a potential of 800 volts. This level of power could perhaps be installed in service stations, but for the time being the installation costs would be prohibitive.

Then there is the hybrid vehicle, equipped today with a diesel motor-generator set that produces its own electricity, and tomorrow with a turbine, undoubtedly a gas turbine, that will drive a high-speed electric power generator. During highway travel, this generator will charge a battery that can then be used alone for city-driving. Volkswagen with its Chico, and Peugeot with its 405, are presenting prototypes at Frankfurt.

The Peugeot 405 has, as of now, a top speed of 121 km/hr and a highway cruising radius of 750 km, starting with a full tank of diesel fuel. But in town, this range is sharply curtailed, inasmuch as this vehicle is heavier than a small all-electric vehicle. Moreover, no one, or hardly anyone, will operate it in the "all-electric" mode, unless some cities go so far as to bar their municipal centers to thermal-powered cars—not a likely step in the immediate future.

Despite all these handicaps, the all-electric vehicle seems sentenced to bear the brunt of a fad solution to tomorrow's problems. The state of California has already decided that "zero-pollution vehicles" must represent, for every manufacturer by 1995, 2 percent of their total registrations in that state. This percentage is expected to rise to around 10 percent within 20 years. And several other American states appear to be preparing to enact similar restrictions.

Ruhr Pilot Project Aims at Reclamation of Polluted Land

92WS0026X Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 12 Sep 91 p 8

[Article by "re.": "Successful Attempt at Encapsulation of Groundwater Using Glass Retaining Wall; Pilot Project Awakens Hopes for New Prospects of Sanitizing Abandoned Pollution Sites— DM220 To DM300 Per Installed Square Meter"]

[Text] Soil and groundwater in the Federal Republic of Germany are being endangered by abandoned polluted areas and waste sites. Hopes that it may be possible within the foreseeable future to literally dam up these polluted areas have been raised by the successful completion in early 1991 of a pilot project in the Ruhr. Using the first retaining wall ever to be made of glass structural parts, a drinking water procurement area was successfully sealed off from its surroundings. It may be that, in the future, underground glass structures will be used to encapsulate many possible centers of pollution quickly, economically, and with a dependable degree of impermeability.

More than 48,000 areas of suspected abandoned pollution were recorded in the Federal Republic of Germany during 1988. Experts predict that the number of cases will increase to approximately 70,000 in the old German laender alone. Against this background, the encapsulation of polluted areas as an effective means of blocking possible contamination routes takes on particular importance.

One essential technical element of comprehensive encapsulation measures is a system of vertical retaining walls, which must have the following qualities:

- It must attain a high degree of impermeability against aqueous and gaseous media.
- It must be durably resistant against aggressive media.
- Its impermeability must be verifiable.

According to the Technical Academy, waste dump foundation sealing systems designed for refuse must currently achieve a permeability coefficient of $K < 5 \times 10^{-10}$ meters per second (m/s). Logically, the encapsulation of abandoned polluted areas should be subject to corresponding requirements. The current state of the art in vertical encapsulation is a mineral retaining wall composed of synthetic retaining elements or steel sheet pilings, multi-layered where necessary. The use of a glass retaining wall to successfully encapsulate a reservoir of untreated water in February 1991 proved that glass structural parts are suitable, in principle, for use as subterranean retaining walls.

The impetus for this unprecedented project was provided by problems at a water procurement area in the Ruhr. To enrich the groundwater, the area was being irrigated with treated drinking water, which was then reextracted. To put a halt to a regular loss of water from drainage, the operators wanted to construct a 450 mm-long retaining wall to completely block off the groundwater stream. A team from Sheet Glass Consult GmbH in Gelsenkirchen and Phillipp Holzmann AG was commissioned to solve the problem. The team proposed a startling concept, which had been worked out in the course of a research project: The customary steel sheet pilings would be replaced by U-beams made of alkali-lime glass.

During construction, a subterranean curtain up to 12 mm deep is excavated using a special clamshell bucket. During the excavation, the curtain is continually filled with a slowly hardening bentonite suspension. A steel guidance frame is then installed over the trench. Hanging from a boom, the glass elements are placed over this frame closely together in the subterranean curtain, so that the U-beams adjacent to the guide rails interlock. Guided by the frame, the glass plates slide on the already standing subterranean wall. This procedure is suitable for nearly any subsoil. The suspension stabilizes the subterranean curtain during excavation, cushions unwanted movement by the components as they are installed, and supports the glass plates once they are in place.

Using high-pressure pinpoint injection of water, the hardened suspension can be re-liquified. This is useful when the first shift of the day must connect the first element to the last element installed the previous day. A rinsing box ensures selective liquification of the bentonite.

The reliquification of the bentonite suspension is even more important when the glass beam adjacent to the locking seam is to be rinsed free. The locking seam, which is fixed precisely in place with high-density polyethylene sliding locks, is crucial to the contamination barrier. Consequently, after the suspension has been flushed, the seam is sealed with a metallo-organic silicate gel impermeable to most known contaminants. In this combination, the glass retaining wall has a system permeability of $K_{fs} = 1.3 \times 10^{-13}$ m/s. Theoretically, this means that it would take a contaminant approximately 35,000 years to penetrate the barrier.

As a protective measure, there are wires running lengthwise through the glass elements. These are critical to important monitoring procedures carried out while the waste dump is in use. Because glass is an electrical nonconductor, the wires have a constant electrical resistance as long as they are completely isolated. Should one of the glass elements break, however, there would be an immediate, clearly measurable, change in resistance. The optimum solution would be continual monitoring, whereby the wires would be permanently connected to automatic measurement systems. This method was not implemented in the Ruhr project, as it was not dangerous contaminants, but water, that was being dammed up.

Only two of approximately 900 glass U-beams broke during installation. The construction company workers were particularly impressed by this. Transportation problems were successfully solved before the end of construction via special packaging measures.

Incidentally, construction took place during extreme winter weather conditions. The sole problem: When rainwater froze, it broke off some elements that had just been installed immediately above the surface. This had no effect on the impermeability of the system, and was subsequently prevented by the application of a foil covering at night.

In the opinion of the initiators of the project, its successful completion represented an important step in proving the fundamental practicality of the concept. Now they are hoping to tackle a genuine abandoned pollution and waste encapsulation project. After all, at a cost of 220 to 300 German marks per installed square meter, it is not only the functionality and ecological compatibility of the glass retaining wall that is appealing, but its affordability as well.

Technical variations of the procedure, such as double- or multi-layer retaining walls, are possible, particularly where the reclamation of waste dumps is concerned. The gaps in such systems could be impinged by filling them with a gel which has an internal overpressure and is capable of swelling. This would prevent the escape of contaminants even in the case of an underground rupture in the retaining wall.

Dieter Kallinich, certified engineer and manager of Sheet Glass Consult, is of the opinion that, with some technical modifications, the procedure can theoretically be implemented to depths of up to 40 mm. However, the next important innovation will be a modification of the

system's structural components. There are plans to increase the size of the retaining elements from 1.25 mm to 2.50 mm in the near future in order to reduce the number of interfaces in the retaining wall by up to 80 percent. A revised curve structure is also expected to afford the panels greater stability during installation.

Berlin Receives Ecological Funding From EC

92WS0051X Brussels EUROPE in English 20 Sep 91 p 11

[Unattributed article: "(EU) State Aid: The Commission Approves Aid for Environment-Friendly Activities in Berlin"]

[Text] Brussels, 19/09/1991 (AGENCE EUROPE)—The Commission has approved a notified State aid programme in Berlin running until 1993, with, for 1991, a budget of 6.9 million German marks [DM], or 3.34 million European currency inits [ECU]. The Commission judges this programme to be in line with the Community environmental policy objectives, as well as its aim to promote SMEs [small and medium-sized enterprise].

The programme involves:—grants to cover environmental consultancy costs incurred by companies with an annual turnover of DM60 million (ECU29 million); - promotion of environment-friendly and innovative investments, with aid being given in the form of equity, subsidised loans and conditionally repayable grants to companies with an annual turnover of ECU24 million carrying out such investments; - grants and subsidised loans given to companies with maximum of 500 employees that implement pilot projects demonstrating ecologically acceptable production processes; equity, conditionally repayable grants and soft loans are granted to enterprises that restructure their production processes to comply with environmental norms; grants awarded to companies with an annual turnover of ECU24 million to help them market environmentally friendly products.

Closed-Cycle, Environment-Friendly Cellulose Production Method Studied

92WS0029X Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT in German 30 Sep 91 p 8

[Article by Eberhard Zerres: "Closed-Cycle Process for Environmental-Friendly, Chlorine-Free Production of Cellulose; Production Using Organocell Process To Begin in Summer 1992; Reduction of Environmental Load Expected; Elimination of Sulfur"]

[Text] To meet the requirements for high-grade paper, it is necessary in varying degrees to continuously furnish new fibers. These fibers are produced mechanically as wood pulp, or chemically as cellulose pulp. The yield from mechanical digestion is very high; however, the process requires a relatively large amount of energy. Hydrogen peroxide, which is environment-friendly, is generally used to bleach the wood pulp; chlorine and chlorine compounds are not used.

The chemical digestion of cellulose from wood requires the use of chemicals to separate the cellulose fibers from the structure of the wood. These chemicals are then recovered and reused in the production process. Although the cellulose yield is only 50 percent, the process is generally self-sufficient where energy is concerned: Combustion of the nonusable woody fibers generated by the pulping process produces enough energy to run the cellulose plant.

The primary source of environmental loads during cellulose production is the cellulose bleaching processes, which follows digestion. During bleaching, the residual lignins are separated from the cellulose fiber mixture. This process is essential whenever those grades of white paper and carton are called for which will not discolor during storage, will not yellow in sunlight, and combine whiteness with durability. Of course, the paper itself is not bleached.

During the past several years, ecologists have demanded that the cellulose industry avoid bleaching methods that use elemental chlorine or, wherever possible, other chlorine compounds. Consequently, research into alternatives to chlorine bleaching is being conducted throughout the world. New wood digestion methods are being developed that yield a cellulose that can be bleached without using elemental chlorine or other chlorine components.

One of these new methods, the Organocell Process, is a development of the Organocell Association for Cellulose and Environmental Technology, mbH, Munich, a subsidiary of Technocell AG, Munich. The Organocell Process can be used to digest all types of wood, including pine as well as so-called annuals such as straw, bagasse, and kenaf.

The two primary methods used to produce cellulose are the sulfite process and the sulfate process. Sulfite cellulose, which is relatively light even in its unbleached state, can now be bleached using oxygen and oxygen compounds rather than the previously customary chlorine compounds. There are drawbacks to the sulfite cellulose process, however: The cellulose is of relatively low strength and only a limited number of wood types can be used. Most important, pine wood, of which Germany has a relatively untapped supply, cannot be used in this process.

Sulfate cellulose has important qualitative advantages over sulfite cellulose, above all with regard to strength. The drawback of this process is that in order to produce fully bleached sulfate cellulose of the high quality demanded by the market, it is still necessary to employ a combination of elemental chlorine and chlorine compounds in the bleaching process. In modern bleacheries, of which there are still very few, the use of elemental chlorine may be avoided completely; however, chlorine compounds must still be used as a bleach. Modern

bleaching methods based on oxygen or oxygen compounds are already adequate for the production of partially bleached, yellowish sulfate cellulose, the whiteness of which is considerably below the quality of fully bleached cellulose. Consequently, the sulfate cellulose is of limited use.

Cellulose plants using the sulfate process are prohibited in Germany, as even the smallest concentration of hydrogen sulphide, one of the by-products of the process, irritates the sense of smell, and it is difficult to dam up organic sulfuric hydrides. Furthermore, for safety reasons, sulfate cellulose plants in Germany are not permitted to use combustion furnaces to recover pulping chemicals.

In view of this problem, Organocell, after eleven years of research and development, has developed a process whereby cellulose can be produced, entirely without the use of sulfuric hydrides, from virtually all wood types as well as from the so-called annuals.

It has been known since around the turn of the century that alcohol and water at high temperatures can be used to obtain cellulose from deciduous trees. Organocell researchers built on this knowledge, refining it to the point where wood from coniferous trees can now also be considered a raw material. In the Organocell process, wood chips are saturated with an aqueous solution consisting of methanol and caustic soda, then digested in a pressure vessel for 60-90 minutes at approximately 170° Celsius. The resulting cellulose has a strength equal to that of sulfate cellulose and far exceeding that of acid-digested sulfite cellulose. This was successfully proved at Federal Ministry of Research & Technology (BMFT) demonstration facility.

A continually operating digester located in a Munich residential area produces up to five metric tons of cellulose daily, which is either used by Technocell to produce paper impregnated with synthetic resin or is sold elsewhere. Attached to the cellulose digesting plant is a bleachery, in which the Organocell cellulose is bleached in three stages. In 1987, when the plant began operation, the primary objective was the development of a sulfur-free digestion process, as the threat to the environment posed by sulfur was well-known. Bleaching was included in the process in order that the cellulose be as marketable as possible. Today, the process has been developed to the point where the sulfur-free cellulose digestion process is well in hand, and attention can be focused nearly exclusively on the optimization of the bleaching process.

Oxygen, hydrogen peroxide, and chlorine dioxide are used to bleach cellulose; however, research during the past 12 months has been focused on the elimination of the chlorine dioxide step and the optimization of peroxide bleaching. Some 10 years ago, a cellulose plant of 300 daily annual tons output (dato) in Washington state was shut down because the cellulose was not as white as the market at that time demanded. However, today's environmentally conscious consumer is satisfied with the degree of whiteness that can be attained by bleaching with oxygen and peroxide alone. This was clearly demonstrated in market studies by manufacturers of diapers and other sanitary products.

The Organocell process proved so environment-friendly so early that the Organocell GmbH took over the Bavarian Cellulose GmbH plant in Kehlheim from Waldhof-Aschaffenburg Paperworks (PWA). The original plan was to close the plant, as the environmental burdens resulting from the acid sulfite process employed there had become intolerable. Presently, a factory designed for the Organocell process is being built on the site of Bavarian Cellulose, at a cost of approximately 350 million German marks [DM].

Organocell Thyssen, a joint subsidiary of Organocell and Thyssen Trade Union or Thyssen Rheinstahl Technology, is responsible for the planning, construction, and opening of the plant. Organocell Thyssen, which was established in 1988, is responsible for international marketing for Organocell plants.

The digesting plant - construction was completed in 1991 - is to be equipped with a continual Kamyr digester (at a cost of DM110 million) which requires much less energy than a batch system of equal capacity. The chemical recovery is based on a long-standing and often-used technology used in alkaline cellulose production the world over. No detail of the construction of the new digesting plant was left to chance; the design was based on the existing industrial plant, and any questions that arose were clarified at the demonstration plant. Construction is currently underway on a new bleachery in which cellulose can be bleached in an environment-friendly manner entirely without chlorine or chlorine compounds.

The digester, an in-house development, is the heart of the new cellulose factory. When the new plant begins production in the summer of 1992, the environmental load caused by cellulose factories will decrease dramatically. Despite the fact that plant capacity will be increased from 65,000 to 150,000 dato, the total emissions will be less, and the emission of sulfur dioxide, currently estimated at 1,270 dato, will be eliminated completely, as the Organocell process operates entirely without sulfur.

The load on the Danube from wastewater resulting from the still ongoing cellulose production using the old process was drastically reduced by the construction of a sewage clarification plant, which began operation in May 1990. Once the new plant begins operations using the Organocell process, it will not only meet the pollution burden limits established by environmental authorities, but in some cases will actually beat them.

Kohl Voices Support for Rio-92 Environment Conference

PY3110211491 Rio de Janeiro JORNAL DO BRASIL in Portuguese 30 Oct 91 p 3

[Report on working breakfast hosted by German Chancellor Helmut Kohl for journalists Manoel Francisco do Nascimento Brito, Roberto Marinho, Luis Garcia, Zevi Ghivelder, and Ana Bentes on 29 October at the Copacabana Palace Hotel in Rio de Janeiro]

[Text] Extremely good-humored, dressed in a dark blue suit and with an elegant red tie, Kohl once again highlighted the reasons that led him to choose Latin America as the first region to visit as chancellor of unified Germany: the unquestionable certainty that Germany wants to call attention to the need to strive for resolving the North-South conflict and for preserving the environment.

He outlined the impressions he had when he visited the Amazonian region, which according to him is one of mankind's major assets. "I believe that the environment and human beings are inseparable, and that nothing can be done for the environment without taking man into account," he stressed, adding that the preservation of tropical forests is essential for preventing worldwide climate deterioration.

Conference of Rio de Janeiro—Kohl reiterated that he will try to convince the other chiefs of state of the Group of 7—whose presidency he will take over in March—to attend the conference to be held in Rio de Janeiro in June 1992. "Fifteen days later, we will hold a summit meeting in Munich, and it would be a disaster for the world if these meetings failed," Kohl said. He intends to personally strive for the success of the two meetings. He said the subject was comprehensively analyzed during meetings he held with President Collor and several governors, among them Amazonas Governor Gilberto Mestrinho, whom Kohl described as a "person with special characteristics." Kohl added that Mestrinho clearly understood that Germany's plans to lend $150 million for investment in tropical forest areas will involve no risk of internationalization of the Amazonian region. He said: "I am firmly determined to provide Governor Mestrinho with all the information that is available to us for the preparation of the Rio de Janeiro conference so that he does not think that we are concealing anything."

Now that he has realized his most cherished dream—the unification of Germany—Kohl is taking steps toward a new objective: European political and economic unity. He said that the timetable for the next six to eight years already has been established:

—In 1992, implementation of the large common market, with 340 million consumers

—In 1994, the holding of elections for the European Parliament, which will (?consolidate the region's legal structure)

—In 1995, Austria and Sweden will join, and they probably will be followed by Finland and Sweden [as published], and—later—by Switzerland ("after all, the Swiss are good at numbers")

—In 1997 or 1998, a central European bank will be created and a single currency will be adopted. ("I am talking about a true central bank, independent of governments, operating like our Bundesbank with the only objective of guaranteeing currency stability," Kohl said).

"A new Europe will rise," Kohl said, adding that "the 21st century will be substantially different from the 20th century. There will be no World War III. We will have a European Defense Force that will cooperate with NATO and Germany will participate in all that."

The Soviet Union—In this new geopolitical arena, the USSR's position is still sensitive because it still needs support. "If the USSR were dismantled now, it would be a negative step. I hope that the Soviet republics will manage to get organized into federations, thus guaranteeing continuation of the whole," Kohl said. In 1990, Germany invested more than $45 billion in credits for the Soviets, in addition to $20 billion that went to other East European countries. The German chancellor sent a message to a clearly identified audience: "I think it is high time for our U.S. and Japanese friends to cooperate."

Kohl voiced support for the principle of federalism, deploring the existence of what he called "the strait jackets" of history, which produce nationalistic outbreaks and explosions of 1,000-year- old conflicts, like in Yugoslavia.

Kohl is proud of the fact that his political wisdom led him to act at the right time for securing German reunification. "Politicians are men, and men are usually more vain than women," he said, adding that "unification was a dream that I always expected to come true." Despite the fact that many had resigned themselves to a divided Germany, Kohl said he never lost his conviction that it would be impossible to impose restrictions on people who struggle for their freedom and unity. "The process of unification developed like a river: One can build a dam across it or its waters can be diverted, yet they will end up finding their way into the ocean."

IRELAND

Report Finds Chernobyl Did Not Cause Increase in Dublin Area Birth Defects

92WN0075A Dublin IRISH INDEPENDENT in English 24 Sep 91 p 3

[Article by John Maddock]

[Text] The Chernobyl nuclear accident in the Soviet Union did not cause any increase in the number of

babies born with malformations in Dublin and adjoining counties during 1986 and 1987, according to a report published today.

The report, entitled: 'EUROCAT—Surveillance of Congenital Anomalies in the Eastern Health board region 1980-1987,' is published by the Dublin- based Health Research Board.

The Dublin congenital anomalies surveillance system is population-based and covers Dublin City and County, Co. Kildare and Co. Wicklow.

The births monitored—in Dublin city and country, and Co's Kildare and Wicklow—comprise around one-third of the total yearly births in the Republic.

At the time of the Chernobyl accident on 28 April, 1986, the Dublin system for monitoring congenital anomalies was in operation. The report says there was no increase in the number of babies born with one or more malformations in 1986 and 1987. Specific malformations did not increase either.

EUROCAT analyses of central nervous system anomalies in 18 other regions of Europe showed similar results. EUROCAT is an acronym for an EC programme for the surveillance of congenital anomalies.

Today's report says that between 1980 and 1987, 184,437 births were monitored in the EHB area. During that period, total births fell by 22pc.

On average, 3pc of all births resulted in a baby born with one anomaly or more.

ITALY

Glass Recycling Program Considered Success

92WN0055A Rome L'ESPRESSO in Italian 20 Oct 91 p 184

[Unattributed article:"Italy Made of Glass"]

[Text] We rank third in Europe in recycling.

In the collection of glass too, Italy is proceeding at two different speeds. Of the 732,000 tons of recycled glass in our country last year, only 8 percent came from the southern regions, while 71 percent was collected in the north and 20 percent in the center. These figures are indicative of the commitment to the environment by local authorities as well as underscoring the major differences in ecological behavior among the population. According to estimates drawn up by Assorecuperi, the region that comes out ahead in the collection of glass is Trentino-Alto Adige, with 19.38 kg per capita per year. Last place goes to Calabria, with 200 grams per head, where only four out of 409 municipalities are involved in the operation.

Despite these significant disparities, Italy nevertheless continues to advance in the standings of the most active European countries in the collection of bottles and glass containers. While 40 percent of the glass produced was recycled in 1988, the average for 1990 rose to 49 percent. And even if still lagging far behind in results such as those achieved by Holland, Switzerland, and Austria, where over 60 percent of glass production is recycled, Italy had made significant progress: This is demonstrated by securing third place, behind Germany and France, for the amount of recycled glass in absolute terms.

NORWAY

European Economic Space Agreement Seen as 'Environmental Agreement'

92WN0079A Oslo AFTENPOSTEN in Norwegian 23 Oct 91 p 4

[Article by Ole Mathismoen: "European Economic Space Agreement Is an Environmental Agreement"]

[Text] **The European Economic Space [EES] agreement means tightening Norwegian environmental regulations. The existing Norwegian regulatory structure will not be weakened. The EES agreement is the most comprehensive environmental agreement Norway has ever underwritten, according to State Secretary Jens Stoltenberg.**

Environmental Affairs State Secretary Stoltenberg is attemting right off to steal the thunder from environmental critics of the EES agreement. However, he does not expect any special environmental outcry against the agreement:

"Conflicts may arise between the principle of free trade and environmental considerations, but I believe that real environmental needs are protected in this agreement. It has a number of escape clauses which enables us to abstain from certain EC regulations. Additionally, the record of the EC court shows that serious environmental consideration is given precedence over the demand for a free flow of goods. This predisposition will form the basis for the work of the EES court," said Stoltenberg.

He pointed, among other things, to Article 6 of the EES agreement, which corresponds to Article 36 of the Rome Treaty. There it states that decisions concerning free trade shall not represent an obstruction to bans or restrictions on import, export, or transit which have been established for the protection of human, animal, or plant life and health. Two specific cases, the Danish return bottle deposit case and a decision which prohibited the sale of spill oil in France, demonstrate that the environment may be put ahead of free trade.

Stiffer Regulations

"The EES agreement means that the EC's environmental directives (laws) will have validity in Norway. Some of these will require that Norwegian regulations be strengthened. In certain cases, it will actually mean tightening environmental requirements, in other cases, it

will mean that the environmental requirements we have developed through the granting of concessions, for example, must now become formal regulations," said Stoltenberg, and mentioned some examples:

—Norway must introduce stricter standards for preparedness in the prevention of industrial accidents.

—Norway must introduce stricter standards concerning the content of sulfur dioxide, airborne particles, nitrogen dioxide, and lead in the air.

—Increased pressure to implement plans for reducing municipal sewage dumping and run-off water from food industry and fish processing plants.

—Stricter enforcement of regulations on drinking water quality.

—Stricter standards for residues of plant protection substances (sprays) in foods.

—Stricter noise-level requirements for a series of household appliances.

—Norway will get an extended exemption for some of the EC's weaker environmental stipulations, such as the ban on asbestos, arsenic, mercury batteries, and heavy restrictions on solvents.

—Norway will be able to retain its requirement for the phasing out of ozone-destroying CFC gases.

—Norway can retain its national legislation on chemicals until 1995. At that time there will be new discussions with joint regulations as the objective. Lacking a concensus, Norway may continue to apply its own standards.

—During a transition period, there may be problems with gas emission requirements for heavy vehicles. In the period from 1995 to 1996/97 we may accept imports of heavy vehicles with lower standards than we intend to introduce—with the expectation that the EC will according to plan institute the same regulations starting in 1996/97.

Minimum Requirement

Stoltenberg explains that for those EC environmental decisions which do not involve free trade, the decisions are so-called "minimum decisions."

"This means that every country can introduce stricter environmental requirements if they so choose. At the same time, Norway may now use its influence in an effort to tighten restrictions," he said.

But if we are not present when the decisions are made? "We ourselves can propose stricter requirements for the entire EES. We will be present during the exploratory phase of the EC's own environmental debates. But we will not be present when the decisions are taken in the EC. On the other hand, we can abstain from introducing the EC's new regulations, because within the EES there must be complete agreement. We could get into a situation where the EC adopts environmental restrictions while the EFTA countries use their veto in the EES to block the introduction of those restrictions in the entire EES and not merely in the EC."

Taxes and levies are not a factor in the EES. Therefore there is no obligatory cooperation on environmental levies. But because the environmental ministers in the EES must meet regularly, the potential for coordination is greater with an agreement than without one.

Former Prime Minister on Energy Alternatives

92WN0059A Oslo AFTENPOSTEN in Norwegian 12 Oct 91 p 2

[Guest commentary by former Prime Minister Kare Willoch: "Lose Environmental Protection Again?"]

[Text] Opinion is divided on whether man-made emissions of certain gases contribute to a catastrophal warming of the earth, that is, the 'greenhouse effect.' But Norway has adopted a stance and is actively urging the world to use the greenhouse theory as a basis for a more effective environmental policy.

Given this, it would be strange if, at the same time, we shrank from drawing the practical conclusions indicated by the theory.

As a contribution to a worldwide battle against emissions which are believed to affect the climate, the Storting has determined that Norway's own CO_2 emissions must be stabilized. Our national congressional body has determined this to be Norway's policy, and this can be pointed out should there be an attempt to brush aside this pledge when the bill is laid on the table.

Yet the rationale behind the call for provisions against the greenhouse effect suggests that even the stabilization of yearly emissions is not sufficient to stave off the damage that threatens. If the theory is accepted that increased amounts of CO_2 in the atmosphere contribute to harmful warming of the earth, the conclusion must be that the total quantity of gas must be reduced. In continuing with the same size yearly emissions as before, we are contributing to the further growth of total gas quantities.

It must also be accepted that poorer countries will continue to increase their annual emissions because they cannot battle their own poverty without this secondary effect. This means that if pronouncements about the greenhouse effect are to be taken seriously, the nations which have the capability must reduce the amount of their annual emissions as much as possible.

Norway has the potential, in its natural resources, for doing more than other western countries towards limiting its CO_2 emissions. All countries need to put more effort into energy conservation, but we can—by further

development of hydropower—create additional energy which does not, generally speaking, lead to harmful emissions.

Whether we use this energy in place of oil or gas, or whether we export it to others so that they can use less polluting fuel, the development of hydropower can be a contribution to the curbing of world emissions.

In opposing this, it is argued that Norwegian hydropower is, in any case, of so little significance for the world's energy supply that we ought to let the idea drop for this reason alone. But this is a viewpoint that can justify virtually every argument against a Norwegian contribution to environmental protection: Norway is too small to make a contribution which will in itself be of any benefit. But Norway is not too small to set an example which could be significant. We set an example when we try to exempt ourselves from the restrictions we ask others to impose upon themselves and when we refuse to accept even minor disturbances to our natural environment, even though such measures could cut down on the damage to the atmosphere. And, it has been demonstrated that it is possible to harness more Norwegian water power with less unavoidable disturbance to nature than was previously thought.

But instead of supporting the development of hydropower, powerful forces want to develop gas-fired power plants. If the responsible authorities accept this, it will show an impressive ability on our part for making ourselves believe that we can unify irreconcilable viewpoints: It will be asserted that others can reduce their emissions by buying our gas energy, as well as that others can reduce their energy consumption by producing less energy-consuming goods while we increase our production. Briefly: We wish to convince ourselves that we can reduce emissions by increasing them.

But it is not true that we have to develop gas energy in order to sell power or to step up production in energy-consuming industries: Pollution free hydropower can do the same thing in the long run. It is also not true that higher energy-consuming production in Norway means correspondingly lower energy-consuming production in other countries: One must take into account that greater investment in energy-consuming production also means measures to increase sales of these wares, and ultimately, increased energy consumption in the world.

One must not overlook the fact that more energy can be obtained out of each cubic meter of gas when the gas-fired power plant is built in places where the waste heat from the plant can be utilized. This means that the pollution per energy unit produced can be limited provided the plants are placed closer to consumers than is currently the case in Norway.

Time Perspective

Industry spokesmen want likewise to utilize natural gas in Norway. They will base their advice on industrial economic considerations. Let them do that. But policy-makers must take into account the fact that industrial economics has a shorter time perspective than is required by global environmental policy. Shorter time perspectives mean weighing today's economic advantages against future drawbacks. Calculations made on this basis handily show an industrial economic profitability linked to a hasty consumption of inherited resources. Special interest organizations have the same fixation on the near rather than the remote future. And in those districts where special advantages are anticipated from measures that would increase emissions, the concern for the world's atmosphere will easily be dismissed as "theoretical."

Against the alliance between big industry, the labor movement, and the district interests, the proponents of environmental protection have a difficult task. But, the task of preventing Norway from becoming an example of disparity between word and deed, is an important one.

UNITED KINGDOM

Plans for Antipollution Agency Shelved

92WN0051A London THE SUNDAY TELEGRAPH in English 22 Sep 91 p 4

[Article by David Wastell and Greg Neale: "Major's Pollution Agency Is Shelved"]

[Text] Plans for a new antipollution agency, announced by Mr. Major in July, have been shelved for at least a year because of fears that legislation would give the Opposition an electoral field day.

The decision, which will embarrass the government as it prepares to trumpet the anniversary of the environment White Paper this week, follows a Whitehall streamlining of Bills for the expected fifth session of the current Parliament, aimed at weeding out potentially difficult ones.

Government business managers have ruled out a Bill on the new agency, long sought by environmentalists, because they believe the subject provides too much scope for awkward amendments.

Mr. Michael Heseltine, the environment secretary, will on Wednesday publish the first annual "audit" of the government's environmental achievements. He is expected to claim great progress since publication of the White Paper.

A Department of the Environment guide is to be issued to other Whitehall departments tomorrow, urging them to take account of "green" factors in policy-making.

The new agency was intended to bring together Her Majesty's Inspectorate of Pollution and the antipollution work of the National Rivers Authority [NRA]. "The

integrity and indivisibility of the environment should now be reflected in a unified agency," Mr. Major said in July.

It would have responsibility for monitoring air and water quality, proposing new pollution standards, regulating emissions and discharges and controlling the handling and disposal of waste.

But it has become the subject of a Whitehall squabble in which Mr. John Gummer, agriculture minister, has been arguing to take over some of the NRA's responsibilities for land drainage, flood defence and inland fisheries. Environmentalists, including senior members of the NRA, have said that this would place responsibility for checking river pollution from farmland in the hands of a ministry that has been accused of being too deferential to farming interests.

A consultation paper on the new agency is to be issued next month but the delay in setting it up was condemned yesterday by environmental pressure groups, which accused the government of downgrading its commitment to tackle pollution.

Mr. Andrew Lees, campaign director for Friends of the Earth, said: "In his July speech, John Major made a big pitch for a world role as a leader in environmental matters and set himself up as a man who would deliver an environment agency—something groups such as ourselves have wanted for years. He has now shown himself unable to deliver."

Mr. Colin Hines, political director for Greenpeace, said: "To have allowed this delay shows how low down the environment is on the government's list of its priorities."

Mr. David Trippier, environment minister, said yesterday that the government would seek a "balanced view" of the new agency and what part of NRA's functions will play in it. "The worst thing possible would be to come forward with legislation which had not been properly constructed and where cognisance had not been taken of all the views of those involved," he said.

On Wednesday Mr. Heseltine will emphasise, as achievements of the last year, Britain's contribution to international initiatives, the introduction of integrated controls on domestic pollution, anti-litter measures in the Environmental Protection Act, and increased environmental awareness in Whitehall.

Ten Large Companies To Be Prosecuted for Pollution

92WN0074A London THE DAILY TELEGRAPH in English 3 Oct 91 p 7

[Article by Charles Clover, Environment Editor]

[Text] Ten large companies are to be prosecuted for allegedly causing pollution, HM Inspectorate of Pollution said yesterday.

This more than doubles the number of firms prosecuted by the inspectorate since it was formed four years ago.

Dr. David Slater, director and chief inspector, said at the publication of the inspectorate's annual report that it was not possible to name the companies for legal reasons but the prosecutions were "in the pipeline."

The move is likely to be seen as further evidence that the inspectorate is ending its close relationship with industry and taking a critical and public role under the leadership of Dr. Slater, who took over on 1 April.

The inspectorate has successfully prosecuted the Atomic Energy Authority at Harwell for radioactive releases caused by incinerating telephones and British Nuclear Fuels for radioactive releases at its Springfield plant. They were fined 2,000 and 7,500 respectively.

Dr. Slater said that in both cases the pollution caused was "very minor" but the inspectorate had been trying to get the firms' managements to recognise and plan for unexpected failures caused by "Murphy's law."

"We see our mission as to help fundamentally to protect the environment, not just to impose the rules," he said.

Staffing was being increased by nearly a third this year, from 232 to 313 by early next year. However, partly due to staff shortages, the number of company visits by inspectors had fallen again in 1990/91, to 3,867, from 7,887 the year before.

Dr. Slater, who was appointed after the departure of several senior staff from the inspectorate and a period of low morale, said he had told ministers that it was snow "in good heart and moving in the right direction."

He defended this year's annual report from the charge that it was not as hard-hitting as its predecessors.

He said it was not meant as a "list of bad actors" in industry. That role would be provided by the new public registers of pollution information affecting every company.

He said he would consider making these public registers—staff say a degree in chemistry is necessary to understand them—more accessible to the public.

Heseltine Outlines Proposals To Merge Pollution Control Bodies

92WN0073A London THE DAILY TELEGRAPH in English 4 Oct 91 p 7

[Article by Charles Clover, Environment Editor]

[Text] Proposals to merge pollution control bodies into a single powerful agency were published yesterday by Mr. Heseltine, Environment Secretary.

He said the Government has decided to publish four options so that any conflicts in the proposals could be ironed out during the public consultation which lasts until the end of January.

Environmentalists had expressed concern that the proposed merger of the National Rivers Authority [NRA] and Inspectorate of Pollution, announced by Mr. Major in July would have dismembered the NRA, one of the Government's most successful creations.

Angling organisations, environmentalists and landowners were worried by reports that the Government was shifting NRA responsibilities for flood defence, land drainage and fisheries to the Ministry of Agriculture.

They said this would place the responsibility for rivers in the hands of a ministry dominated by farming interests.

The options outlined are:

- Combining the functions of the pollution inspectorate and the waste regulation functions currently undertaken by local authorities within the new agency. The inspectorate's responsibility for water would be transferred to a separate NRA.
- Creating a "federal solution," with an umbrella body to oversee and co- ordinate all the work, but with the inspectorate and NRA retaining separate identities and management structures.
- Creating a fully-integrated agency covering the inspectorate, waste regulation and embracing all NRA functions.
- Combining only the NRA's pollution control responsibilities with the inspectorate and waste regulation within the new agency.

Mr. Heseltine said the fourth option would still mean the residual part of the NRA would answer first to the Agriculture Ministry instead of the Environment Department. Mr. Heseltine said: "We are absolutely determined that nothing is done to prejudice the high standards of environmental enhancement that the NRA represents."

"There are undoubtedly conflicting arguments and that is one of the reasons why we want this consultation."

He added that another option would be to combine all the agencies under his own department without the need for legislation. But this would not provide the "one-stop shop" for pollution control that industry wanted.

Mr. Andrew Purkis, director of the Council for the Protection of Rural England, said: "We are pleased the Government is not rushing into legislation and that they have introduced new options."

Environment Minister Announces Program To Purify Drinking Water

92WN0072A London THE DAILY TELEGRAPH in English 5 Oct 91 p 5

[Article by John Grigsby, Local Government Correspondent]

[Text] A 450 million programme by eight water companies to instal 79 new treatment plants by the end of 1995 to remove pesticides and other residues from drinking water was announced by Mr. David Trippier, Environment Minister, yesterday.

The eight companies supply 23 percent of England's water to 12 million people.

Proposals by another 15 to deal with pesticides will be announced before the end of the year. The remaining 16 companies are achieving the standard laid down by the European Commission.

Companies have told Mr. Trippier they can absorb the cost within permitted price increases.

Thames Water, which supplies water and sewerage services to more than seven million people, said the 27 new plants to be built before 1995 and the four after that date would cost 360 million, equivalent to 100 a house.

The programme is the first outcome of a review of water companies' compliance programmes which Mr. Trippier asked the Drinking Water Inspectorate to carry out earlier this year.

In excessive concentrations, pesticides can cause cancer and malformed babies. But Mr. Tripper said: "No pesticide detected is known to be harmful or likely to damage health in the minute concentrations found in supplies.

"We expect a report from the Advisory Committee on Pesticides next year on conditions of use for two herbicides most often detected in supplies- -atrazine and simazine—used to a large extent for non-agricultural purposes."