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# ***JPRS Report***

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# **Environmental Issues**

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# Environmental Issues

JPRS-TEN-91-017

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## U.S.-Soviet Project for Study of Ozone Layer

### Joint Research Goals

LD0108222691 Moscow TASS in English 1119 GMT  
1 Aug 91

[By TASS correspondent Vyacheslav Serikov]

[Text] Leningrad August 1 (TASS)—The ozone layer enveloping the Earth has been described as the planet's biological shield warding off the Sun's harsh ultra-violet radiation. Research already done by Soviet and U.S. scientists formed the basis for the work of Soviet and American researchers—members of the Earth Science Working Group who plan joint experiments and exchange of observation data obtained in space and on the Earth's surface.

Space research done in Leningrad is justly acclaimed the world over. Starting with the first space missions, Leningrad-based space researchers launched wide-scale projects to study fundamental and applied problems of space science.

At present, scientists in the Soviet Union and other countries are most interested in studies of the Earth from space and of the atmospheric gas layers.

American researchers have accumulated considerable experience in this field. Their investigations in the Antarctic have revealed that the ozone ring's thickness is not uniform. The Antarctic is the continent of ozone holes, caused by the circumpolar air current influencing the distribution of near-Earth gasses.

Soviet scientists, for their part, have reached a conclusion that the atmosphere is mainly ruptured over the spacecraft launching sites. But these local holes are insubstantial and are soon filled.

Joint research in this field has provided the basis for the creation of the Soviet-American on-board instruments and decoding methods and for conducting a number of satellite-related experiments.

"Consequences of Iraq's arson with regard to Kuwait's oil wells were also considered by specialists in space research," the Soviet-American working group's leader, Professor Anatoliy Buznikov told TASS.

"Together with American colleagues, we have been watching from space the movement of the smoke and carbon dioxide tails. On the basis of these observations we supply recommendations to areas towards which the toxic cloud is moving."

In addition to ecologic observations, specialists from the two countries are working in the field of space instrument making, astronomy, astrophysics, biology and medicine. The results of their efforts are stored in a data bank accessible to Soviet and U.S. researchers.

## Meteor-3 Satellite Launched With U.S. TOMS Instruments

PM2208114991 Moscow Central Television First  
Program Network in Russian 1800 GMT 15 Aug 91

[From the "Vremya" newscast: Report by A. Gerasimov and V. Pankratov, identified by caption]

[Text] [Announcer] The Tsiklon booster rocket was launched today in the Soviet Union, putting the Meteor-3 satellite into orbit. Our correspondent reports from the Plesetsk Cosmodrome.

[Gerasimov] This is the first time that Americans have been admitted to the northern cosmodrome—thanks to the TOMS Meteor-3 joint project. While opening up to the whole world and engaging in cooperation—and not only in supplying raw materials—our state is also giving up totally unnecessary secrecy. We have already talked about the presence of military men at cosmodromes. Today, when the booster rocket was being brought out, the guests were given an honest warning about the dangers to people near the launchers. They eat up fuel. It's a bad joke. This is certainly one of the paradoxes of scientific progress. With one hand man does good works—here we have a joint program to save the earth's ozone layer—but with the other hand man poisons the land. This is an international problem. Suffice it to say that every shuttle launch destroys tens of millions of tons of ozone, whose disappearance will now be recorded by U.S. instruments aboard a USSR satellite. Why a Soviet satellite?

[S. Keller, NASA [National Aeronautics and Space Administration] deputy administrator, in English with superimposed Russian translation; identified by caption] We had no available satellite to carry our instrument into the right orbit. The Soviets have helped us to do this.

[C. Kout (name as transliterated), project head, in English with superimposed Russian translation; identified by caption] The level of technology and the quality of the Soviet side's work fully met all our requirements.

[Gerasimov] This unexpected optimism is certainly one of the better reasons for bringing into being the idea of a global system for keeping an eye on the earth's ecology from space.

[V. Zakharov, deputy chairman of the USSR State Committee for Hydrometeorology, identified by caption] I don't believe in God, but thank God it has ended like this.

[Gerasimov] So, Meteor-3 begins its work of safeguarding the ecology.

### Soviet Official Lauds Project

917Q0157A Moscow PRAVDA in Russian 15 Aug 91  
Second Edition p 3

[Article by Professor V. Zakharov, deputy chairman of the USSR State Committee for Hydrometeorology: "The Ozone Scout"]



[Text] The words "ozone layer" sound at present like a planetary alarm. A unique and frail atmosphere which has given rise to "the mode of existence of protein bodies," which to us is our multifaceted and still surprising, largely mysterious life, is facing the threat of destruction. "A hole" in its thinnest and most sensitive cover, the ozone layer, raises many issues with regard to the further existence of our ocean of air. It is increasingly jeopardized by the industrial operations of humanity. The composition of the atmosphere is changing right before our eyes due to the discharges of gas and aerosol particles. The concentration of these poisonous emanations surpasses all acceptable limits.

However, the notorious "ozone holes" became the most acute warning to earthlings. If this is indeed a destructive process capable of causing harsh ultraviolet rays to break through, we may foresee the subsequent disruption in the condition of ecological and biological systems, as well as climatic changes and global warming, in combination with changes in the concentrations of other gases. Increased ultraviolet radiation levels unfavorably affect the health of people, primarily their immune systems, by weakening the resistance of the organism to skin tumors and infectious diseases of various kinds. The influence on the immune system depends to some degree on the skin color and place of residence.

The perception of the changes underway in the physical environment and of their global nature has resulted in international cooperation and the creation of international scientific projects for counteracting this threat.

The joint Soviet-American project Meteor 3-TOMS [Total Ozone Mapping Spectrometer] is one such project. Its implementation will make it possible to monitor and study changes in the ozone layer of the atmosphere on a global scale.

A joint statement by the presidents of the USSR and the United States, in which it was noted that studying and preserving the ozone layer is one of the priority tasks of cooperation, gave the impetus for initiating this project.

The USSR State Committee for Hydrometeorology [Gosgidromet] and the U.S. National Aeronautics and Space Administration (NASA) are the leading agencies for this project.

In keeping with this project, it is planned to put yet another Soviet meteorological satellite, Meteor-3, into orbit from the Plesetsk space launch complex using our booster rocket. In addition to standard and scientific-research equipment, the TOMS spectrometer designed by NASA will be installed with a view to studying and mapping the global distribution of ozone over our planet, as well as accumulating data on its climatic variations. The project has been in preparation for more than two years, and has been implemented successfully, thanks to the striving to cooperate and the efforts of scientists, engineers, and technicians, primarily of the USSR Gosgidromet, the USSR Ministry of the Electrical Equipment Industry and Instrument Making, the USSR Ministry of Defense, and the U.S. NASA.

During this period of time, a number of meetings between Soviet and American specialists have been held, which made it possible to resolve organizational, scientific, and technical issues of compatibility of the TOMS device with the on-board system of the Meteor space vehicle, telemetry, equipment for the collection and discharge of information to acceptance centers located on the territories of the USSR and the United States, and processing and exchange of information.

These meetings have also made it possible for the specialists of the two countries to learn more about the issues and prospects for building satellite instruments, creating artificial satellites of Earth for hydrometeorological and geophysical research, and the organization of services for launching and controlling space vehicles. The main point is that these meetings reinforced their confidence in each other.

It should be noted that cooperation between the scientists of the USSR and the United States in the sphere of studying variations in the ozone layer dates back several years. Joint and international seminars have been held, programs have been implemented to study the ozone layer in the Arctic and the Antarctic using laboratory planes, Soviet ground instrumentation, and American ozone probes on balloons at Soviet aerological stations at Hays Island Franz-Josef Land, and in the Antarctic at Mirnyy station.

The TOMS spectrometer is a second-generation satellite instrument. Its performance is superior to that of instruments previously used on Soviet and American satellites. It measures the content of ozone by comparing descending solar radiation and that reflected by the surface of Earth on six wavelengths in the band of 310 to 380 nanometer.

After drawing up global maps of ozone content, the most important task of the scientists is to determine to what degree changes in the ozone content are associated with activities of human origin, in particular, with the production and consumption of chlorofluorocarbons, to what degree they depend on natural geophysical and hydrometeorological conditions (solar activity, circumpolar vortices, and so on), which is very important for adopting a further strategy for reducing the production and use of ozone-destroying compounds by humanity within the framework of the Vienna Conference on Protecting the Ozone Layer and the Montreal Protocol on the conference.

Before the development of satellite instruments for measuring ultraviolet radiation and ozone, these parameters were studied at ground stations using Dobson spectrophotometers (so named in honor of a scientist who was a pioneer in the area of ozone study) or instruments produced mainly in Canada and the Soviet Union. Despite their reliability, these data are insufficient because ozone is measured only immediately above the stations; the latter are situated mainly in the medium latitudes of the Northern hemisphere. However, ground stations are necessary for calibrating and tying in the data received from the artificial satellites of Earth because measurements

taken there are more precise and make it possible to track variations in ozone during the course of a day.

The employment of TOMS is also useful for monitoring sulfur dioxide in the atmosphere. The compilation of these maps makes it possible to observe the volcanoes of the world regularly and to measure sulfurous discharges during their eruptions. A sequence of such observations over several decades will make it possible to come up with a more accurate estimate of the contribution of a stream of volcanic sulfur into the overall balance of sulfurous compounds in the atmosphere.

The implementation of the Meteor 3-TOMS project will become the largest USSR and U.S. project in space since the Soyuz-Apollo program. It is an example of mutual cooperation between the two countries in the interest of the world community.

#### **South Africa Negotiating on Antarctic Forward Bases**

*MB1408113591 Johannesburg THE STAR in English  
14 Aug 91 p 6*

[Unattributed report: "Antarctic Missions Set To Start From Cape Town"]

[Text] Cape Town—Hundreds of millions of rands a year may soon flow into Cape Town as it becomes the international springboard for Antarctic research missions.

For the past few months South Africa has been negotiating with several countries—including the Soviet Union and Great Britain—to prepare for the establishment of forward bases for Antarctic missions in Cape Town.

Department of Environment Affairs spokesman Niel du Bois said he could not name the other countries involved in the negotiations because "at this stage the talks are too sensitive."

It appears that the Soviet rescue mission, launched on Monday to airlift 165 researchers and crew members from the iced-in Molodezhnaya base in Antarctica, was facilitated by the ongoing negotiations between the USSR and South Africa.

The international moves to transform Cape Town into forward bases follow after several countries approached the Department of Environment Affairs to investigate such a possibility.

#### **Malaysia Urges 'World Park' Concept for Antarctica**

*BK1708133191 Kuala Lumpur Voice of Malaysia  
in English 0800 GMT 16 Aug 91*

[Station Commentary By Bosco De Cruz]

[Text] Malaysia continues to display its concern for the protection of the environment, and especially so in the case for continents of Antarctica. Her delegates at the United Nations conference being held in Geneva have

repeated the call by several other equally concerned nations for the establishment of a nature reserve or world park in the icy continent.

The Malaysian representative, Mr. Hussein Haniff, has further stressed that the environmental issues related to Antarctica should be a matter of discussion by the United Nations and not just confined to the member countries of the Antarctic Treaty.

This is also the view of many other third world nations who feel that Antarctica's huge mineral and natural wealth should not be left to the sole management of the treaty members, but rather be treated as a common heritage of mankind as a whole. Some countries with vested interests in Antarctica seemed to entertain the idea that the continent is their own property. The United States is an example in this regard.

Just two months ago, the signing of an Antarctic Agreement to ban mining and oil exploration, and the conference had to be cancelled because of the U.S. refusal to be a signatory to the accord. In stating that it needed more time to study further compromise proposals, the United States also expressed its desire that the door should be left open for future generations to exploit the virgin continent. This resulted in an angry response from environmental groups, the Green Peace Organization in particular, which accused the United States of trying to sabotage all provisions in respect of environmental protection in Antarctica. Washington is clearly giving priority to its long-term interest above and beyond a course of preserving the continent in its unspoiled nature.

Antarctica constitutes [words indistinct] of the world's total land space. Geologists have speculated that the continent holds deposits of strategic materials, minerals including coal, and oil. This should be left as long as possible to be shared by the entire peoples of the world. The Antarctic Treaty was signed 30 years ago, and has 39 members of whom 26 have voting rights. Malaysia is of the view that the treaty should be enlarged to encompass all nations so that Antarctica becomes a common heritage of mankind.

Notwithstanding the negative aspects that cloud the Antarctic issue, there is encouragement in the fact that talks on marine pollution, waste disposal, protection of flora and fauna, and the impact of scientific missions are going on smoothly. What is needed now is the solution to the mining debate and reaching an agreement which will raise the possibility of turning Antarctica into a world park. This is the only solution to the preservation of the planet's last unspoiled continent.

Malaysia counts on many other countries to continue to champion this course.

#### **Beijing-Hosted Conference on Bering Sea Concludes**

*OW0208202791 Beijing XINHUA in English  
1531 GMT 2 Aug 91*

[Text] Tokyo, August 2 (XINHUA)—The second intergovernmental conference on fisheries in the international

waters of the Bering Sea ended here today, reaffirming the need to take urgent conservation measures for the living marine resources of the area.

About 80 delegates from the United States, the Soviet Union, Japan, China, South Korea and Poland attended the three-day conference. They noted that the pollock catch in the area has undergone a gradual decline.

A joint press statement, issued at the end of the meeting, said, "each delegation identified its plans to develop and implement on an interim basis monitoring of fishing operations in the area, including the use of scientific observers, inspectors, and real-time satellite tracking devices (transmitters). However, no common agreement was reached in this regard."

The participants agreed to meet again in November this year in Anchorage, Alaska, to continue their discussions on both long-term conservation and management measures as well as urgent interim measures in the area beginning January 1, 1992.

Speaking at the conference today, Jia Jiansan, the head of Chinese delegation said China constantly attaches great attention to the conservation, management as well as the rational use of the living marine resources of the international waters of the Bering Sea.

"As a pacific coastal country, China hopes to cooperate with other countries in this matter under the principle of common-use, common-preservation and management on the basis of equal footing of each country concerned," he stated.

The Chinese delegate stressed that based on the principles of spirits of the United Nations convention on the Law of the Sea, various countries concerned should seek a reasonable solution through their mutual understanding, equal participating and friendly consulting."

The first conference on the conservation and management of the living marine resources of the Bering Sea was held in Washington on February 19-21 this year.

### **Expedition To Study Radioactivity in Arctic**

*PM1508132191 Moscow IZVESTIYA in Russian  
12 Aug 91 Union Edition p 5*

[Correspondent M. Zubko report: "International Expedition Aboard the Icebreaker Oden. Are There Traces of Radioactivity in the Arctic?"]

[Text] Stockholm—The modern Swedish icebreaker Oden set sail for the extreme northern latitudes of the Arctic a few days ago. The ship is carrying an international expedition of scientists which will study this region of the earth, especially as regards the presence of radioactive fallout there.

Swedish journalists aboard the icebreaker confirm that the Oden will sail through the waters of the Barents and Laptev Seas and then try to break through the ice as close to the North Pole as possible. The crew and scientists hope

that they will be able to go beyond those latitudes, once visited by the legendary Nansen aboard his famous ship, Fram.

They are not certain that they will be lucky enough to repeat the achievement of the Soviet icebreaker which reached the North Pole, but the expedition's objective is not to conquer the "roof" of the world but to carry out systematic scientific research.

One of the main tasks is to ascertain whether radioactive fallout has occurred in the Arctic and, if so, in what amounts, from where, and whether it exerts a substantial influence on the environment.

And the international expedition will try obtain an answer to the question of whether the radioactive clouds containing discharges from the Chernobyl nuclear power station reached the extreme northern region. But their work is by no means limited just to that. The scientists have set themselves the goal of detecting traces of radioactive discharges produced in Britain and France, determining the presence of "traces" left by nuclear submarines after they blow their tanks, and ascertaining what consequences the atomic and hydrogen weapons tests in the fifties and sixties, as well as in our own time, including those carried out in Novaya Zemlya, have had for the region.

But how is this to be done?—the reader will certainly ask. Elis Holm, leader of the expedition and representative of Lund University in Sweden, answers this question:

"Different radioactive discharges have their own specific features. We will be able to distinguish, for example, the fallout that has occurred since the Chernobyl accident from the indicators of atomic submarines. It will be interesting to find out what has happened to those 'traces' and what impact they have had on the environment..."

A distinctive feature of the extreme northern region, according to Elis Holm, is that the sea and ocean currents drag ice floes with them along their routes. And if the ice has radioactive fallout on it, that fallout can eventually end up very far from the place it occurred. When the ice begins to melt, however, the fallout "disappears" into the water wherever the currents have brought it.

Throughout the voyage, which is planned to last three months, the Oden expedition will be taking samples of air, water, and ice. And then, in December 1991, they will be compared with data obtained by scientists who have carried out scientific research from German and U.S. vessels.

But that is not all. The Oden expedition members plan to put all the information obtained on computer. The scientists hope that these data held in computer memory banks will help forecast the consequences of catastrophes that may occur in the future.

### Japan To Propose Advanced Nations Carbon Dioxide Emissions Target

*OW0708175191 Tokyo KYODO in English 1124 GMT  
7 Aug 91*

[Text] Tokyo, Aug. 7 KYODO—Japan will propose stabilizing carbon dioxide emissions at 1990 levels by 2000 as a common target for all advanced nations, government sources said Wednesday.

Japan will put the proposal at a September meeting in Nairobi to discuss a convention on the prevention of global warming.

The European Community (EC) has already adopted a similar goal and Japan's decision puts pressure on the United States, the sole major economic power not to set such a target.

Environment Agency Director General Kazuo Aichi, attending a meeting of the Liberal Democratic Party's [LDP] committee on global environmental issues, promised the government would set its sights on the goal, the sources said.

Masahisa Aoki, chairman of the LDP panel, urged Aichi to make every effort to include the target in the convention and said Japan should take the lead in protecting the environment and do its utmost to establish a common target for advanced countries to limit emissions of hot-house gases, particularly carbon dioxide.

He said, if necessary, the "pledge and review" policy in regard to the setting of and achieving targets previously agreed by the committee would be improved to make it easier for developing countries to agree to the convention.

The Ministry of International Trade and Industry previously opposed setting a common target for advanced countries out of consideration for the United States, but Aoki told the committee the government should be more forthright on the matter.

### China's Premier Addresses Symposium on Developing Countries, International Environmental Law

*OW1208143491 Beijing XINHUA in English  
1419 GMT 12 Aug 91*

[Text] Beijing, August 12 (XINHUA)—Chinese Premier Li Peng said today in Beijing that China has long attached great importance to environmental protection which is a basic state policy.

China has not only strived for protecting the ecological equilibrium at home, but has also actively participated in international efforts to protect the world environment, said Li.

The Chinese premier made these remarks during an afternoon meeting with experts and scholars from various countries who came to China to attend a symposium on the developing countries and international environmental law.

According to a Chinese official present at the meeting, Li said that the recent ministerial conference of developing countries on the environment and development, which was held in Beijing, adopted the "Beijing Declaration." According to Li that conference and the current symposium are amongst a series of activities which will play a positive role in promoting environmental protection in the developing countries and throughout the world. Li expressed his hope that the symposium would be highly successful.

Li said that China is a developing country which is presently engaged in modernization construction. He pointed out that as is true with other developing countries, China faces a contradiction between development and environmental protection. As part of an effort to solve the problem, China has drafted a policy for both development and environmental protection.

The Chinese premier presented a review of China's efforts to cooperate with other countries to protect the environment, and pointed out that environmental pollution has no national boundaries. Therefore, according to Li, it is very important for all countries to cooperate with each other.

Environmental protection should also be an important content for North-South cooperation, said Li.

Developing countries put forth great effort to protect the environment in their respective countries. However, it is also the responsibility of developed countries to render their support and assistance. The developed countries should understand the special conditions and provide assistance for the special needs of the developing countries, he added.

Li expressed his belief that as long as countries maintain an active attitude and under the direction of the United Nations, it is possible to draft an international law on environmental protection.

During the meeting, Dr. M.K. Tolba, under secretary-general of the United Nations and executive director of the UNEP [United Nations Environment Program], described China's efforts and achievements in environmental protection as internationally acknowledged. Tolba agreed with the Chinese premier's views concerning the policy of joint development and environmental protection, and expressed his hope that China will display an even greater role in drafting an international law for environmental protection.

Earlier this morning, State Councillor and Foreign Minister Qian Qichen and Dr. Tolba both presented speeches at the opening ceremony of the symposium.

### Conference on Problems of Caspian Sea

#### Results of Conference Outlined

*91WN0598A Baku BAKINSKIY RABOCHIY  
in Russian 18 Jun 91 pp 1-2*

[Article by Kh. Imanov and V. Shulman, Azerinform correspondents: "The Caspian, an Arena of Cooperation: The International Conference on Problems of the Caspian"]

[Text] The First International Conference on Problems of the Caspian, which lasted for five days in the capital of Azerbaijan, ended today with the adoption of a package of proposals to help develop a comprehensive program to save the largest lake in the world.

The creation of a preparations committee to organize the Supreme Caspian Council was another result of this representative forum which brought together in Baku the leaders of nature protection departments and ecological commissions of the Union republics and leading Soviet and foreign scientists. This nongovernmental organ will be given the greatest powers. It is supposed to combine the efforts of the states of the Caspian region to stabilize and normalize the economic situation on the Caspian.

The resolution of the conference, which Professor V. I. Lukyanenko, honored scientist of the RSFSR, read to its participants, illustrates this. As became known from his statement, the preparations committee has been instructed to formulate the necessary materials to form the Supreme Caspian Council and define its basic functions and tasks, structure, and status within a two-month period. This important document also expressed the request to the presidents of the region's states to introduce the institution of republic ecological commissions, which will work under the Council's leadership.

The conference participants appealed to A. N. Mutalibov, the president of the Azerbaijan Republic, to head the Supreme Caspian Council.

"Such interaction on the Union and international levels," U. K. Alekperov, the vice president of the Azerbaijan Republic Academy of Sciences, emphasized, "will allow us to make a general evaluation of the ecosystem of the sea and of the enormous territory adjacent to it, establish the priorities of the problems existing here and the mechanism to realize them, and coordinate national plans and formulate the concept of a unified regional program to save the Caspian. We must also lay the legal foundations for rational use of nature and formulate recommendations on the directions of further cooperation of the states involved in this."

The conference participants also appealed to the governments of the Caspian region states to create a regional fund to save the Caspian.

The appeals to UN Secretary General Perez de Cuellar and the world community adopted at the conference among other things say that based on the consequences of the Aral catastrophe, one can assert with certainty that the scale of the ecological crisis of the Caspian Sea would be global. Taking into account the uniqueness and climate-forming significance of the Caspian and the need to preserve the diversity of living nature for world civilization and prevent the negative consequences of technogenic development, the First Baku International Conference deemed it necessary to bring the attention of the world community to the problems of the Caspian Sea.

Bearing in mind the crisis status of the economies of the Caspian region republics, the documents continue, we

appeal to all international organizations and funds to provide assistance in this important and noble cause.

The conference participants expressed the hope that the United Nations and its structural subdivisions and international ecological societies and movements will be moved by alarm and concern and will provide assistance in organizing the International Fund To Save the Caspian Sea.

In connection with this, the conference participants adopted the Statement to USSR President Mikhail Sergeyevich Gorbachev which expressed profound gratitude to the leader of the Soviet State for the attention to resolving the most important ecological tasks facing the peoples of the Caspian region.

Considering the significance of the Caspian for the entire world community, the global nature of the impending cataclysm, and the impossibility of resolving these problems through the efforts of the states of the Caspian region alone, the conference participants, recognizing the international authority of the president of the USSR, appealed to him to support the conference's appeal to the world community and provide assistance in the cause of creating an International Fund To Save the Caspian Sea.

The appeal of the children of Azerbaijan to M. S. Gorbachev read at the conference is also full of pain for the fate of the Caspian.

Overall about 50 reports, speeches, and messages of scientists and specialists in the area of marine ecology and representatives of public organizations were made during this representative scientific forum. All of them were carefully reviewed during six plenary meetings, one of which was held on 15 June on board a motorboat which traveled to Neftyanne Kamni, an oilfield city on piles in the open sea. Here the conference participants were introduced to films of Soviet documentary film makers which tell about the irreparable damage which the merciless exploitation of its resources and contamination of its waters with industrial run-off from the Volga have done to the Caspian.

The sinister circles of oil creeping across the water, the flares of liquefied natural gas which burn in the wind around the clock, and their smoke which covers the horizon—this is by no means a complete list of nature's accusations against man. The pile-supported little towns of Azerbaijan maritime oil workers where valuable raw material has been extracted from the bottom of the Caspian for more than 40 years also look unsightly now.

"All this is staggering," M. M. Alklychev from Makhachkala, the senior scientific associate of the All-Union Scientific Research and Planning Institute of Geophysics, said on board the boat. "It is difficult to imagine that this is the work of the hands of man. It is important to analyze all the mistakes made and not repeat them. The geophysical processes occurring within the depths of the earth are also important, in my opinion. We must not intervene in natural processes in an uncontrolled way, without careful

consideration. That might lead to unpredictable consequences. And in this regard extraction of oil is no exception."

V. P. Ivanov, the director of the Caspian Scientific Research Fishing Institute of the USSR Ministry of Fish Industry is more optimistically inclined.

"Work to introduce ecologically clean technologies everywhere may be done within five-six years," he believes. "And other nature protection measures may be carried out during that time. The most important thing is to insure that what has been planned does not remain on paper, as has happened more than once before. The know-how of other countries, the United States, Canada, and Great Britain in particular, must be used extensively in this work, for instance the use of strict economic penalties. Conditions must be created where it would be unprofitable for industrialists to pollute this unique body of water."

In the scientist's opinion, specialists must also be united by creating a unified center to save the Caspian which could develop a strategy of struggle and an order for carrying out scientific programs.

"I am not an advocate of categorical statements," he added, "'either oil or fish.' Man needs both the one and the other. We just have to find the 'golden mean,' and it would be rational to achieve all this on a profoundly scientific basis."

On 16 June the conference participants visited Khachmasskiy Rayon in Azerbaijan. This zone, which borders the shoreline, is well known for its fruit orchards and vegetable plantations. The delegation also visited the coastal part of the Yalam-Nabranskiy Zone, where endemic broad-leaved forests are located. The encroachment of the Caspian is especially obvious here. The roads laid not far from the shore which the participants followed are almost flooded. The water threatens to flood the boarding hotels, houses of rest, and pioneer camps here.

The accusatory photo exhibit housed in the republic Academy of Sciences next to the meeting hall of the forum, which finished its work on 17 June, also recalls the obstinacy of the sea and man's careless attitude toward nature and their consequences.

So, the First Baku International Conference on the Problems of the Caspian became a part of history and an important milestone in the evolution of interrelations of man and this unique body of water. From now on it will be an arena of international cooperation. There is great and responsible work ahead to save the Caspian.

E. M. Kafarova, the chairman of the Azerbaijan Republic Supreme Soviet, and F. G. Muradaliyev, the secretary of the Azerbaijan CP Central Committee, took part in the final plenary meeting.

### Azerbaijan Environment Chief on Conference

91WN0598B Moscow DELOVOY MIR in Russian  
21 Jun 91 p 1

[Interview with A. Mansurov, chairman of the republic State Environmental Protection Committee, by Namik Azizov in Baku; time and date not specified]

[Text] On 17 June the First International Conference on Problems of the Caspian Sea, organized at the initiative of the Academy of Sciences and the Azerbaijan State Environmental Protection Committee [Goskompriroda], finished work in Baku. Scientists and specialists of the USSR, Iran, Turkey, and representatives of UNESCO and UNEP [UN Environment Program] and international ecological organizations participated in it.

DELOVOY MIR correspondent Namik Azizov met with the chairman of the Azerbaijan Republic Goskompriroda and asked him to tell about the forum's goals.

[Mansurov] The initiators for holding the International Conference pursued, one might say, a three-part goal. First, to direct the attention of the Soviet and world communities to the ecological problems of the Caspian Sea. Secondly, to consolidate the scientific and ecological communities of countries of the Caspian region to solve the urgent ecological problems. Finally, to combine the efforts of the state and scientific research establishments working on preserving and studying the natural environment into a unified comprehensive program to save the ecosystem of the Caspian Sea.

The conference's program was compiled in such a way as to ensure that scientists and specialists from Russia, Kazakhstan, Turkmenistan, and Dagestan as well as Turkey and Iran could become thoroughly familiar with the ecological situation.

It is no secret to anyone that the Caspian has been chronically ill for a long time. The anthropogenic load on the Caspian ecosystem is so great that if an instrument existed which could measure it, the reading would have been off the scale long ago.

Many departments have made and continue to make their contribution to destroying the ecosystem of the Caspian. They include those which pollute the sea with oil and petroleum products, sewage, and sludge and discharge millions of tons of dust and other harmful substances into the atmosphere. As a result, the Caspian Sea, known throughout the world for its huge reserves of sturgeon and beautiful sandy beaches, has become an all-Union settling tank where many species of animal life remain only names in the Red Book and swimming in its warm waters is dangerous to health.

The national wealth of Azerbaijan, petroleum, has brought the republic countless ecological disasters instead of economic prosperity. More than 25,000 hectares of land, and of that 10,000 on the Apsheron Peninsula alone, are completely or partially contaminated with petroleum products and layer waters escaping from wells.

Petroleum extraction sectors, it must be said directly, are now unprofitable for the republic; their technological equipment does not meet elementary demands of ecological safety and serves as one of the basic causes of pollution of the Caspian Sea. But this is not only the largest lake in the world. It is a unique regulator of the climate which levels the amplitudes of air temperature fluctuations of the entire Caspian region. The Caspian supplies moisture to many regions of Europe and Asia, delivering an enormous quantity of water vapor into the atmosphere. And finally, it serves as the only obstacle to the spread of the Central Asian deserts.

In recent years one more, most terrible illness has been added to the list of illnesses of the Caspian. I mean the change in the level of the sea; in the last 15 years it has risen by almost two meters. And this process is not ceasing. Unfortunately, as yet there are no scientifically sound predictions of the dynamics of its development. Just the economic losses from the fluctuations of the level of the sea will be measured in hundreds of billions of rubles.

In the last decades we have witnessed many ecological catastrophes. The fate of the Aral is right in front of us all. Fortunately, the damage to the Caspian has not reached the level beyond which the process is irreversible. And we still have a chance to act in advance to begin normalizing the ecological situation in time.

It is clear to everyone that no one state of the Caspian region can deal with the common misfortune by itself. Consolidated efforts, combined scientific, technical, and technological potential, and active involvement of capital and the capabilities of the international community are needed.

We hope that the First International People's Conference on the Caspian will not be a one-time event, but will initiate the process of regular contact of the region's scientists and specialists and their joint participation in large-scale nature protection measures. On our part we intend to present an initiative to organize the International Fund To Save the Caspian.

## Conference on Problems of Black Sea

### Action Program Adopted

AU0608114691 Tbilisi SAKARTVELO RESPUBLIKA  
in Georgian 23 Jul 91 p 1

[SAKINFORM report: "Let's Save the Black Sea"]

[Text] As we have informed you, an international conference entitled: "Let's Save the Black Sea" was held in Batumi on 13-14 July on the initiative of Georgia's Greens.

It was agreed at the conference that in November of this year, all the countries of the Black Sea basin will organize a cleanup of their shorelines. On the initiative of the Ukrainian Green Party, a preparatory international organizational committee has been created that will organize action by the Greens on a wide scale in 1992; on the

proposal of the Turkish Green Party, a special international newspaper will be published in Turkey devoted to the problems of the Black Sea.

It was particularly emphasized at the conference that every effort must be made in order to implement the complete demilitarization of the Black Sea and to remove Soviet and NATO military bases. Today, following the dismantlement of the existing totalitarian regimes in the Black Sea states, we have an historical opportunity to transform our common sea into a zone of peace and cooperation and ecological security.

The conference aroused great interest among international environmental protection organizations and Green parties from many countries.

A very positive evaluation was given of the interest being shown by the Georgian Government in regulating the problems of the Black Sea, which has been manifested in the welcome given to the conference by Zviad Gamsakhurdia, the republic's president, and by the fact that the Republic of Georgia Supreme Council has covered the costs of organizing the conference.

The conference adopted a resolution which states:

We, the participants of the international meeting in Batumi devoted to the problems of the Black Sea, express extreme concern at the very serious ecological situation that has been created in the Black Sea. The existing situation calls for the immediate adoption of drastic measures. In connection with this, we consider it necessary:

1. To declare the Black Sea an ecological disaster zone; to create an international commission comprising experts from the UN and other international organizations that will elaborate an international program for saving the Black Sea.
2. To conclude, in the course of one year, an international convention on the protection of the Black Sea's environment and on the improvement and stabilization of the situation that will be signed by Turkey, Georgia, the Russian Federation, the Ukraine, Bulgaria, and Romania.
3. To determine the responsibility of the Danube countries for the serious ecological situation that has been created in the Black Sea and, accordingly, to detail their participation in the international convention on the protection of the Black Sea and in programs of scientific and technological cooperation.
4. To make an immediate start on compiling ecological data for the entire coastline of the Black Sea, establish the level of pollution, and single out ecological zones of conflict; to review the current maximum pollution limits taking into account contemporary data and methods.
5. To take an inventory of cross-border pollutants; to impose strict international control on the transportation of such pollutants.
6. To create a joint ecological-geophysical monitoring system based on a synthesis of experimental observation

and mathematical models; to initiate the free exchange of ecological and other information for the purpose of creating appropriate centers in towns located on the Black Sea coastline and in the capital cities of the Black Sea countries; to develop scientific and technological cooperation on a broad scale.

7. To declare the Black Sea a non-nuclear zone and to implement the dismantlement of Soviet and NATO military bases along the whole Black Sea coastline; to implement the consecutive conversion of existing military installations.

8. To establish permanent sea alert duty for which purpose each country is to provide at least one ship; to create an international ecological patrol.

9. To declare the first week in April and the last week in November each year as days for cleaning up the Black Sea coastline.

We note with satisfaction the active role that Turkish President Turgut Ozal and Georgian President Zviad Gamsakhurdia are assuming in connection with the problems of the Black Sea although we believe that it is time we switched to concrete actions.

It has to be categorically stated that, in addition to the governments of our countries, the population must also assume the greatest responsibility for resolving the current problems. We attach particular importance to the development of cooperation between the Greens of the Black Sea countries not only in order to conduct ecological and antimilitaristic campaigns but also to strengthen cultural and economic contacts between our countries. Therefore, we agree to continue to hold meetings in the future and to implement joint cultural, ecological, or other initiatives.

#### Republic of Georgia Initiatives

AU0808114591 Tbilisi SAKARTVELOS RESPUBLIKA  
in Georgian 25 Jul 91 p 3

[SAKINFORM report: "The Georgian President's Initiative Is Receiving Support"]

[Text] During the last two decades, the sharp deterioration in the ecological situation in the Black Sea has reached a dangerous limit. Each year, hundreds of tons of petroleum products and various organic and mineral compounds end up in the sea. There has also been a considerable increase in bacteriological pollution. In certain coastal regions diseased microflora has appeared that is threatening the existence of the sea's biocenosis and the use of the shoreline for recreational purposes. The problem of the pollution of the Black Sea has become alarming.

With the arrival of national forces to power in Georgia, a number of governmental initiatives in connection with the ecological problems of the Black Sea have begun to be implemented. Here are several facts and documents.

In June of this year, a forum of the Krano-Montana Fund was held in Switzerland at which one of the central questions presented was the ecological problem of the Black Sea.

Tengiz Sigua, chairman of the Government of the Republic of Georgia, Minister of Foreign Affairs Giorgi Khoshtaria, and Ramin Jomidava, representative of the initiative group of the Georgian public, participated in the work of the forum. The republic's president sent the following message to the forum's participants:

"The Black Sea, which is a unique basin of the planet, is on the verge of an ecological crisis. It is being intensively polluted with industrial and domestic wastes. The ecosystem's biocenosis—fish, mollusks—are on the verge of extinction.

It must be stated that the hydrogen sulphide layer is gradually increasing.

Therefore, I call upon the governments of those countries that are interested in the problems of the Black Sea to cooperate with one another.

I propose that an intergovernmental commission on the ecology of the Black Sea be created under the aegis of the UN.

The Government of the Republic of Georgia will create all the conditions for the aforementioned UN commission to enable it to form an organizational committee and will promote its successful work.

I trust that you will give thoughtful consideration to my proposals."

The message from the republic's president aroused great interest among the participants of the forum. The press gave wide coverage of questions connected with the president's initiative.

Discussion of the ecological problems of the Black Sea was continued on 11-12 July in Moscow at a meeting of the deputy foreign ministers of those countries interested in this issue.

As Batoni [Georgian polite form of address] Ramin Jomidava informs us, the countries interested in the problem of the Black Sea announced their agreement in principle with the proposal of the president of the Republic of Georgia—to create an international secretariat in Georgia that will organize operations connected with the stated problem.

A whole number of famous international organizations have expressed the desire to participate in work connected with the problems of the Black Sea.

A little later, on 13-14 July, on the initiative of Georgia's Greens, an international conference entitled "Let Us Save the Black Sea" was held in Batumi. Delegations from Green parties and environmental protection organizations, scientists, and specialists from Georgia, Turkey, the Ukraine, and Bulgaria and representatives of the Republic of Georgia Supreme Council and the Ministry of Ecology and the Utilization of Natural Resources participated in the conference.



A number of interesting agreements on topical questions pertaining to the improvement of the ecological situation of the Black Sea and its salvation were concluded at the conference.

Recently, the following document addressed to Zviad Gamsakhurdia, president of the Republic of Georgia, arrived from Moscow:

"Your Excellency! We are sending you the enclosed draft message from E. A. Shevardnadze, president of the Foreign Political Association, to the heads of government of the European states and also of the United States, Canada, and Japan that concerns the problem of the ecological situation of the Black Sea basin and urgent international measures aimed at its salvation.

The draft was prepared in Switzerland in connection with the corresponding request of the initiative group of representatives of the Georgian public that participated in the meeting on problems of the Black Sea held in the town of Krano-Montana.

We would be grateful if you would let us know how you view this step." The letter is signed by P.S. Akopov, acting director of the Foreign Political Association, ambassador extraordinary and plenipotentiary.

Batoni Eduard Shevardnadze's draft message is of great interest. It states:

"The problem of the ecological situation in the Black Sea that has compelled me to write this letter to you does not only concern the narrow national interests of the ecological security of a region that is standing on the path of degradation. It is, to say the least, a common European, partly Asiatic and, in the final analysis, a global problem. As is well known, negative ecological processes do not recognize any boundaries, and they can transform any nation into a hostage of passive indifference on the part of official state structures toward questions connected with the anthropological effect on the environment.

The problem of the Black Sea, which, at the same time, is also inextricably linked to the problem of the Mediterranean Sea, is viewed by the international community as an ecological danger that is a threat to the whole of mankind....

The necessity for an immediate resolution of this problem and its vital significance give me the moral right to request that you familiarize yourselves with the enclosed materials and make known your views and suggestions for the practical implementation of the ideas proposed in them.

Without anticipating the final conclusion that will be drawn by those participating in the discussion of this question, I would like to hope that you will view with understanding the necessity of creating a working mechanism and an appropriate organizational structure that will be capable of implementing the harmonic coordination and integration of the efforts of the countries of the basin in order to achieve the stated aim. The Government of the

Republic of Georgia is ready to create the appropriate conditions for the normal functioning of the newly formed international organization....

I await your concrete ideas and proposals in connection with the stated question which would enable us to hold a meeting in the near future to summarize them."

We will point out here that, prior to the composition of this letter, Batoni Eduard Shevardnadze was in correspondence with the republic's leaders on this subject. In particular, from our republic, he received a letter from Tengiz Gvirishvili, an adviser to the president of the Republic of Georgia, doctor of physicomathematical sciences, and committee member of the International Association of Meteorology and Atmospheric Physics. The letter states:

"The ecological situation in the shelf and depths of the Black Sea basin is becoming increasingly critical and alarming. Zviad Gamsakhurdia, president of the Republic of Georgia, in his letter to the participants of the forum that was held in the town of Krano-Montana (Switzerland), noted with particular concern that unpredictable cataclysms could occur in the Black Sea basin.

To prevent a catastrophe occurring in the Black Sea, what we need are not individual expeditions on a small scale but comprehensive and detailed research on a large scale conducted not only by the Black Sea countries but also with the help of the developed countries and with their direct participation.

I am empowered by the president of the Republic of Georgia to convey to you that he fully supports your initiative to send a special message to the heads of the world's leading countries."

Batoni Zviad Gamsakhurdia's initiative has aroused the interest of scientists from other countries. The president has received letters from scientists from different countries in which they express their readiness to cooperate with Georgian specialists to resolve the ecological problems of the Black Sea. Here, in particular, is what Academician Valeriy Belyayev, chairman of the Commission on Problems of the World Ocean attached to the Presidium of the Ukrainian Academy of Sciences, writes:

"Together with specialists from this region of the country, Ukrainian oceanologists are planning to expand ecological research in the Black Sea and are ready to establish contacts with Georgian specialists."

#### **Latvia Hosts Meeting on Baltic Sea Problems**

*91WN0616A Tallinn SOVETSKAYA ESTONIYA  
in Russian 1 Jun 91 p 2*

[Article by O. Senetskiy, candidate of juridical sciences, Eastern Baltic pisciculturalist: "The Baltic: Yesterday, Today, and Tomorrow"]

[Text] The second international scientific-practical seminar entitled "The Baltic Sea: Yesterday, Today, and Tomorrow. The Problem of Setting Penalties for Damage Caused to the Environment" was held in Riga. Taking part in its work

were legal experts, economists, historians, and experienced workers in the field of environmental protection; they came from Latvia, Lithuania, Estonia, Poland, Leningrad, Moscow, and Odessa.

Let me say a few words about the Baltic Fund itself. It was constituted in 1988 as a voluntary, independent, public organization, called upon to solve problems of protecting the environment in connection with carrying out various types of activity at sea (industry, navigation, extracting minerals, recreation, etc.). The Fund's links are very extensive: In addition to the Baltic countries and a number of republics in the Soviet Union, it has contacts with the UN Program for Environmental Protection, the Eco-Baltic Fund, the Maritime Institute and Institute of International Relations (Poland), the University of London, Roskild University (Denmark), the Bulgarian Association of Maritime Law, the Cultural and Educational Society of the Land of Hessen (Germany), the French Association of Maritime Law, and others. The Fund publishes a journal entitled *BALTIYSKAYA VOLNA* [The Baltic Wave] in Russian, Latvian, and English; the first issue has already come out. Well-known specialists write in its pages about international cooperation in the cause of cooperating in the protection of the environment of the Baltic Sea, the Baltic's continental shelf and about ecology in Estonia two centuries ago, etc.

And at the above-mentioned seminar itself interesting reports were delivered by the Polish scholars L. Lukaszuk and Z. Knypl (problems of recovering damages for ecological violations in accordance with international and national law), by Candidate of Juridical Sciences J. Bergkholtzas (on the influence of international legal norms on national ecological legislation). Candidate of Juridical Sciences A. Marcienas from Vilnius examined the specially preserved natural territories in Lithuania from the standpoint of penalizing and recovering for damages, Ja. Bruneiks from Latvia's Ministry of Economics dealt with the economic and legal regulation of utilizing the natural environment, and Candidate of Economic Sciences A. Zhivitskiy from Odessa treated the problems of effectively utilizing the natural environment for recreational purposes.

The presentation by the author of these lines (unfortunately, the only participant from the Estonian Republic) emphasized the need for joint actions by all the Baltic states to protect the Baltic Sea's ecological system. To be more specific, I stressed the necessity of creating an international system of controls to monitor the observance of measures for protecting the Baltic's environment and resources.

Based on my own experience, I can affirm that international monitoring controls constitute an extremely important means of environmental protection. Nevertheless, I must acknowledge that—up to now—this has been a weak spot in many environmental-protection treaties, including the Convention on the Fishing Industry and the Protection of Live Resources in the Baltic Sea (1973) and the Convention on Protecting the Maritime Environment of the

Baltic Sea Region (1974). Traditionally speaking, hopes have been basically placed on controls exercised by countries in their own waters.

But the Baltic Sea is not a conglomerate of six (or more) "national" seas, but rather a single, international body of water. And the protection of its ecological system is an imperative for each Baltic state individually and for all these countries together.

In the future, of course, the foundation of both the conventions cited above must be built upon by another one—a Convention To Protect the Baltic Sea's Ecological System (the Baltic Fund and scholars from several other countries are leaning toward this idea). It would take under its protection the maritime environment together with its live and mineral resources as a single, integrated whole. On this level, protecting just one's own "garden" would not produce the necessary effect.

Already now, however, my proposal has been boiled down to the point whereby the Baltic countries would agree to form an INTEGRATED SYSTEM OF INTERNATIONAL MONITORING CONTROLS, based on the inspection services existing in each of them for protecting the environment and resources. The inspection ships (coast guard vessels) of each country would go out into the sea flying the pennants of the presently functioning international commissions, and the inspection group could include staff members from several Baltic states, thereby forming the International Baltic Ecological Inspectorates (MBEI). For example, the MBEI from the inspectorates of the USSR, Finland, and Sweden could operate in the Northern Baltic, whereas those from the inspectorates of Denmark, Sweden, Germany, and Poland could operate in the Southern Baltic. They would have the right to keep track of the sea's purity and the observance of the fishing regulations at each point of the sea, regardless of the borders of the domestic and territorial waters, or those of the economic and fishing zones. A great deal of assistance could be rendered by helicopters and airplanes.

It's a well-known fact that the principal sources of polluting the maritime environment (aside from extraordinary accidents to tankers) are those rivers which bear the most diverse pollutants and toxic substances down to the sea. A system of international monitoring controls would be able to provide for siting in the estuaries of the major rivers (the Neva, Daugava, Vistula, and others) of permanent, international observation posts for monitoring the condition of the river water. At various points in the sea we could set out automated buoys (the idea of the Estonian lawyer K. Lindpere), which would monitor the condition of the maritime environment and—in case the pollution level rose—would send a signal to the shore as well as to the international inspection ships.

At the same time we must see to it that, within the framework of the presently existing or future, integrated ecological convention, the countries involved work out more stringent measures both as to regulating the fishing industry and as to protecting the maritime environment. But we must not, indeed, consider the presently existing

system to be optimally effective whereby—in conducting dredging operations in ports polluted by petroleum and heavy metals—the soil is simply hauled away and buried in a deeper place in the sea. The amount of the fine to be paid by the parties guilty of causing such damage is considerable, but, of course, this does not help the sea at all. It's as if a patient were to have a rusty needle thrust into his body and left there; and then a certain sum of money were to be awarded to him.

As people say, with consent, small matters become big ones, but with non-consent, even big ones can collapse. It would be desirable, therefore, if Estonia also were to form a public, independent fund along the lines of the Latvian

one, which would unite the efforts of scholars, specialists, and experienced workers in the area of protecting the Baltic Sea's ecological system (there is a similar organization in Lithuania, and it is called "Lithuania for the Baltic").

But along the state lines it is utterly necessary that all the environmental-protection services of the Estonian Republic be united under one "roof": nature is an integrated whole, and common efforts are needed to protect it. This is indisputable and understandable even to school children, but—for some reason—it continues to be a subject of long, drawn-out discussions among the "statesmen" here in the Estonian Republic.

## ANGOLA

### UN, Angolan Officials Participate in Environmental Awareness Seminar

91P40398A Luanda JORNAL DE ANGOLA  
in Portuguese 17 Jul 91 p 2

[Text] A seminar entitled "Sustainable Development," held by the Angolan Ecologic Youth (JEA), has been underway since yesterday in Luanda in the 10 December Palace to discuss, among other things, issues relating to environmental awareness on our continent where deforestation threatens human and animal life. The first workshop of the seminar, "What is Sustainable Development, Theory, and Experience," was presented by Dr. Otto Essien, UNDP [United Nations Development Program] representative and UN coordinator in our country. Otto Essien started out by explaining that sustainable development comprises two fundamental concepts: first and foremost, the needs of the poor, and second, the limitations imposed by the State, technology, and social organization on the capacity of the environment to meet future needs. He added that "when we speak of sustainable development we are first of all speaking about our own socioeconomic development: the alleviation of poverty and the providing of water, food, and other services to meet human needs." The UN coordinator in our country discussed the mechanisms by which developing countries could obtain financing for sustainable development programs and mentioned the necessity of protecting the most vulnerable sectors of the population. He also mentioned topics to be discussed next July in Brazil at the World Conference for Environmental Development, such as correcting climatic changes and a letter delineating guiding principles toward the environment, among others.

Dr. Serodio de Almeida, of the Angolan Environmental Association, addressed the topic of environmental awareness in Angola and mentioned that "a successful environmental campaign can be carried out only if we know our resources." He went on to say that ecology is a recent science studied only since 1975. "The question of environmental awareness only became important when UNESCO and UNEP [United Nations Environment Program] were able to establish the first guidelines for the defense of the environment." He stressed that environmental protection cannot be undertaken without development. "We have to develop the science through better utilization of natural resources for the benefit of the population."

Another speaker at the seminar, which was heavily attended by young environment advocates, was Dr. Elisa Andrade of UNESCO, who stated that in order for environmental education to be well understood in our country, it is imperative that it be taught from elementary through intermediate school and be included in extracurricular activities.

She compared, at length, the difference in environment between industrialized countries and developing countries, particularly Africa, and quoted passages from

UNESCO documents produced at international conferences on the environment, especially the one held in Belgrade.

The seminar will continue today with the panel "Policies and Strategies on the Environment and Sustainable Development in Lusophone African Countries," led by Dr. Nelson Cosme, head of the UNDP program and by engineer Paulo Vicente of IDF [Forestry Development Institute]/MINADER [expansion not given].

Angolan Ecologic Youth will present a report on the role of youth in the conservation of the environment and its contribution toward sustainable development. The opening statements at the seminar, which will close today, were made by Minister of Agriculture Isaac dos Anjos representing the chief of state, Jose Eduardo dos Santos.

## SOUTH AFRICA

### National Environmental Management System Studied

91WN0590A Cape Town WEEKEND ARGUS  
in English 15 Jun 91 p 5

[Article by Frans Esterhuysen, WEEKEND ARGUS Political Correspondent]

[Text] Big changes in conservation policy and new measures for environmental control are on the cards if the Cabinet accepts the findings of a major investigation now nearing completion.

The report of the probe, by a President's Council team, is scheduled to be debated in the council in September, after which it will be handed to President De Klerk for government consideration and possible action.

The investigation looked into an effective environmental management system for South Africa.

At open hearings of the investigating committee since early last year a wide range of environmental issues were dealt with and some drastic and far-reaching proposals were submitted by authoritative bodies and individual experts.

The issues range from control of tobacco smoking to car fumes, acid rain, soil erosion and major environmental pollution to the concept of environmental control through a single state department instead of a fragmented system.

It is the first PC inquiry in which all three specialist committees of the council—social, economic and constitutional—are involved.

President's Council chairman Dr. Willie van Niekerk told WEEKEND ARGUS this week that the recommendations, if accepted by the government, could result in a big change in the present system of environmental management.

Although he is not prepared to disclose any of the findings or recommendations at this stage, Dr. Van Niekerk made it clear the investigation covered such a wide spectrum of environmental affairs that the recommendations would be far-reaching in some respects.

Major facets covered by the investigation include: the present state of affairs, economic aspects of environmental control, legal aspects including recommendations for new legislation, and a management system for the environment.

Dr. Van Niekerk said that since the investigation began early last year, an "enormous" volume of oral and written evidence had been received by the investigating committee, including evidence from state departments, universities and from South African embassies abroad about the international environmental scene.

The recommendations will offer "practical, workable modus operandi" for environmental management.

Issues dealt with in evidence to the PC at open hearings included:

- The electrification of 20-million South African homes which do not have access to electricity—at a cost of R6 billion;
- A call from the botany department at the University of Stellenbosch for steps to prevent the "new South Africa" from becoming a man-made desert as had happened in some other African countries;
- The challenge of improving urban living standards at the end of this decade when 80 percent of the country's people are expected to live in city areas;
- The threat posed to South Africa's conservation effort by a lack of suitably qualified professionals in the State's service;
- A warning from a Rhodes University geography specialist, Dr. Alex Weaver, that South Africa's water is running out—he says water demand will outstrip supply by the year 2020;
- A proposal from the SA Chamber of Business (Sacob) that a single body be established to manage environmental matters;
- A proposal for the establishment of a national environmental research council to report directly to the State President;
- The effect of changes—mainly for the worse—in the state of the global environment;
- A recommendation from a member of the Medical Research Council that control of tobacco smoking be made a priority.

### Government Seeks To Market Nuclear Fuel for Civilian Uses

91AF1296Y Johannesburg THE WEEKLY MAIL  
in English 5-11 Jul 91 p 8

[Article by Eddie Koch: "Nuclear-Treaty Somersault Fuels Power Plan"]

[Text] Behind Pretoria's willingness to curb its nuclear-weapons industry is an aggressive plan to market nuclear fuel for civilian purposes.

South Africa's new-found willingness to sign the Non-Proliferation of Nuclear Weapons Treaty (NPT) will help curb Pretoria's nuclear-weapons industry, but signals an

aggressive government plan to market locally made nuclear fuel for civilian power stations on international markets.

President F. W. de Klerk's about-turn on the NPT last week—when he said South Africa was willing to sign it after years of resisting international pressure to do so—was designed to boost the country's ability to sell fuel rods for civilian nuclear-power stations, says Earthlife Africa nuclear expert Mike Kantey.

"The treaty prohibits trade in nuclear weapons and allows non-civilian nuclear installations to be monitored by officials of the NPT," says Kantey. "But it does not affect the civilian programme, and South Africa's signing will certainly help it to sell nuclear fuel on world markets."

De Klerk's announcement follows an official Atomic Energy Corporation (AEC) report late last year that it was seriously investigating the possibility of exporting nuclear fuel from its processing plant at Valindaba, where fuel rods for use at the Koeberg nuclear-power station near Cape Town are manufactured.

AEC chief executive Waldo Stumpf said then that although there was a downturn in international sales of enriched uranium, prospects for export were expected to increase from the second half of 1990, when nuclear-power generation was expected to increase around the world.

The AEC's news followed a report from the state-run corporation stating that it was capable of meeting all demand from Koeberg for fuel rods.

Until last year South Africa had relied on imported uranium fuel to power Koeberg's twin reactors—and the change-over reflected AEC's intention to enter the international nuclear market as an aggressive seller rather than purchaser.

"AEC invested more than R[ands]500-million to build its fuel-fabrication plant at Valindaba (near Pretoria) and the capital cost of the plant must have increased dramatically in the past decade," says Kantey.

"Ways have to be found for this to be paid back. There is a glut of uranium on world markets and a downturn in international sales of uranium since Chernobyl and the end of the Cold War. So AEC is in a pickle. It needs a marketing campaign—and that is what the signing of the NPT is about."

Energy specialist Marc Gandar told THE WEEKLY MAIL that AEC's stepped-up production of nuclear fuel indicates the government has committed itself to a full-blown nuclear programme for civilian purposes, and the environmental hazards that go with it.

Eskom [Electricity Supply Commission], which owns the Koeberg power station, last year announced it was planning to build a new nuclear-power station every five years, starting in 1995, as a means of supplying electricity to southern Africa.

Since then there have been talks with a number of neighbouring states about building large hydro-electric dams to supply the regional power grid and it is unclear if the nuclear scheme will go ahead.

But Kantey and Gandar point out that little attention is being paid to alternative forms of generating energy that have less-damaging environmental impacts.

Kantey notes that Pretoria allocates just one rand for the development of renewable energy for every R1,000 it spends on nuclear research.

Earthlife and the Natal-based Society Against Nuclear Energy (Sane) believe solar energy and wind-generated turbines can provide renewable and environment-friendly alternatives to the coal-fired stations that have turned parts of the eastern Transvaal into some of the most polluted zones on earth.

Foreign Minister Pik Botha denied the government's somersault on the NPT was motivated by a desire to accelerate the lifting of sanctions. He reiterated De Klerk's claim that the cabinet had decided to sign the NPT because the world order and the military situation in southern Africa had improved.

De Klerk and Botha said Pretoria agreed with the Organisation of African Unity's principle that the continent become a nuclear-free zone. Negotiations had already taken place with several Frontline states to create a nuclear-free zone in southern Africa, Botha added.

When Pretoria signs the NPT, it will have to open all aspects of its nuclear programme to inspection by members of the United Nations' international Atomic Energy Agency—including its uranium-enrichment facilities and fuel-fabrication plants at Valindaba and Pelindaba.

Kantey says the treaty will inhibit the ability to use enriched uranium developed at Valindaba or plutonium generated at Koeberg—both the vital elements of nuclear bombs—for military purposes.

"The treaty will impose an audit that will make it difficult to divert these fuels. But it's a very leaky treaty and will by no means guarantee nuclear weapons won't be made here.

"Recent experience in Iraq after the Gulf War has highlighted how easy it is to hide nuclear facilities for military use from monitoring officials."

## Regulations for Implementing Law on Air Pollution Control

91WN0546A Beijing ZHONGGUO HUANJING BAO  
[CHINA ENVIRONMENTAL NEWS] in Chinese  
28 May 91 p 2

[Article: "Detailed Regulations for Implementation of the Air Pollution Prevention Law of the People's Republic of China"]

[Text]

### Chapter One—General Provisions

Article 1: These rules of implementation are based on Article 40 of the Air Pollution Prevention Law of the People's Republic of China.

Article 2: The various levels of local people's governments should be responsible for the air quality in their regions of jurisdiction and should take measures to prevent air pollution and to protect and improve the air environment.

Article 3: The economic development departments of the people's governments at various levels should include air pollution prevention tasks in their production development plans according to the air pollution prevention requirements proposed by the people's governments of the same level.

Article 4: Enterprises that release pollutants into the atmosphere must include air pollution prevention work into their production development and technological improvement plans. The administrative departments of the enterprises should improve their management and monitoring of air pollution prevention efforts of the enterprises.

Article 5: The money, material, and equipment needed for air pollution prevention effort should be incorporated into the planning of the main body of the engineering project.

### Chapter Two—Monitoring and Management of Air Pollution Prevention

Article 6: Before the construction or utilization of a facility that releases pollutants into the atmosphere, its air pollution prevention equipment must be approved and its environmental impact report must be reviewed by the environmental protection department and found to satisfy the following requirements:

- (1) The effectiveness of the air pollution prevention facility must meet the design standard.
- (2) The rules and regulations of the air pollution prevention management must be complete.
- (3) Technological data on air pollution prevention must be complete.

A project may begin construction or utilization only after its air pollution prevention equipment is certified and approved.

Article 7: Units that release pollutants to the atmosphere should strengthen their management, periodic inspection

and repair of their air pollution prevention equipment in order to insure normal operation.

Article 8: Units that release pollutants to the atmosphere must submit "pollutant release declaration record form" to the local environmental protection department. For major changes in the type, amount and concentration of pollutants, a new form must be filed 15 days before such changes take place. For unanticipated major changes, a new form must be filed within three days of the change.

Article 9: When air pollution prevention equipment is to be dismantled or discontinued, an explanation must be filed with the local environmental protection department. The local environmental protection department should approve or deny within one month; failure to making a ruling within one month is to be taken as an approval.

Article 10: Polluting units given a time period to improve their pollution prevention should make periodic progress reports to the local environmental protection department.

The environmental protection department should review the progress, certify completed items and report the certified items to the people's government of the same level.

Article 11: Units responsible for atmosphere pollution incidents must make a preliminary report within 48 hours detailing the time, location, type and amount of pollutant, economic loss and personnel injury. After the investigation is completed, a detailed written report, with proving documentation, must be submitted to report the cause of the incident, the occurrence, the hazards, the actions taken, results of the actions, residual problems and future prevention.

Article 12: When inspectors of environmental protection departments and other monitoring and management departments conduct on-site inspection, the inspectors should display their inspection papers or wear identification badges. Such papers should bear the signature of environmental protection departments of the people's government higher than a provincial municipality.

Article 13: When the environmental protection department or other monitoring and management departments conduct on-site inspection, they may request the following information from the units under inspection:

- (1) to view the release of pollutants,
- (2) to view the operation and management of pollutant processing equipment,
- (3) model number, specification and calibration of pollutant monitor and equipment,
- (4) monitoring and analysis methods and records,
- (5) implementation of pollution improvement actions,
- (6) incident records,
- (7) production and material consumption data related to pollution,
- (8) other data and information related to air pollution.

### Chapter Three—Smoke and Dust Pollution Prevention

Article 14: Responsible department of the State Council should follow the national standards for smoke and dust emission from boilers and incorporate the permissible initial dust density and smoke darkness into the regulations of boiler quality.

Before a new boiler model design is finalized, the initial smoke and dust emission standards and measurement data should be filed at the environmental protection department in a people's government higher than provincial municipality.

Boiler manufacturers must indicate the boiler's initial emission standards on the name plate or in the instruction book.

The manufacturing, sale and import of boilers not meeting the aforementioned standards on dust density and smoke darkness are not permitted.

Article 15: Newly-built industrial furnaces or newly-installed boilers must obtain an inspection certificate from the environmental protection department before they are officially put into production or use. The manufacturing or use of furnaces and boilers that have failed to meet the national or local air pollution standards are forbidden.

Article 16: When new urban industrial zones or residential zones are developed or when old urban areas are remodelled, the supply of heat and electricity should be done simultaneously. For cases where the simultaneous supply of heat and electricity is not feasible, the supply of heat should be centralized. The design of heat/electricity supply or centralized heat supply should be done concurrently with the design of the construction project so that they may be built at the same time and be put in use at the same time.

Article 17: The responsible departments of the State Council and the various levels of local people's governments should promote the coal basket technology and low pollution burning technique in order to gradually phase out the burning of loose coal. The department responsible for fuel supply should make it a priority to provide the population with low pollution coal.

### Chapter Four—Prevention of gas, dust and smell pollutions

Article 18: New projects that would lead to the emission of poisonous gas or dust in residential area are forbidden. Projects not meeting the emission standards but already in existence or under construction should be cleaned up. Enterprise or business units causing severe atmospheric pollution should be ordered by the people's government to deal with the pollution problem in an allotted time period.

Article 19: Flammable gases such as coking gas, blast furnace gas, mine gas and synthetic ammonium should be recovered and sued. Units with the capability to recover the reusable gases but not currently practicing recovery should be ordered to do so by the environmental protection department of people's governments above the county

level with the approval of the people's government which has jurisdiction over the enterprise in question.

Article 20: Under special circumstances there may be a need to burn pitch, oil blanket, rubber, plastics, leather and other material that emit poisonous and offensive gases; such activity must be approved by the local environmental protection department and the burning must be done in a confined incinerator.

When pitch is melted for construction use, the melting must be done in an enclosed manner.

Article 21: When transporting, storing, loading or unloading materials that may emit poisonous gas or dust, relevant regulations must be followed and preventive measures such as enclosure, coverage, or spray are made.

Article 22: Motorized vehicles and ships are not allowed to release pollutants to the atmosphere beyond the standard level. Motorized vehicles and ships violating such standards will be dealt with.

Article 23: The environmental protection departments in the various level people's governments are responsible for the overall monitoring and management of motorized vehicles and ships emitting pollutants to the atmosphere.

Public safety, transportation, railroad, and fishing management departments are responsible for carrying out their respective duties in preventing and dealing with motorized vehicles and ships polluting the atmosphere.

Article 24: The production and maintenance departments of motorized vehicles and ships should incorporate pollution prevention into their business quality management.

The manufacturing, sale and import of motor vehicles that exceed the state's standards on pollutant emission are forbidden.

### Chapter Five—Legal Responsibilities

Article 25: The implementation of fines stipulated by Article 31 of the Atmosphere Pollution Prevention Law of the People's Republic of China will be as follows:

- (1) The fine for refusing to report or falsely reporting pollution emission incidents as required by the environmental protection department of the State Council will be no less than 300 yuan and not to exceed 3,000 yuan.
- (2) The fines for unauthorized removal or setting aside pollution prevention devices without the approval of the environmental protection department, and pollutant emission exceeding the standard level will be no less than 500 yuan and not to exceed 30,000 yuan.
- (3) The fines for refusing on-site inspection by environmental protection department or other monitoring and management departments, and for falsifying information during inspection, will be no less than 300 yuan and not to exceed 3,000 yuan.
- (4) The fines for unauthorized burning of pitch, oil blanket, rubber, plastics, leather, and other materials that



produce poisonous and offensive odors will be no less than 300 yuan and not to exceed 3,000 yuan.

(5) The fines for failure to pay fines assessed on pollutant emission will be more than 1,000 yuan and less than 10,000 yuan.

Article 26: The implementation of assessing fines stipulated by item 1, article 33 of the Atmosphere Pollution Prevention Law of the People's Republic of China will be as follows:

(1) If constructed facilities were put into production or usage before the completion of air pollution prevention system, the environmental protection department responsible for approving environmental impact report of the project may order the production to be stopped and may levy a fine of 5,000 to 50,000 yuan.

(2) When a construction project was put into production or usage before the air pollution prevention system had met the national requirements, the environmental protection department responsible for approving the environmental impact report of the project may order the production to be stopped and may levy a fine of 2,000 to 20,000 yuan.

Article 27: Based on item 1 of article 33 of the Atmosphere Pollution Prevention Law of the People's Republic of China, enterprise or business units may be fined 10,000 to 100,000 yuan for failing to deal with pollution problems after ordered to do so in a set period of time.

Article 28: The implementation of assessing fines stipulated by article 34 of the Atmosphere Pollution Prevention Law of the People's Republic of China will be as follows:

(1) Enterprise or business units causing atmospheric pollution incidents may be fined 10,000 to 50,000 yuan.

(2) Units that caused severe economic losses may be fined by an amount equal to 30 percent of the loss but not to exceed 200,000 yuan.

Article 29: Environmental protection departments in a county level government may assess fines up to 10,000 yuan. For fines greater than 10,000 yuan, approval should be obtained from the environmental protection department in the next higher government.

Environmental protection departments in a provincial municipality level government may assess fines up to 50,000 yuan. For fines greater than 50,000 yuan, approval should be obtained from the environmental protection department in the next higher government.

Environmental protection departments in provincial, autonomous region, and direct jurisdiction municipality governments may assess fines up to 200,000 yuan.

All the fines must be turned over to the State treasury, no units or individuals are allowed to intercept the fines.

Article 30: Units or individuals fined or warned for exceeding the pollutant levels are not released from the responsibility of cleaning up the pollution and paying for the damages.

#### Chapter Six—Addenda

Article 31: Departments in the State Council and people's governments in provinces, autonomous regions, and direct municipalities may draft implementation regulations based on the Atmosphere Pollution Prevention Law of the People's Republic of China and based these detailed regulations.

Article 32: The interpretation of these detailed regulations is the responsibility of the environmental protection department in the State Council.

Article 33: These regulations shall take effect on 1 July 1991.

#### New Refrigerant Found To Have Little Effect on Ozone Layer

91P60246 Beijing RENMIN RIBAO [OVERSEAS EDITION] in Chinese 4 Jul 91 p 1

[Article by Yao Jun [1202 6511], Zhang Jinsheng [1728 6930 0524]]

[Summary] A new refrigerant, developed by Chinese thermodynamicist Gu Chujun [7357 7176 6511] is said to have been proven to be the world's best refrigerant by the British Lothen Hampton NRC Refrigerator-Manufacturing Company, Ltd. The refrigerant, designated G2018, was found to have little effect on the ozone layer or greenhouse phenomenon, and has the highest refrigeration efficacy in the world. According to NRC's report, the refrigerant's ozone layer destruction coefficient is less than 0.03, and its contribution to the greenhouse effect was less than that from F134a and F22, two of the world's best-known refrigerants. The refrigerant G2018, along with a refrigeration cycling system, has been used in making household refrigerators and window air conditioners in China, and electricity savings of 33 percent and 14 percent have been obtained respectively. The first Chinese-made energy-efficient window air conditioner was made in March 1991. The 31-year-old Gu Chujun has established a company called "Huazhao [5478 3564]" group, which is now a transnational corporation with branch offices in Hong Kong and Britain. So far, 600 supermarkets from Britain have ordered the installation of the 'Gu Chujun' refrigerant system.

#### Book Examines Environmental Management Policies

OW0608132091 Beijing XINHUA in English  
1201 GMT 6 Aug 91

[Text] Beijing, August 6 (XINHUA)—China's environment has not been deteriorating over the past decade despite the fact that the speed of economic growth doubled, according to Qu Geping, director of the State Environmental Protection Bureau of China.

"The discharge of most pollutants has been kept at a stable level, and the environmental quality in some cities and the ecological condition in some regions has even been

improved," Qu writes in his newly-published book: "Environmental Management in China".

He goes on: "Considering China's present economic capacity, it is not easy at all to make these achievements. This proves that the policies and measures we have pursued have been correct."

Qu says that China has not neglected its environmental problems or implemented the wrong policy of "control after pollution" in the course of modernization, but rather adopted active prevention and control measures.

"As the modernization program is still going on in China, environmental protection has a long and tough way to go," he notes. "The vast territory, huge population, rapid economic development and problems left over by history have made the environmental situation serious."

The 333-page book, which is based essentially on Qu's personal experience as one of the leading environmentalists in China, was jointly published by the United Nations Environmental Program (UNEP) and China Environmental Science Press.

Commenting on the book, Mostafa Tolba, executive director of UNEP said that the author has made a positive first step toward an improved environment for China. "I have no doubt that this book will be a real addition to our knowledge and understanding of the issue of proper environmental management," he said.

### **Government To Allocate Funds for East China Water Conservancy Projects**

*HK1508091591 Hong Kong TA KUNG PAO in Chinese 11 Aug 91 p 2*

["Special dispatch:" "Yang Zhenhuai, Minister of Water Resources, Discloses Central Government Will Allocate 5 Billion Yuan for Huai He and Tai Hu Water Conservancy Projects"]

[Text] Beijing, 10 Aug (TA KUNG PAO)—When meeting a Hong Kong and Macao relief delegation this morning, Yang Zhenhuai, minister of water resources, disclosed that the government had decided to allocate 5 billion yuan over five years for water conservancy projects in east China, 3 billion yuan for the Huai He area, and 2 billion yuan for the Tai Hu area.

Yang Zhenhuai briefed the delegation on this year's flooding, combat against floods, the cause of flooding, the importance of water conservancy projects in controlling floods, as well as present and future work. He made these remarks when referring to harnessing the Huai He.

Yang Zhenhuai said water conservancy projects built for the last 30 years had played a very important role. This includes projects for draining and containing floods and diverting floods through the Dapu He.

Although the third flood peak has passed without causing danger, another flood peak is likely to appear at the end of August or early September; therefore, a fourth struggle against floods will be imminent, he said.

He indicated that because the Huai He area is located where southern warm weather and northern cold weather mix, northern cold weather will slowly move southward between late August and early September, thus pressing hot weather down to the south. This will possibly give rise to rainstorms and a fourth flood peak.

This year's flooding is very serious despite water conservancy projects built for the last 40 years. Yang Zhenhuai pointed out that the main cause was excessive rainfall, which made drainage difficult. The Huai He dike can be used to prevent one-time flooding in 40 years, but canals and ditches on the plains inside the dike area in Anhui Province can only be used to drain a one-time rainstorm in three or five years. The dike section in Jiangsu Province can only be used to drain a one-time rainstorm in 10 years. This year's rainfall has broken all records in the last 30 years. Rainfall in some areas including Changzhou and Huangshan has broken records in the last 100 years, far exceeding the drainage capacity of canals and ditches in these areas. This was the cause of flooding. Over 80 percent of the current flooding in the Huai He and Tai Hu areas was caused by water logging resulting from rainstorms.

### **Prominence Will Be Given to Construction of Water Conservancy Projects During Eighth Five-Year Plan; Construction of Urban Flood Control Projects Will Be Strengthened**

Water conservancy departments should from now on step up their efforts to build and repair water conservancy and irrigation projects and to harness big rivers and lakes including the Huai He and the Tai Hu, he stressed.

He added that China is a country where flooding and drought frequently occur. Half of the country's population and major cities is situated below the flood levels of rivers, and the industrial output value of regions threatened by floods accounts for two-thirds of the country's total. The central government has pointed out time and again that floods caused by the Chang Jiang and the Huang He always constitute a serious danger to the Chinese people. Floods have caused increasing losses because the population along rivers is increasing and the economy is developing. The current flooding indicates that irrigation is a basic industry involving economic and social development and that harnessing rivers is a major issue involving the tranquility of the country and the people.

The party and the government will make major efforts to harness big rivers and lakes during the Eighth Five-Year Plan.

First, a way out should be found for Tai Hu flooding within three years, and harnessing work for the Huai He should be completed in five or ten years. Efforts to harness the Chang Jiang, the Huang He, and other big rivers will continue to be stepped up. In the near future the State Council will hold a meeting on harnessing the Huai He and the Tai Hu. At this meeting a plan will be worked out and submitted to the National People's Congress, which will make a decision on harnessing the river and the lake.

Second, urban and rural people will be organized in an all-out effort to build water conservancy and irrigation projects during this winter and next spring. Water conservancy and irrigation facilities have been in bad repair these few years. We should sum up this lesson and make up our minds to increase investments in the construction of these projects. The masses will be organized for the construction of these projects. This job will serve as a form of relief for them.

Third, state investment in capital construction projects will be oriented to flood control and drainage. Investments in the construction of irrigation facilities will be increased. In harnessing rivers, priority should be given to projects for comprehensive utilization. Hydropower stations with comprehensive efficiency should be given priority arrangements.

Fourth, major efforts should be made for the construction of urban flood control projects. In future construction, we will give full consideration to the construction of flood control projects along rivers, in mountainous towns, and when selecting sites for factories, mines, and enterprises. In river and lake management, we will carry out the "Water Resources Law," "River Channel Management Regulations," and "Flood Control Regulations," resolutely remove river obstacles; and strictly prohibit the enclosure of tidelands for cultivation. Enclosure of tidelands must be dismantled to ensure the normal outflow of floods.

In the past 30-odd years since the 1950's, no big flooding had been noticed in China's rivers, Yang Zhenhuai pointed out. Will the weather in the 1990's shift to a rainy period? This is really worrying. He mentioned repeatedly the need to make long-term arrangements for harnessing major rivers.

In conclusion, Yang Zhenhuai expressed his thanks to Hong Kong and Macao compatriots for their concern; this concern serves as powerful support for flood victims in their combat against floods and rebuilding their homelands. He also hoped that the Hong Kong delegation would convey his sincere thanks to the people in various circles in Hong Kong and Macao.

### Conference Highlights Need for Greater Efforts Against Urban Pollution

*HK1608043991 Beijing CHINA DAILY in English  
16 Aug 91 p 1*

[By staff reporter Zhai Feng; "More Efforts Needed for Clean Cities"]

[Text] Jilin, Jilin Province—Despite achievements in the drive against urban pollution during the past five years, the nation will have to make greater efforts to keep its cities clean, a national conference on the urban environment was told yesterday.

"Urban environmental protection will remain high on the policy-makers' agenda in the coming years," said Premier Li Peng in a letter to the second national urban environmental protection conference, which opened yesterday.

Qu Geping, head of the State Environmental Protection Bureau, said at the conference that the government has put forward a programme for controlling urban pollution for the Eighth Five-Year Plan (1991-95).

By 1995, according to the programme, 70 percent of the country's industrial waste water will be disposed of, 74 percent of its industrial emissions will be treated and 35 percent of industrial solid waste will be recycled.

And Qu predicted that by 1995, urban green space will be increased to 24.2 percent of the total land area in cities.

Qu also told the conference that the nation has successfully controlled the discharge of industrial sewage to a maximum of 24.9 billion tons per year during the last five years.

"But the nation cannot be over-optimistic about the current situation, because an average of 15 million tons of sulphur dioxide is still being emitted into the air in this country each year," qu warned. Consequently, acid rain has hit South China, causing grain output to decline by about 10 percent, he said.

More than 90 percent of untreated domestic sewage is directly discharged into rivers and lakes, and only 1.2 percent is processed each year.

## REGIONAL AFFAIRS

### Japan Submits Plan To Solve Asia-Pacific Environmental Problems

*OW1508010291 Tokyo THE DAILY YOMIURI in English 14 Aug 91 p 2*

[Text] An investigation on air pollution in China is just one of the new strategies presented by the Environment Agency Tuesday in an effort to find solutions for environmental problems in developing Asia-Pacific nations.

The 10-year strategy, which begins in fiscal 1992, is called the Eco-Asia 21 Plans and consists of 21 concrete projects, such as giving aid to establish environmental preservation plans, preparing a monitoring system in contaminated areas, protecting wild animals and providing technology transfer information.

In the past, Japanese official development assistance projects have been criticized for being carried out under separate ministries, because it resulted in each institution taking responsibility for loans, grants and technical cooperation.

The Eco-Asia 21 Plans will harmonize the projects to alleviate the fragmentation. Under the plan in fiscal 1992, environmental officials from international institutions such as U.N. Environment Program, World Bank and Asian Development Bank will be invited by the Japanese government in fiscal 1993 to study assistance programs for the Asian countries.

Next year will be the first meeting of the Pan-Japan Sea Environment Cooperation Conference, which will discuss preservation of the contaminated Japan Sea with other island countries. Other strategies include help for Indonesia's contaminated water and Thailand's traffic-related pollution.

## JAPAN

### Environment Agency To Survey Underground Water Sources for Carcinogens

*OW0308041491 Tokyo KYODO in English 0335 GMT 3 Aug 91*

[Text] Tokyo, August 3 KYODO—The Environment Agency said Saturday it plans to survey underground water sources throughout Japan to determine the level of possible carcinogenic chemicals.

The agency is concerned about concentrations of diethylhexyl phthalate (DOP), a type of phthalic ester shown to cause cancer in laboratory animals in the United States.

DOP is widely used in Japan to make vinyl chloride products because it adds flexibility, but United States Government studies indicating it is carcinogenic have ignited concern here about its presence in the environment and its affect on health.

The U.S. Environment Protection Agency is said to be considering a strict limit on DOP of four parts per billion (4 ppb) in drinking water.

The Japanese Health and Welfare Ministry also has decided to revise guidelines on the quality of water to include a stricter permitted level of DOP, which is suspected of causing kidney and liver damage.

The agency's survey will look at underground water supplies in a number of locations with the help of local authorities and try to determine the density of DOP in the water.

U.S. investigators have discovered concentrations as high as 5.8 parts per million (5.8 ppm) in the underground water near waste burial sites. Japanese environment officials suspect their own survey may uncover similar dangerous concentrations.

Japanese industry produces about 30 tons of DOP annually to make a variety of vinyl chloride products for household and agricultural use, and bags and tubes for medical purposes.

Surveys in 1975 discovered growing concentrations of DOP in samples of water and rice.

Some reports then said a leading source of DOP was from toys made of vinyl that melted, leading some officials to warn that it could become a second PCB or polychlorinated biphenyl, a widespread and highly toxic compound.

An agency survey then, however, did not reveal a high enough concentration of DOP to be considered dangerous, so the agency left it unregulated.

In 1982, another agency survey found concentrations of 18 ppb in some places and noted higher concentrations in the mud along rivers, but a nationwide survey was never done.

Phthalate ester is suspected in the deaths of some U.S. servicemen during the Vietnam war who received blood transfusions and later died after showing symptoms of shock. It was suggested the chemical, which dissolves relatively easily, may have been in blood that had been stored in vinyl bags.

### Plutonium Utilization Program Questioned

*OW1308144091 Tokyo ASAHI EVENING NEWS in English 12 Aug 91 p 8*

[Editorial: "Plutonium in Light, in Shadows"]

[Text] Fifty years have passed since fissionable Plutonium 239 was first artificially produced in a U.S. laboratory. More than any other known element, plutonium has the power to keep the entire world on edge. Amid such concerns, Japan is about to initiate a full-pledged program to harness atomic energy using plutonium.

Leading the research team which produced the element, Dr. Glenn Seaborg wrote that this element has two basic characteristics: one being benevolent, with its promise of wealth with the peaceful utilization of nuclear energy; and

the other malevolent, with its threat to the very survival of the human race through its application to nuclear weapons.

We now know from history that humankind became familiar with the malevolent characteristic of plutonium before learning of its benevolent uses. The atomic bomb which exploded in the sky above Nagasaki City 46 years ago was made with about 13 kilograms of plutonium. Since that time, more than 200 tons of plutonium have been stored at arsenals around the world.

The use of plutonium as nuclear fuel has suffered the fate of laboring in the ominous shadow of the image of nuclear weaponry. The mere three grams of Plutonium 239, which Iraq separated with its experimental reactor, has unsettled the international community because of its implications of possible nuclear proliferation.

Japan's plutonium utilization program was announced early this month. In a report, the nuclear fuel recycle special task force of the Atomic Energy Commission projected that the domestic demand for plutonium would reach 80 to 90 tons by the year 2010. The figure shows that the demand will grow ever larger for non-military purposes.

Because of a scarcity of uranium resources, Japan has adopted a nuclear energy policy of recycling the leftover plutonium created in the reactor process. Recycling is done with the help of France and England commissioned by Japan for the extraction of plutonium from the spent fuel. Japan is also planning to build a commercial-use reprocessing plant at Rokkasho Village in Aomori Prefecture.

Despite the progress in Japan's efforts to secure a greater supply of plutonium, the development of a fast breeder reactor operating on plutonium is making little progress. To cope with the situation, authorities decided on a "pluthermal" plan to use plutonium derived from the reprocessing of nuclear waste as fuel for the existing light-water power reactors, starting in the mid-1990s.

Japan's attempt to make public its energy programs using plutonium should help to dispel unnecessary suspicions about the country's intentions. But, the latest plan gives the impression that the supply came first, and the demand was created to match it. Such a situation is believed to have resulted from adherence to a conventional nuclear fuel cycling policy.

There is no need to rush the use of plutonium for the time being. Instead, efforts should be made to re-evaluate the scale and turnaround time of recycling, taking into account demands due to changing circumstances. Emphasis should be placed on research efforts to focus nuclear energy systems, including the treatment of radioactive waste, on peaceful uses.

To this end, the report made a noteworthy proposal. It introduced a method of recycling not only plutonium but also the element, transuranium. What was needed to make an atomic bomb is only highly enriched plutonium, and the reprocessing method currently in use is based on such

military technology. With this method, transuranium, which has a long decay rate, is retained, making the treatment of nuclear waste more difficult.

Transuranium can be used as fuel. If it can be extracted and put back into the fuel cycle together with plutonium, it will not only facilitate the effective use of resources but also help reduce the burden of nuclear waste treatment. Such a program, however, requires a change in the reprocessing formulas and the development of new fast breeder reactors. Nevertheless, it would help to eliminate the ominous shadow of the nuclear threat image of plutonium.

"The emphatic use of plutonium as nuclear fuel would also help to prevent nuclear proliferation," said the report. Yet, the world remains wary of plutonium. Tight control systems are indispensable for its transportation and storage. Calls are mounting for a nuclear material control system based on an international perspective. A thorny path lies ahead before we can truly benefit from this man-made radioactive element.

#### **Sony Plans To End Chlorofluorocarbon Use by 1995**

*OW1908012791 Tokyo KYODO in English 2309 GMT  
18 Aug 91*

[Text] Tokyo, Aug. 19 (KYODO)—Sony Corporation plans to move up the end of use of ozone-destroying chemicals such as some chlorine compounds in all production processes by two years to the end of 1995, an industrial daily said Monday.

NIKKAN KOGYO SHIMBUN said the electronic firm uses some types of chlorofluorocarbons in aerosols and packaging.

An international agreement calls for termination of use of such chlorine compounds by 2005.

The ozone layer, which acts as protection against harmful effects of the sun's radiation, is destroyed by reaction with nitric oxide and chlorine compounds.

## **LAOS**

#### **Forest Conservation Policy Outlined**

*91WN0565A Bangkok DAO SIAM in Thai 26 May 91  
p 3*

[Article by Thai Farmers' Bank Specialists]

[Excerpts] [passage omitted] It is felt that Laos has the most abundant forests in the world. It has a forested area of about 70 million rai [a rai equals about 0.4 of an acre] which is 47 percent of the total area of the country. The forested area is primarily in the central region and the South.

The forests are a natural resource which is very important for the Lao economy because wood is a good which has always earned substantial hard currency for Laos. The income from wood exports provides about 40 percent of all

export income. The important export markets for Lao wood and wood products are Thailand, Taiwan, Japan and South Korea. [passage omitted]

At present, the forested area of Laos is being reduced at the alarming rate of about 1.25 million rai per year. If the destruction of Lao forests maintains this pace, there will be only 38.75 million rai of forest left in the year 2000 or 26 percent of the total area of Laos. This would be close to percentage of forested area in Thailand now, which is about 28 percent.

The causes of this rapid destruction of Lao forest can be summarized as follows:

1. **Shifting agriculture.** There are 253,000 Lao families living in the mountains and plains who still farm the traditional way by cutting and burning the forest in order to prepare or enlarge fields for agriculture. After these fields have been cultivated for two to three seasons, they are abandoned, and more forest is cleared. There is about 1.88 million rai of such agricultural land. This shifting agriculture is the primary cause of forest destruction - about 625,000 rai per year.

2. **Cutting timber for export.** The demand for foreign exchange and foreign consumer goods has caused Laos to increase its wood exports rapidly in the last two to three years. The quantity of wood cut has been at the high level of around 350,000 to 450,000 cubic meters per year. Of this about 30 to 40 percent is exported. In addition wood is illegally cut for export. In the South it is estimated that 100,000 to 150,000 cubic meters of illegal wood are exported per year.

3. **Forest fires.** These occur in the dry season and are caused both by the burning of fields and forests to prepare for cultivation of crops and by natural causes.

The Lao Government is very concerned about the problem of forest destruction and has demanded that the forests be protected. It has forbidden that wood be cut for export and has ended its reliance on income from the wood trade. Lao officials have set up a forest conservation service, and there are projects to plant more trees in order to increase the forested area so that by the year 2000 it will equal the forested area of 1950 which was 106.25 million rai or 70 percent of the country. This area will be divided into a conservation area of 59.38 million rai, a wild animal reserve of 15.63 million rai and a commercial forest area of 31.25 million rai which the people could exploit.

These projects to conserve and bring back the forests will require a great deal of money. The project to conserve the forests, the Tropical Forest Action Plan or TFAP, will require U.S.\$230 million. Of this U.S.\$120 million would be used to end shifting agriculture. Because Laos is poor and lacks these investment funds, it will have to request foreign assistance for forest conservation. At present there are some reforestation projects; these have received assistance from the United Nations Development Program (UNDP) and the European Community (EC). But it is still

doubtful that Laos will be able to conserve much of its forests because it will have to rely on foreign assistance which is generally limited.

In addition future projects to build giant dams will be serious obstacles to Lao forest conservation because dam construction destroys a great deal of forest. For example the Pha Mong 210 dam has a reservoir which covers 609 square km or 380,625 rai. The Nam Thoen 2 dam has a reservoir which covers 156,250 rai, which might be doubled in the future. In addition to these two dams the Lao Government has projects to build many other large dams. These projects were generally developed by the Mekong Basin Development Commission of the United Nations, such as the project for the Nam Ngum 2 Dam.

When the Lao Government adopted the policy of preserving the forests, it had an effect on Thai merchants involved in the timber trade with Laos inasmuch as the Lao Government raised the export duty on wood many times. The Lao policy on wood exports has not been clear. Starting around the end of 1988 the Lao Government prohibited the export of many types of wood. Then Lao officials rescinded this order at the beginning of 1989 but raised the export duties and permitted only processed wood to be exported. Since then the Lao Government has raised the export duties many times. These high export duties have caused Thailand to reduce wood imports from Laos, and this has affected the income of Laos. As a result Laos has raised or lowered the export duty or the price of the exported wood regularly to maintain its export income.

Whether the Lao policy of conserving its forests is successful or not will depend on foreign assistance funds. In addition Lao economic development policies will have to be in agreement with the forest conservation projects because Laos still needs a great deal of hard currency to develop the country and it has only one way to get large amounts of hard currency: by exchanging Lao natural resources for hard currency. At present it has only wood and electric power from hydroelectric dams to earn large amounts of money, but these two exports both affect Lao forests.

The policy to develop the Lao economy by building dams to make money from electric power generation, and the necessity of cutting and processing wood for export income may mean that the project to conserve and bring back the Lao forests will not reach its goal: the forested area will not increase to 70 percent of the total area of the country from the present 47 percent by the year 2000. At present the Lao Government is standing at a crossroads. Whatever it decides it should decide on the basis of the best interests of the country.

## MALAYSIA

### Government Rejects Foreign Environmentalists' Allegations on Logging

*BK0608073691 Kuala Lumpur Voice of Malaysia  
in English 0600 GMT 5 Aug 91*

[Text] The Sarawak government is not unduly concerned by the bad publicity generated by foreign environmentalists over its logging activities because most of it is untrue.

Chief Minister Tan Sri Haji Abdul Taib Mahmud said 90 percent of the allegations made by the environmentalists about the logging and Penan issues were not true.

The government considered the issues raised by environmentalists as only a passing phase in the development of the state. Tan Sri Taib was launching a book, "A Dream of Freedom—the Early Sarawak Chinese," by a local author Dr. Paul M.H. Yong in Kuching, the state capital of Sarawak.

Tan Sri Taib said the state had done a lot to help the Penans and the government did not need a re-thinking by others about how to run the state. His main concern now is the future of the state, particularly the roles of its people in playing a part in development in line with the national objective to make Malaysia a developed country by the year 2020.

### Prime Minister Scores Rio-92 Conference

*BK1608092691 Kuala Lumpur BERNAMA in English  
0705 GMT 16 Aug 91*

[Text] Kuala Lumpur, Aug 16 (OANA-BERNAMA)—Prime Minister Dr. Mahathir Mohamed indicated Friday that Malaysia will not attend the earth summit in Brazil next year.

He said that if the international environmental movements had already decided to oust Malaysia from the world, "There is no longer a need for us to attend."

"If this is their intention, it is therefore not a conference to seek a solution to environmental problems. We all know that our environment is polluted by the industrialised nations, not by Malaysia.

"But they insist on this for political mileage," he told reporters here.

He was referring to a report which states that Malaysia has been chosen as the first target of international hatred and hysteria. According to the report, this is because Malaysia is a small, isolated and a more vulnerable country.

Dr. Mahathir said that if the international conference on environment was to be staged to suppress the weaker third world countries, it would be better for these countries to organise their own conference.

By having such a conference, they would be able to be enlightened on the actual situation, he said.

"If we were to go there just to have them hurl abuse at us, there is no point in us attending," he added.

The prime minister believed that these groups were being funded by certain economic lobbyists to create problems with the intention of destroying the nation's economy so that the people would remain poor and their people prosperous.

"This is what they want...They do not wish to see Malaysians having a good life," he added.

He said that "if they were to see us living in peace and prosperity, they will do whatever they can to create chaos."

Dr. Mahathir said that Malaysia would, with a sense of responsibility, explain the situation if it felt necessary to do so but "if they merely wish to declare 'war,' what can we do."

The prime minister said that the problem of the Penans, a tribe found in the East Malaysian state of Sarawak, was only a new approach devised by them to suppress the smaller nations.

They had always wanted to dominate the country but since they could not do so politically, they would indirectly resort to whatever means to colonise countries like Malaysia which had already seen some development and is bold enough to speak out, he added.

He said that they wish to see the Penans displayed as exhibits in museums so that they would be able to come and gawk at the remnants of the cave-men and as jungle people that did not require care and supervision.

He said that the aborigines in Australia and the Red Indians in the United States were now left behind unlike the Penans and they want the Penans to be treated the same way.

The prime minister said that the government intends to see to it that the Penans enjoy the same benefits as other Malaysians.

Dr. Mahathir said that Malaysia could do nothing against the groups which had tarnished the country's image.

He said that Malaysia was told by countries where these groups originate that they did not have the power to prevent their action.

"We are told that their governments are fair, only that these people are not, but the effect on us is the same," he said.

## MONGOLIA

### Increase in Hunting of Wildlife Reported

*OW1208133391 Ulaanbaatar MONTSAME in English  
to BAKHTAR Kabul 1233 GMT 12 Aug 91*

[Text] Ulaanbaatar, August 12. (OANA-MONTSAME)—As is well known, Mongolia is rich in wild animals and species of rare fauna. This is why Mongolia attracts hunters from all parts of the world. Every year about 300 hunters come to our country and they pay almost 2 million dollars for this pleasure. However, this year over 600 hunters have come to Mongolia and paid 2.5 million dollars. They took with them such trophies as 70 mountain ram horns. They have shot 550 deer, 15 elks, three snow leopards, 85 antelopes, etc. Although Mongolia is rich in different flora and fauna and receives dollars for hunting, this runs contrary to the problem of protecting wildlife.

## TAIWAN

### Government Seeks Support on Stalled Kungliao Nuclear Power Plant Project

OW0808094791 Taipei CNA in English 0830 GMT  
8 Aug 91

[Text] Taipei, Aug. 8 (CNA)—The Ministry of Economic Affairs will seek a breakthrough in a long-stalled construction project in the country—a fourth nuclear power plant, a ranking ministry official said Thursday.

Construction on the proposed nuclear power plant in Kungliao, Taipei County by the state-run Taiwan Power Company has long been delayed by strong opposition from environmentalists and residents near the proposed site.

With the upgrading of pollution control technology, the official said, Taipower can effectively minimize damage to the environment in the plant's nearby areas.

The ministry will strengthen communications with residents in the vicinity of the proposed plant to win their support for the important energy development project, the official said.

## THAILAND

### Japan To Initiate Antipollution Aid Plan

BK1408070391 Bangkok THE NATION in English  
14 Aug 91 pp A1, A2

[Text] Japan has chosen Thailand as the "model country" to launch its new policy initiative to combat worsening industrial pollutions in developing countries, Japanese officials said yesterday.

They said the initiative, known as the "green aid plan" will be formally unveiled by Eiichi Nakao, Minister of International Trade and Industry (MITI), during his visit here this week.

Nakao, who is scheduled to arrive here tomorrow, will discuss the plan with Prime Minister Anan Panyarachun and other senior Thai officials.

The green aid plan is a package of comprehensive and integrated pollution prevention and control in the industrial sector, which will be designed jointly by the two governments to cure the environmental ills of Thailand.

Negotiations are now underway between the two governments as to whether and to what extent the Japanese government will provide financial assistance to encourage local industries, including wholly-Thai-owned companies and joint ventures, to adopt better environmental standards, said Toshio Nakamura, MITI's director of Economic Cooperation Division.

He declined to comment how much financially the Japanese Government has planned for the programme in Thailand, but said some forms of incentives should be formulated to mobilize support from the private sector.

"Pollution prevention is usually a low priority for industries. We need some sort of incentives to encourage them to raise environmental standards," Nakamura said in an interview with THE NATION yesterday. He is part of the advance team of the MITI minister's delegation.

Although the green fund may be administered by the Overseas Economic Cooperation Fund (OECF) of the Japanese Government, Nakamura said the green aid will be an addition to the bilateral overseas development assistance (ODA) Thailand receives annually from Tokyo in the forms of grant aid, soft loans and technical assistance.

According to Shuji Kato, a representative for the Asia Pacific Region of the Japan Overseas Development Corp, which is a semi-government organization responsible for channelling Japanese assistance to the Thai private sector, Tokyo has set aside US\$15 billion for the five-year ODA programme ending 1992. The focus of the ordinary aid programme is also environment-oriented.

Nakamura will fly to Singapore today to brief the minister on the response of the Thai officials concerning the green aid proposal before Nakao visits Bangkok, the last stop of his Asia-Pacific tour which also takes him to Australia, Singapore and Thailand.

A senior Thai Government official, who works with Japanese officials on Tokyo's new aid plan, said the Thai government was formally informed about the plan just recently.

During Japanese Prime Minister Toshiki Kaifu's visit to Bangkok in May, Deputy Prime Minister Sano Unakun told the Japanese premier that Thailand was seriously working to tackle the environmental degradation in the country and asked if Japan could render help in this area.

The proposal drew strong support from the Japanese side, which led to the creation of the green aid plan, he added.

Japan has indicated that it wanted to get confirmation of support for the proposal from Prime Minister Anan first before proceeding with detailed work, noted the Thai official.

Details of the programme would have to be worked out after Prime Minister Anan gives assurances to MITI Minister Nakao when they meet on Friday at Government House, he said.

Thailand has been selected as the first recipient country of the green aid programme because of its strong political support to tackle the problems, public awareness and the severity of pollution in the country, according to officials. Currently, Japan is the biggest foreign investor in Thailand.

"The public awareness of the pollution problem in Thailand is exceptionally high," said Kato.

Under this plan, both sides will establish a channel for policy dialogue so that they can work together to identify environmental problems which need to be resolved



urgently. They will also formulate the basic strategies to cope with the problems, Nakamura added.

He expected the first policy dialogue to be held before the end of the year so that action programmes can be implemented at the beginning of Japan's next fiscal year starting April.

Based on the policy dialogue, Japan will transfer technology required to restore Thailand's environment which has been damaged as a result of rapid industrialization in the country, he added.

Moreover, joint research and development activities in regards to pollution prevention and control will be carried out together, Nakamura said.

The Bangkok office of Japan External Trade Relations Organization (JETRO) will coordinate with the Thai Government and the private sector which wanted to make requests for technical and financial assistance from the Japanese Government.

Japan has faced strong criticism internationally about its environment policies. The attack has mounted pressure on Tokyo to come up with new initiatives in this area.

#### **Japanese Aid Prompts New Look at Environmental Initiatives**

*BK1708044091 Bangkok THE NATION in English  
17 Aug 91 p A8*

[Editorial: "Help Ourselves While Accepting 'Green Aid'"]

[Text] To Japanese Prime Minister Toshiki Kaifu, the much-talked about new world order must include sound environmental protection so that people everywhere can live safely and in dignity to enjoy peace, prosperity, freedom, human rights and democracy.

As part of Tokyo's policy to play a larger global role commensurate with its enormous wealth and economic influence, Japan will actively help developing countries tackle environmental problems and reconcile development and environmental protection.

This is a welcome policy initiative which all other rich, developed countries should emulate.

Japan's Ministry of International Trade and Industry (MITI) has chosen Thailand as a "model country" to launch the Japanese "green aid plan." A team of MITI officials, led by Minister Eiichi Nakao, is in Bangkok this week to meet with Prime Minister Anan Panyarachun and other ministers. The two sides will jointly design programmes to help Thailand tackle industrial pollution problems and formulate pollution control measures to protect the environment.

#### **Ideal Choice**

Thailand is an ideal choice for several reasons: Japanese investment constitutes about 60 percent of all the foreign investment in this country; Japan is the single largest trading partner of Thailand; Japanese cars and trucks,

imported or assembled locally by Japanese-Thai joint venture firms, form a large majority of all the vehicles on Thai roads; and last year 650,000 Japanese visited Thailand, accounting for about 12.5 percent of all the tourists coming here.

Thailand's double-digit rate of economic growth in recent years, fueled partly by Japanese investment and Thai exports to Japan, has continued to aggravate environmental degradation. Water pollution, air pollution and illegal dumping of industrial wastes have worsened in many industrial areas.

In recent years, public awareness of the multitude of environmental problems in Thailand has been increasing. And Prime Minister Anan Panyarachun correctly pointed out the other day that the credit for raising the awareness must go to conservation groups and other nongovernmental organizations that have monitored the environmental degradation and sounded the alarm.

Past governments did take note of the worsening situation and politicians in power gave a great deal of lip service to environmental problems. But not much else was done. Most of the politicians had close connections with big businesses who were in many cases the shameless culprits.

Only during the Chatchai administration did it dawn on the Thai officialdom that most of the existing laws for environmental protection and pollution control were too disorganized and scattered. Still worse they were hardly enforced by the police and administrative authorities. Even the National Environmental Board [NEB] was virtually powerless to see to it that all the policies it helped to formulate were properly carried out and polluters promptly punished.

Politicians, NEB officials and economic development planners began to talk about establishing a ministry of environment to gather all the agencies dealing with the environment in the new bureaucratic body. The idea has gained momentum in the Anan administration but so far it is still far from coming to fruition, because Prime Minister Anan has a policy to limit the growth of the bloated bureaucracy.

#### **Responsibility**

Before Thailand gleefully accepts the Japanese "green aid," the Anan administration must first demonstrate political will to enforce all the existing environmental protection laws and punish all violators without fear or favour. Japan can only provide us with money and technology, train Thai personnel in environmental protection and pollution control, build waste treatment plants, etc. But it is Thailand's responsibility to stop and punish polluters and prevent new violations.

The Anan administration must show that Thailand is ready and capable of handling this responsibility.

Thailand must help itself first otherwise the valuable Japanese "green aid" will come to naught.

## VIETNAM

### **Government Approves Desalination Program in Ca Mau Peninsula**

*BK1808142891 Hanoi VNA in English 1416 GMT  
18 Aug 91*

[Text] Hanoi VNA August 18—A program of desalination for Ca Mau peninsula which covers about 1.66 million hectares in the southernmost region of the country has received the go-ahead from the government and concerned agencies.

The program aims to stabilise cultivation in the entire region, help extend the cultivable area and pave the way for multiple cropping and intensive farming in combination with the protection and restoration of forests and the prevention of soil and coastal land erosion.

The program divides the region into eight areas, the largest covering 417,500 hectares and the smallest, 41,800 hectares. Each area will have its own irrigation system.

A desalination project has been drawn up for the coastland central areas as a basis for other projects for the whole region. The project, to be completed in five years, includes the construction of seven of the 11 planned sluices. New canals will be built and existing ones will be dredged to bring water from the Mekong River to the centre of the peninsula where will be installed a conservancy network comprising ditches and small pumping stations. Work will be carried in stages, in the direction of the sea, so that desalination can be completed in one area before it is extended to the next.

The Ministry of Water Resources is responsible for the whole program while the government will fund the main constructions. The local authorities and population are to contribute to the construction of smaller facilities.

## REGIONAL AFFAIRS

### Japan To Offer Antipollution Expertise to East Europe

*OW1308163191 Tokyo ASAHI EVENING NEWS in English 12 Aug 91 p 5*

[Text] Japan plans to hold a symposium in Berlin in November on Eastern Europe's pollution problems, offering its knowledge of advanced antipollution measures, according to Foreign Ministry sources.

The government plans to send pollution researchers and administrators involved in environmental issues to speak on Japan's antipollution technologies and policies.

Expected to be invited to speak and attend the symposium are academics, business leaders and government officials from Germany and East European nations, according to the sources.

Although details of the symposium were not available, the sources said the government is in the process of selecting the speakers to be sent to Berlin.

They added that the government has planned the symposium with the aim of offering technology Japan has accumulated as a nation with a long history of dealing with pollution.

The Japanese government prides itself on the country's technology and policies on environmental protection, developed from the 1960s while fighting some of the world's worst cases of industrial pollution.

### Host to Congress

Last month Japan's Environment Agency was host to the Environment Congress for Asia and the Pacific and shared with developing nations in the region Japan's experience in fighting pollution.

Japanese representatives said that antipollution measures, though expensive, may be cheaper than paying compensation to victims of pollution-related diseases—a lesson Japan learned over the years it built up its industries and economy at the cost of the environment and people's health.

Delegations from Japanese industries, government and academia toured Eastern Europe in 1989 to survey the state of pollution there and to plan what cleanup and preventive measures would be needed.

A recent report compiled by a government study group on global environment stressed the need for Japan to provide technological assistance and administrative knowledge in energy conservation measures to the Soviet Union, Eastern Europe and other developing nations in an attempt to curb increasing carbon dioxide emissions. Some scientists have said excessive carbon dioxide in the atmosphere is leading to global warming.

### Controversy Continues Over Gabcikovo Dam Project on Danube

#### Ongoing Eurochain Protest

*AU0608142891 Prague CTK in English 1601 GMT 3 Aug 91*

[Text] Samorin, South Slovakia, Aug 3 (CTK)—Several hundred people from Czechoslovakia, Hungary, and Austria protested at Samorin-Cilistova in South Slovakia today against continued work on the controversial Gabcikovo water project on the Danube.

A Eurochain blockade, which attempts to stop the filling of a reservoir on Slovak territory, started precisely one month ago.

Jaromir Sibl of the Slovak Union of Environmentalists told the demonstrators about his meeting with Slovak Premier Jan Carnogursky on August 1 who informed him that the Slovak Government is resolved to continue work at Gabcikovo. Eurochain and environmental organizations will therefore continue to organize peaceful demonstrations, Sibl said.

Several dozen demonstrators occupied a vessel which is pumping water to the new reservoir.

#### Hungarian Environmentalists Appeal to Czechoslovak President

*AU0708100991 Budapest MTI in English 1302 GMT 5 Aug 91*

[Text] Budapest, 5 August (MTI)—In a move to protect the natural resources of the Danube and protest against the completion of the Gabcikovo Hydro-Electric Dam System, the Danube Circle, a group of Hungarian environmentalists, have addressed an open letter to Vaclav Havel, president of the Czech and Slovak Federal Republic. The letter was handed over at the Czechoslovak Embassy in Budapest on Monday.

In the letter, the Danube Circle expresses concern at the fact that the constructors, now at the end of their tether, are forcibly suppressing the activities of the citizens living beside the river Danube. The letter reminds Havel that, before being elected as president, he supported the Hungarian Government's decision to suspend the project. For this reason, the circle considers it has every reason to expect the president to do all he can to ensure that the police of the democratic Czech and Slovak Federal Republic is not deployed against environmentally-aware and concerned citizens, and that the natural resources of the Danube are protected.

#### Czechoslovak Environment Minister Seeks Further Negotiations

*AU0908085691*

[Editorial Report] Bratislava NARODNA OBRODA in Slovak on 6 August and Bratislava PRAVDA in Slovak on 7 August both publish interviews with Minister Josef Vavrousek, chairman of the Federal Committee for the

Environment, on the construction of the Danube dam at Gabčíkovo. In both interviews, Vavroušek expresses reservations about government policy on the project.

Bratislava NARODNA OBRODA in Slovak on 6 August on page 3 carries a 1,300-word interview with Josef Vavroušek by Alena Waleková entitled: "A Variant for Everyone! Does It Exist?" The place and date of the interview are not given. In the interview, Vavroušek reiterates his position that the so-called "C" variant, providing for the completion of the project on the Slovak side, is "unacceptable" for him and that the only possibility is to hold further negotiations between Czechoslovakia and Hungary and to seek a compromise. In this connection he criticizes the positions of both sides. He says: "I have always regarded the position the Czechoslovak side has been officially upholding until 15 July, that is, the insistence that the original solution be implemented, as incorrect. However, I also regard as incorrect the position of the Hungarian side, which proposes suspending all work on the project and canceling the treaty, to be followed by discussions on some partial agreements.

"This would result in a state of legal vacuum as the cancellation of the treaty would leave us with no background material for further negotiations. Besides, suspending all work is impossible for various reasons, primarily ecological ones. The project's construction has already led to heavy environmental damage, 90 percent of which, perhaps even 95 percent, is on Czechoslovak territory. Some 40 square kms of the most fertile soil in our country have been totally destroyed. This means that the Hungarian position is very one-sided and selfish, as it were, because it does not respect the fact that our territory has already been damaged while the damage on the Hungarian side is negligible."

Vavroušek goes on to say that, because the damage cannot be undone, there is no point in returning to the past but that the further course of action must be based on the status quo. Now it is necessary to overcome the "deadlock" in negotiations, which Vavroušek regards as "dangerous from the ecological, political, as well as economic viewpoints," and to seek the "least evil solution" that would be "acceptable to both sides, including the local population." In this context Vavroušek points out that the local population has never been asked about its opinion on the project and deplors that "the unwillingness to conduct a dialogue continues."

Asked what such a bilaterally acceptable solution might look like, Vavroušek says: "To put it briefly, the philosophy of the operation of the entire project must change. The original plans provided for all [Danube] water passing through the power station. According to the new philosophy, one should mainly attend to what the surrounding areas need and only what remains would be allowed to pass through the barrage."

The minister agrees with the project's critics that it is an "expression of megalomania." He points out, however, that the decision can no longer be reversed (according to Vavroušek, it could be reversed until 1981) and that

restoring the landscape to its original condition would be virtually impossible—because of the vast amounts of asphalt and concrete that would have to be disposed of but also because the 40 square kms of fertile top soil are irreversibly lost. He therefore reiterates that "the only solution is finding a way of completing the project that would be acceptable to all sides."

In the interview, Vavroušek acknowledges that he disagrees with the government's stand on the issue. The relevant passage reads: "In the Federal Government a relatively pessimistic view prevails regarding the prospects of negotiations with the Hungarian side, which is why the variant of a temporary solution was originally asserted, which I personally consider to be very bad, from both the technical and ecological viewpoints, because it would endanger underground water reservoirs. I also consider this solution to be absolutely unfeasible from the international viewpoint because it would mean diverting [the flow of] an international river to the territory of our state. Let me cite just one technical detail that matters—the canal will absorb a maximum of five cubic meters of water per second but as many as 12 to 13 cubic meters flow through the Danube at times. This excess water would thus have to be discharged through the original river bed. It is scarcely conceivable that the Hungarians would accept it if we sent them a flood from time to time."

Asked about the filling of the derivation canal, work on which started on 27 July, Vavroušek says that the Federal Government "had not been informed" about this step. He adds: "I understand that, from the technical viewpoint, an empty canal deteriorates; I hope that the canal's filling is not the start of the implementation of the 'C' variant."

Bratislava PRAVDA in Slovak on 7 August on page 2 carries a 600-word interview with Josef Vavroušek by Lubo Rabay entitled: "Agreement Is the Way Out." The interview was conducted in Cilistovo on 6 August, where Vavroušek met with representatives of the "Eurochain" civic initiative, which is organizing a blockade of the Gabčíkovo building site. Vavroušek reiterates his opposition to the "C" variant, "the sole advantage of which is that it can be implemented solely on our territory, without agreement with Hungary." He believes that "the question whether this advantage outweighs the variant's disadvantages has not been satisfactorily answered to this day," which, in Vavroušek's opinion, also explains the protests against it. This is also why the minister calls it a "simplification" when "the activity of the civic initiatives is described as the cause of the conflict."

Vavroušek goes on to say that the "tension" which the controversial project brought about "between states and various groups of the population" can be eliminated only through negotiations, which presupposes "the readiness to discuss all possible variants that can be considered and not to treat any one of them as sacrosanct."

In conclusion, Vavroušek is asked to respond to the "rumor that is making the rounds in Slovakia" that the Czech and Federal Governments do not want Gabčíkovo to generate electricity because it would "substitute for

energy supplies from Bohemia and weaken Slovakia's dependence on the Prague center." Vavrousek replies that a Czech politician wishing that electricity generation in already devastated North Bohemia be sustained at current levels would have to be "a suicide or a madman."

### 'Friends of the Earth' Urges Havel To Halt Project

*AU1208094691 Budapest MTI in English 1735 GMT  
7 Aug 91*

[Text] Budapest, 7 August (MTI)—The American section of the international environmental protection organization "Friends of the Earth" has addressed an open letter to President Vaclav Havel of Czechoslovakia, asking him to press for an immediate halt in the construction of the Gabčíkovo hydroelectric dam system.

Repumping the water of the Danube into the service channel constitutes a violation of international law. Friends of the Earth supports the stand of environmentalists protesting against putting the pumping station into operation, runs the letter, which has also been forwarded to MTI.

The organization has asked the Czechoslovak president to use his prestige to ensure the safety of the protesters.

According to the organization, workers building the plant are not threatened by unemployment. Moreover, American experiences indicate that restoring the environment provides jobs, and this also applies to the Gabčíkovo dam, where it would take years to eliminate the damage caused to date.

### Slovak Ministry Rejects Hungarian Campaign Against Project

*AU1208131491 Prague CTK in English 1455 GMT  
9 Aug 91*

[Text] Bratislava Aug 9 (CTK)—The Slovak Ministry of International Relations today expressed serious concern over a campaign against the Danube hydroelectric project at Gabčíkovo and in support of demonstrations against it which it said has been under way in Hungary for over a month.

In a statement made available at a press conference today the ministry says information on the project is one-sided, leaving no space for expert opinion. Demonstrators are being encouraged to use the pressure of certain international organizations against their legitimate government, the statement says.

Slovak Minister of International Relations Pavol Demes said the agreement signed with Hungary in 1977 is valid in the context of international law. Any attacks against the Slovak side that it breaks the rules thus have no ground.

Demes said the demand to return 40 square kms of built-up area which is lost for agriculture is not feasible.

### Slovak Greens Announce Support for Dam Completion

*AU1608153091 Prague CTK in English 1252 GMT  
13 Aug 91*

[Text] Bratislava AUG 13 (CTK)—The Slovak Greens Party today came out in favor of completing the Gabčíkovo dam on the Danube, provided the 19 conditions established by the Slovak Environmental Commission (SEC) are adhered to.

Greens Chairman Peter Sabo told a press conference the commission had compiled a list of measures intended to minimize the ecological damage resulting from completion of the hydroelectric project. The commission's first priority in drawing up the list was to preserve the Gabčíkovo region's natural potential, Sabo said. Arguments based purely on economic considerations or energy supply took a back seat.

Members of the SEC at the press conference cited a lack of evidence that the completed dam would cause an irreversible environmental catastrophe. But the Slovak Union of Guardians of Nature (SSOPK) argued that building the dam and putting it into operation will have harmful effects on forests, water, farming, hunting and fishing in the area.

The SSOPK denied claims that only Hungarians living in Slovakia oppose the project, or that the environmentalist opposition was started by Hungary alone.

If construction is stopped immediately, it will still be possible over the next five to ten years to recultivate the areas that have already been damaged, the SSOPK said.

## BULGARIA

### Nation's Environmental Needs Outlined in Report for Rio-92 Conference

*AU1608143791 Sofia BTA in English 1410 GMT  
16 Aug 91*

[Text] Sofia, August 16 (BTA)—"The funds allocated for environmental protection accounted for no more than 1.7 percent of Bulgaria's gross domestic product. Moreover, the allocations were made on the so-called 'residual principle,'" it is said in a report of the Centre for Environmental Monitoring with the Ministry of the Environment. The report, which will be presented at the UN Conference on Environment and Development due to be held in Brazil in 1992, was made public at a press conference today by Mr. Tsonyu Mikhaylov, director of the centre.

In the 1975-1990 period metallurgy, coal mining and the power industry generated more than 2 billion tons of solid waste. Bulgaria needs 2.5 billion dollars to solve this problem, Mr. Mikhaylov said. According to the report, some 50 million dollars per year will be needed to repair the damage done by using the polluted waters of the Danube river to irrigate 200,000 hectares of land. Air pollution is dangerous to birds of passage. Bulgaria needs about 1 billion dollars to clean up its air.

Mr. Venko Beshkov, deputy minister of the environment, said he hoped that in the future the United Nations would divide the countries into three instead of two groups: developed, developing and countries undergoing a period of marketization. This suggestion stems from the fact that the East European countries share some common concerns, Mr. Beshkov said.

The report reviews the geographical characteristics of the country, its population and natural resources. It also sets forth Bulgaria's environmental policy which is in line with the process of structural readjustment of the Bulgarian economy. It is stressed in the report that the definition of a long-term economic, social, political and environmental policy will make it easier to bring life to normal and to solve the specific problems of the Balkan countries, Mr. Gancho Ganchev, an official of the Ministry of Foreign Affairs, said.

## CZECHOSLOVAKIA

### Bohemia Parties Issue Joint Ecological Demands

*LD0808185191 Prague Ceskoslovensky Rozhlas Radio Network in Czech d1600 GMT 8 Aug 91*

[Text] Representatives of seven political parties and movements, as well as representatives of towns and villages in northwest Bohemia, adopted a five-point statement at the end of their deliberations in Teplice.

The statement demands that a power industry and consumption concept and any environmental protection concept be discussed and adopted by 30 September. It also demands that considerable and effective legislative measures and a comprehensive plan on improving the environment of the region be adopted. They also demand local retention of all money from fines for polluting the environment and that privatization of enterprises is carried out so that a direct link is established between producers, employees and communities.

Representatives of the Czechoslovak People's Party, Czechoslovak Social Democracy, Movement for Self-Administered Democracy Society for Moravia and Silesia, Farmers' Movement (Hnuti Zemedelcu), Czechoslovak Socialist Party, Green Party and the agrarian party also expressed disapproval of the notion that it is necessary to work to get money to spend on ecological issues. They pointed out that it will be impossible to base any economy on land which is dead.

### Tisova Power Plant To Dismantle Second Block

*AU1308132791 Prague CTK in English 1341 GMT 11 Aug 91*

[Text] Prague Aug 11 (CTK)—By the end of this year, a second 100-megawatt block will be removed from operation at the Tisova electric plant in Sokolovska, about 150 kms west of Prague, Plant Manager Miroslav Frank told CTK today.

Frank said that besides reducing atmospheric warming and unhealthy smoke emissions in northwest Bohemia, dismantling the block will contribute to a cleaner environment in the neighboring German states of Bavaria and Saxony.

The Tisova power plant became the first in Czechoslovakia to lay off one of its blocks with the shutdown of a 100-megawatt unit in December 1990.

## HUNGARY

### Regional Environmental Pollution Detailed

*AU0708095991*

[Editorial Report] Budapest MAGYAR HIRLAP in Hungarian on 1 August on page 5 carries a 1,100-word unattributed report on environmental pollution in Hungary's various counties, under the headline: "The Factory Only Stops Polluting When It Stops Working."

With the help of its regional correspondents, MAGYAR HIRLAP has compiled "an environmental pollution map" for some of Hungary's counties. MAGYAR HIRLAP reports that "in Kalocsa, on the former site of a Soviet helicopter air base that was abandoned in 1990, the 'water sample' taken around the site of the fuel cisterns proved to be 95 percent kerosene." Incidentally, MAGYAR HIRLAP notes that "abandoned Soviet barracks are causing a new kind of environmental problem." For example, "the soil under Veszprem is completely soaked in oil and gasoline." Consequently, the people in Veszprem County say that "the air might be clean, but there might not be many people left to enjoy it in the future."

MAGYAR HIRLAP notes that "in Baranya, it is the mines that cause the greatest pollution." The article points out that "the new business partners who are showing a serious interest" in the region "do not want to assume responsibility for the neutralization of the environmental damage caused over the last few decades." Therefore, the costs will "inevitably burden the state budget," sooner or later.

The MAGYAR HIRLAP report points out that "Somogy can be seen as an industry-free county." The authorities have succeeded in solving a "threatening problem" caused by specialized pig farms "around Lake Balaton." The situation is not as encouraging in Vas County, according to MAGYAR HIRLAP. From the point of view of public health, "the water in the Raba river has been declared fourth rate."

The article notes that in Southern Alföld, "the air is incomparably cleaner than in Hungary's five notorious rust belts." MAGYAR HIRLAP also points out that "it is primarily the eastern/south-eastern part of Bekes County that has been affected by ground pollution caused by chemicals used in agriculture."

Finally, MAGYAR HIRLAP reports that "in Szabolcs-Szatmar-Bereg County, there are no critical areas" because "there is only a small number of industrial plants."

### Survey on Environmental Damage Left by Soviet Army

AU0708133191 Budapest MAGYAR HIRLAP  
in Hungarian 1 Aug 91 p 5

["H.A."-signed report: "Tokol: We Can Only Guess the Size of the Environmental Damage"]

[Text] Budapest's water supply is in danger. Several members of our government, led by Prime Minister Jozsef Antall, visited the former Soviet air base at Tokol a week ago. News got around that our capital's water supply was in danger due to the large-scale environmental pollution. We asked the people who investigated the matter about the exact level of the danger.

At first, we asked Istvan Endredy, who directed the national survey on environmental damages caused by the Soviets, why the results of the survey had to be made secret.

In his opinion, the data was not made secret although Ministerial Commissioner Gabor Szabo, deputy state secretary, prohibited their publication. This was necessary so as to have an adequate negotiating position, because the Soviets are very sensitive to all reports in our mass media. The Environmental Inspectorates are obliged to give the survey results to the affected local governments and to other entrepreneurs and institutions that are to use these installations, on the basis of guidelines laid down by the ministerial commissioner.

The Company for Survey and Soil Analysis [FTV], led by Office Manager Zsolt Sajgo, carried out the assessment of environmental damage in the area of Tokol airport. We asked him about the level of direct danger threatening Budapest's water supply. According to his explanation, the level of threat to the wells and water table always depends on the actual water-level of the Danube and the amount of rainfall. The main direction of water-flow is toward the Danube, that is into the wells, but the direction changes toward the middle of the [Csepel] island at a higher than medium or a high water-level. Therefore, we can only

estimate the time when the water-holding layers in the ground and the wells will become polluted. This could happen in five to 10 years in the case of the waterworks at Halasztelek. Pollution will appear much sooner, within five years, in the area that has been earmarked for the future water supply of Budapest. The situation could become dangerous within 50 years at the Tokol wells. Istvan Stefan, an FTV employee, announced that 3,000 cubic meters of hydro carbon pollution can be found in this area. Some 1,740 cubic meters of that is in the form of liquid kerosene on the surface of the water table. Approximately 1,000-1,500 cubic meters can be extracted by using the wells, but the polluted soil will also have to be cleaned. The polluted soil amounts to 700,000 cubic meters. Extraction through the wells is the cheapest solution and according to preliminary figures, it would cost 60-70 million forints. The removal of pollution from soil granules can be done by biological methods or by ventilation [kilegeztes]. Some 62,000 cubic meters of communal waste mixed with dangerous waste was detected in one area of the airport, and 80-85 thousand cubic meters of the same was detected in another area. The removal of all the contamination might take as long as one year.

We learned from the experts that foreign companies would examine the pollution processes at the Northern part of the Csepel island in a one-and-a-half year long PHARE [Economic Reconstruction Aid for Poland and Hungary] program.

Nationally, the FTV surveyed the environmental damage caused in 32 installations. They found the most severe damage at the airports in Sarmellek, Tokol, and Kunmadaras. They found serious contamination at Petfurdo, where a fuel base operated since the 1960's. Some 80 percent of this 30-acre area is mainly polluted with gasoline. The carbohydrate pollution endangers inhabited areas at the so-called Huszar army post, which is in the area of the West-Transdanubian Environmental Protection Inspectorate. Heavy metal contamination many times over the permissible limit was detected at the firing range in Vati, not far from a drinking-water spring.

## REGIONAL AFFAIRS

### Argentine-Chilean Cooperation on Volcano Damage Urged

PY1808224091 Buenos Aires BUENOS AIRES  
HERALD in English 17 Aug 91 p 10

[Editorial: "Ashes Which Bind"]

[Text] Relations with neighbouring Chile are again the matter of heated debate for at least the second time this month. While the eruption of Mount Hudson can hardly be blamed on our neighbors, it still affects the future of a vast area in both countries. Like most acts of Nature the eruption of Mount Hudson was on nobody's cards but threatens to have imponderable effects on the environment on both sides of the Andes—in this connection, it is perhaps paradoxical that while normally there is more attention paid to a pin dropping in the Federal Capital than the most momentous developments in Patagonia, on this occasion an environmental disaster down south has created more of a stir than the daily environmental damage going on under our noses in Greater Buenos Aires.

While it is all very well that politicians of both countries should find time for protracted geopolitical feuds, a more realistic dialogue, such as the one pursued by President Carlos Menem with his trans-Andean counterpart Patricio Aylwin during the latter's recent visit here, has now become an unavoidable must. In the short term mutually acceptable policies must be found to deal with the aftermath of the Mount Hudson eruption and in the longer term to guarantee the future bilateral policy takes due account of the fact that, despite the myriad of excuses brandished by extremist nationalists in both countries, Chile and Argentina are next-door neighbours sharing a common mountain range and thus inextricably linked by a past history and a common future. As we have been told ad nauseum over the Laguna del Desierto dispute, both countries are "divided" by the Andes. As Mount Hudson has rather rudely reminded everyone, this "division" is in fact capable of producing a shared threat, in this case a major Nature-produced environmental disaster which urgently calls for joint action, and could equally produce shared benefits.

At a time when Argentina, Brazil, Uruguay and Paraguay are implementing the MERCOSUR [Common Market of the South] free trade zone, it is incomprehensible why closer links with Chile are not also being sought as a matter of priority. Chile is not only one of the major economic success stories of Latin America but arguably the country which has most effectively expanded its international trade both into traditional and nontraditional markets. As such, it offers Argentina a unique opportunity to seek a rapid but permanent settlement of existing differences so as to be able to concentrate on the unique opportunities of a 5,000 km common border. Paradoxically it is the widespread damage produced by the eruption of Mount Hudson which offers both countries a unique opportunity to do something jointly, free from any political, geographical or

historical considerations, as a step in the direction of further initiatives leading towards closer integration.

## BAHAMAS

### Government, IDB Sign Nonconventional Energy Study Agreement

FL1008013991 Bridgetown CANA in English  
2203 GMT 9 Aug 91

[Text] Nassau, Bahamas, Aug 9, CANA—The Bahamas Government and the Inter-American Development Bank (IDB) on Friday signed a technical cooperation agreement to finance a study of nonconventional energy supply. The agreement was signed by Finance Minister Paul Adderly and IDB President Enrique Iglesias, who is visiting the Bahamas for the first time since he was elected to that post in April 1988.

The cost of the studies to be undertaken under the agreement is U.S. 740,000 dollars, of which the IDB is providing 680,000 dollars. The financing is being derived from the net income of the fund for special operations of the IDB. The remaining 60,000 dollars is to be provided by the Bahamas Government as counterpart financing.

The Ministry of Consumer Affairs and the Bahamas Electricity Corporation will be the executing agencies for the national solar water-heating programme and the wood-burning power plants electricity supply studies. The Department of Lands and Surveys of the Ministry of Works and Lands will be the executing agency for forestry studies. The period for execution of the programme is 30 months from the date of the agreement. On completion of the studies, the IDB will consider financing the feasible consequential investments.

The primary purpose of the programme is to assist the country in reducing its dependence on imported fossil fuels. The study will analyse the technical and economical feasibility of solar water heaters and small wood-burning power plants. The study will also examine their environmental impact and prepare the framework for legislation on forestry regeneration, use and development, as well as the design of generating equipment for optimal delivery of electricity to consumers.

## BRAZIL

### Rio-92 Report Cites Major Environmental Destruction in Cities

91WN0621A Sao Paulo VEJA in Portuguese 10 Jul 91  
pp 60-65

[Text] The visage with which Brazil will appear before the world during "Rio 92," the United Nations Conference on Environment and Development to be hosted by Rio de Janeiro next June, also known as "Echo 92," is already taking a definite shape. It will have features very similar to those of the 160-page official report to be released this week by Cima, the interministerial commission in charge



of preparations for the conference. From what one can read in the document, a very elaborate report produced with contributions from some of Brazil's most prominent researchers, the country will shock international public opinion.

Anyone expecting a sentimental document, filled with claims of love for nature and appeals to save capuchin monkeys and lions from cynical people, and to save the blue macaws, will be disappointed. What the Brazilian scientists did in this report was to condemn, primarily, the type of development in Third World countries, which has generated focal points of wealth separated from poverty, and turned the major cities into megalopolises with people crammed like canned sardines in gas chambers. The report stresses that Brazil is one of the countries showing the greatest distortion in this respect, citing the visible but little perceived fact that the destruction of the environment is occurring far more in Brazil's large cities than in the jungles.

To be sure, it contains suggestions on how to maintain the integrity of the Amazon Forest, through incentives for tourism and extractive activities, and how to free the Mato Grosso Lowlands from predatory hunting and the pollution of its streams by alcohol plants. It discusses democratization of the relations with Indians. The emphasis, unusual in documents of this type, was nevertheless placed on the everyday suffocation of the vast majority of Brazilians: those who coexist with the problems of the large metropolises. The 70 specialists invited by the foreign affairs minister, Francisco Rezek, who chairs the Cima, to contribute by preparing the report, avoided the easy temptation to mythicize mother nature. They had the wisdom to identify the ecological requirements (to combat attacks on the environment that are harming human health and security), separating them from the environmental boast of saving some plant or animal even at the cost of social damage and paralysis of the economy.

#### Space-Ship 'Earth'

Maria Tereza Jorge Padua, head of the Pro-Nature Foundation (Funatura), a respected independent ecological entity, remarks: "We have at hand a diagnosis that is the result of the best that Brazilian intelligence in the environmental field could produce." Starting this week, over 40,000 copies of the document will be distributed among universities and environmental studies centers; and another 20,000 copies will be published in the "Official Journal of the Union." The Cima technicians hope that the document will be discussed and that, by 31 July, it will be possible to extract a more compact final version from it, to be submitted to the United Nations.

Silvia Campiglia, director of University of Sao Paulo (USP) Institute of Biosciences, complains: "There is no more time for suggestions from research institutes, universities, or government organizations." There are grounds for the complaint when one realizes that other countries participating in the conference have already completed their reports. But Cima's preliminary diagnosis is so refined that few expect it to undergo changes capable of

distorting its main features. Sociologist Paulo de Gois Filho, general coordinator of the study, claims: "Based on the quantity and quality of the ecological information compiled alone, the report is now the most complete ever produced in the country at any time."

The study recaptures the metaphor of space-ship "earth," used by the American astronomer, Carl Sagan, to illustrate the fact that the planet's resources are finite. "Eighty percent of the passengers on the space-ship are in the cargo compartment, comprising Third World countries in which over a third of the inhabitants are suffering from famine, and three quarters lack adequate access to water or decent housing," states the report. The description of such a situation would suffice to make it clear that the ecological objectives of the developed countries (whose residents travel first class) are different from those sought by the poor nations.

#### Expansion of Cities

According to the Cima study, by the year 2000 six of the world's 12 most heavily populated cities (megalopolises with over 13 million inhabitants) will be located in Latin America. This means that, if the concentrating trend is not reversed, four out of every 10 Latin Americans will be "urbanoids" crowded in a capital where even the air will be of the worst quality. Without drastic changes in the development models, the report warns, poverty will be the condition determining life in 37 percent of the households on the continent, while another 17 percent of households will be in an destitute predicament.

Neli Aparecida de Mello, director of the department for incentives to research at the Brazilian Institute of the Environment, Ibama, comments: "For Brazil, environmental protection is, more than anything else, the right to, and protection of life. The society has evolved from one ecological movement to another of a preservationist type, and now it has arrived at the movement for the preservation of life itself." In the case of Brazil, it is in the large cities that the benefits of a type of development that is more harmonious and less devastating for natural resources may be experienced.

Even in the Amazon Region, the major problem of human coexistence with nature is the accumulation of people in towns, without the slightest infrastructure for accommodating their residents. The report gives a reminder that 61 percent of the Amazon Region's inhabitants are living in poverty-stricken urban regions without drainage systems. In the metropolises farther to the south living conditions are less aggressive, but irrationality has been the mark of their development. Two thirds of Brazilians are currently residing in nine large urban zones: Sao Paulo, Rio de Janeiro, Belo Horizonte, Porto Alegre, Salvador, Recife, Fortaleza, Brasilia, and Belem. In those localities only 8 percent of the trips taken by people daily from their homes to work, and vice versa, are made in subways or on electric trains, which are nonpolluting.

The report states: "The prevalent highway transportation occupies space, and has caused most of the atmospheric

pollution from which Brazil's large cities are suffering." Add to this the fact that only 3 percent of urban waste in Brazil is suitably treated, and you realize why the Cima document stresses that ecology should go where the people are. The expansion of cities has continued to the point where, according to the report, it is not enough to give an incentive for family planning. The document maintains that the improvements to be achieved in the population-versus-environment equation are so urgently needed that other causes must also be attacked: the methods of using resources.

### Green GDP

The anthropocentric notion of nature, based on the concept that ecological assets must be preserved for human benefit, is good in any latitude, but it is far more precious in the poor countries. In the Northern Hemisphere the society is being urged every day to make decisions wherein there is no way of making a mythical adoration of nature compatible with the real world. In the United States, for example, there is much debate on the preservation of a certain type of owl that exists only in Oregon. To save it from extinction, the American ecologists are calling for the deactivation of dozens of lumber companies, which would put 30,000 persons out of work. What is worth more: an owl or 30,000 employees? A rich country can afford to opt for the owl and absorb the unemployed lumberjacks in other industries. Brazil, with its legion of unemployed and under-employed, many of whom are beset by the specter of hunger, if confronted with a dilemma of this type, would certainly have more difficulty in defending the owl to the detriment of 30,000 families.

The Brazilian ecological report avoids treading paths leading to that kind of dilemma, for which there will always be an audience, and concerning which ardent defenders on both sides will take a position. However, the document goes to the heart of the matter, from the Brazilian standpoint. It calls for the adoption of a type of development in the country that will no longer put humans in a hostile position toward nature because of the spurious necessity of seeking progress at any cost. It calls for a new type of development, in which natural capital has a cost: just as a barrel of oil, a car, or a liter of milk have a price today. On this point the Cima technicians' diagnosis is in agreement with the most advanced treatments of the ecological problem in the entire world.

At the World Bank, the financial organization that is the main source of government funds for the Third World, there is currently a debate on the adoption of what the economists call the "Green GDP," which would represent a new accounting of the wealth of nations. This accounting considers not only the ecological capital of a country, but also the manner in which it is used. Herman Daly, a World Bank economist, explains: "The Green GDP takes into account the fact that forests are capital, just like oceans and fish, which we have been wasting. The atmosphere's capacity to absorb waste is a kind of natural capital, and we are treating it abusively."

### Without Blackmail

Based on that new accounting, a polluted industrial town like Cubatao, in Sao Paulo, faced with alarming indexes of atmospheric poisoning last week, would be an enormous furnace in which capital is being burned, rather than a focal point generating wealth (see following chart). Ronaldo Seroa da Motta, a researcher from the Applied Economic Research Institute (IPEA) in Rio de Janeiro, observes: "That rate of reduction could be applied in any country. In the United States, during the 1960's and 1970's, the average annual growth in the GDP was 2.6 percent. If reduced by the costs of pollution, that rate would drop to two percent."

Environmentalist Paulo Nogueira Neto, direct advisor to the secretary general for "Rio 92," the Canadian Maurice Strong, claims: "The report is the admission ticket to the game. As in a poker game, no one wants to show his cards before the round begins." It is feared that the contents of the report may be viewed as Third World blackmail against the rich nation's coffers, or at least as a trade-off such as this: "You want us to preserve the Amazon Region? Well, that has a cost, and you are the ones who will have to pay." Nothing of the sort. The report, while simultaneously rejecting the proposals for internationalizing the Amazon Region, claims that the country is equipped to take care of its forests and animals, although it may possibly need foreign financial aid to undertake specific projects for environmental preservation.

Neli, from Ibama, notes: "We aren't engaged in a process of blackmail, as Africa and Asia have been. We are seeking partners with whom we can carry out a joint endeavor." According to the researcher, at the most recent meetings on the environment, African and Asian bloc countries made it clear that they will protect the environment only through First World investments. "We don't want to obtain money for basic cleanups. We are striving for a greater world awareness of the scope of the environmental problems," asserts Neli. But almost no one in Brazil conceals the fact that they hope to see the world awareness become condensed into a rain of funds for Third World countries interested in resuming growth on healthier ecological bases, and even in cleaning the dirt already created.

Representatives from many countries on the planet involved in organizing "Rio 92" have been forming task forces to prepare treaties vital to the Third World's ambitions. They are following the model of the treaty drawn up in Vienna, Austria, during 1985, calling for the gradual reduction of CFC (the chlorofluorocarbon gas blamed for the hole in the ozone layer) production, and its abolishment by the year 2000. The treaty was ratified by the Brazilian National Congress in March of last year. Some of the treaties of direct concern to Brazilians during "Rio 92" are:

**Biodiversity Treaty:** Establishing standards to protect biological diversity on earth, guaranteeing its genetic breeding stock of both flora and fauna. The current rate of devastation is making species extinct even before humans can study them. As a result of this, mankind could be losing

genuine treasures. For example, 25 percent of cures have been discovered from studies of medicinal plants. According to the treaty, the countries in which such plants are native would receive royalties on the marketing of industrialized medications. This would realistically encourage preservation and study of biodiversity, making forest clearing not only an attack against nature, but also economic stupidity.

**Treaty on Tropical Forests:** Stipulating compulsory use of the concept of development supported by the exploitation of tropical forests throughout the world. In other words, progress cannot kill the jungle.

**Treaty on Science and Technology:** A set of measures to encourage exchange of technologies. It is aimed primarily at transferring advanced and less polluting technologies to the developing countries, so as to reduce the environmental destruction caused by their development process.

**Environment Foundation:** Calls for the creation of an international fund to give an incentive for environmental rehabilitation and preservation projects. There is not yet consensus on how the resources for the fund are to be attracted. The Brazilian Government's proposal is for a \$1.00 tax per barrel of oil.

These are all treaties demonstrating that "Rio 92" will view ecology as an extension of the economy. For Brazilians suffocating in the large cities because of the problems of an economy that grew perversely, it will not fail to be a real hope.

#### What the Green GDP Is

An example of an impracticable project based on the new ecological view of progress is the petrochemical enclave in Cubatao, Sao Paulo. The government invested in its recovery, but last Wednesday it again showed pollution rates exceeding tolerable levels, forcing the ordering of a state of emergency and the total shutdown of its industries for 24 hours. The damage from the assault against nature (due to the shutdown that day alone) amounted to \$3.8 million. Cubatao is a by-product of anti-ecological development. The extremely poor quality of life for residents there is connected with an industrial park producing wealth under environmentally unacceptable conditions.

The Brazilian report for "Rio 92" is aimed against the type of development that predominated in the country throughout the history of its industrialization, accusing it of creating islands of wealth amid a sea of misery, as in Cubatao. The idea that the current economic model needs to be observed from an ecological viewpoint is not just a demand from Brazilian scientists. The link between the economy and the ecology is becoming increasingly strong for a theory of sustained development. The "green" ideas are already being incorporated into the calculations of the gross domestic product, the GDP: a figure published annually, measuring the production level of nations.

#### Schools and Hospitals

Based on the new Green GDP, environmental devastation will receive a monetary value that will be subtracted from

the value of the traditional GDP. The more a country attacks its environment, the greater the rate of reduction in its GDP. Since the GDP is one of the main attractions for foreign capital investment, countries that do not respect their environment will be penalized with a decline in the investment level. Flavia Sekles, VEJA's Washington correspondent, was told by economist Herman Daly, from the World Bank's environmental department, that: "The Green GDP resulted from the awareness that nature has a very great economic value." Jose Eli da Veiga, an economist at the USP, remarks: "A country that preserves its nature also preserves its production capacity, giving security to the investor."

According to the Green GDP calculation, all money spent on environmental rehabilitation projects should be subtracted from the GDP. At first glance, it might seem that this deduction is a way of punishing good intentions for rehabilitating the environment. It is nothing of the kind. The green accounting requires deducting such expenses because it considers them wasteful. What is spent on such recovery is money that could be used for schools and hospitals. Last year, in the United States alone, \$115 billion was spent on the rehabilitation of nature: equivalent to 2 percent of its GDP. In Japan, that spending amounts to 3.4 percent of the GDP.

If the fortune spent on the rehabilitation of rivers and forests and on health programs for the population were deducted from the annual income of the country's factories, the green accounting could leave Brazilian society in a position to decide whether Cubatao, for example, is generating wealth that justifies the state of human and ecological misery created around it.

#### Canada-Brazil Agreement on Raw Materials Extraction Areas Signed

*PY1708031891 Brasilia Voz do Brasil Network in Portuguese 2300 GMT 16 Aug 91*

[Summary] Brazil and Canada have signed a technical cooperation agreement to preserve and protect areas from where raw materials are extracted in Acre State. This agreement will be financed with 10 million Canadian dollars provided by Canada and 5 million Canadian dollars by Brazil.

#### Government Opposes Amazon 'Restricted Sovereignty' Proposal

*PY1708121291 Rio de Janeiro JORNAL DO BRASIL in Portuguese 16 Aug 91 p 5*

[Text] Brasilia—The Brazilian Government will not comply with any international resolution issued behind its back that could jeopardize the country's sovereignty, be it under the pretext of preserving the Amazon, fighting drug traffic, or protecting human rights. Brazilian Foreign Minister Francisco Rezek made this statement on 15 August during his testimony lasting nearly four hours at the National Security Committee of the Chamber of Deputies. Rezek confirmed that the Brazilian Foreign Ministry has detected "certain movements" led by developed countries.

For now they are purely verbal and not a source of concern. "They have a right to free expression, just as we do," Rezek emphasized.

The foreign minister's statement was prompted by the proposal of French President Francois Mitterrand to declare the Amazon an area of world interest and allow Brazil "restricted sovereignty" over the region. The idea has the support of U.S. President George Bush and USSR President Mikhail Gorbachev. Rezek stated that he is prepared to discuss the environment issue at any international meeting called for this purpose, but made it very clear that the country will not comply with any decision that may jeopardize its autonomous development. "No international forum has the right to restrict our sovereignty," according to the minister, who went so far as to cast some doubt on the "trustworthiness" of the United Nations, which in his opinion must still be "de-ideologized, legitimized and democratized."

Rezek believes that Brazil is unlikely to see the Rio-92 meeting turned into a tool of aggression aimed at national sovereignty. He also believes that the development issue will take precedence over the environment because in his opinion even the rich countries will come to accept that if they do not help Brazil to overcome its technological backwardness it will be impossible for them to expect from Brazil effective, nonpredatory exploitation of natural resources.

#### **Minister Orders Investigation of Amazon Religious Missions**

*PY1708133491 Madrid EFE in Spanish 1914 GMT  
16 Aug 91*

[Text] Brasilia, 16 Aug (EFE)—Brazilian Justice Minister Jarbas Passarinho on 16 August ordered an investigation into more than 21 non-Catholic religious missions involved in evangelizing natives in the Amazon region.

The investigation was requested by the congressional commission investigating the "internationalization" of the Amazon region, which covers more than 60 percent of the country's territory.

According to commission chairman Deputy Atila Lira, the leaders of those religious missions do not respect the culture of Amazon region Indian communities and are more concerned with the region's mineral wealth than with evangelizing natives.

Social Democratic Deputy Beth Azize told the congressional commission on 15 August that the Brazilian consulate in the U.S. city of Los Angeles grants some 100 visas per month to people who affirm they want to evangelize Amazon region natives.

Azize recommended that the congressional commission ask the Foreign Ministry for a complete report on the number of foreigners who enter the country for evangelical purposes.

The congressional commission was created three months ago to investigate reports that foreign companies and

governments—not further identified—would be interested in the Amazon region and that the religious missions would be working for them.

## **CHILE**

### **Antofagasta Respiratory Illness Increase Attributed to June Flood**

*91WN0635A Santiago EL MERCURIO in Spanish  
12 Jul 91 p C7*

[Article by Carlos Herrera Astorga]

[Text] Antofagasta—A 235-percent increase in respiratory illnesses has resulted from airborne dust from the dried mud deposited by the 18 June flood, according to city health services records.

According to Peoples Program Head Dr. Maria Cristina Rojas, the levels for children increased by 219 percent, with an average of 760 cases per week, compared to 347 in normal times. For adults the increase was 322 percent, that is, the normal 68 cases per week climbed to 219.

Measurements from high-volume analyzers, the technical instruments used to measure air quality, have recorded up to 1,210 micrograms of solid airborne particulates per cubic meter of air, with the country's maximum standard being 260 micrograms. This means that normal standards were surpassed by a factor of four.

To ameliorate the situation, health authorities have requested that the regional government take a series of measures ranging from restricting traffic to sweeping the streets and highways 24 hours per day.

The latter activity involves 100 people, municipal workers, and an extra 400 workers have been called in under a special program, and who for a monthly salary of 33,000 pesos will be employed sweeping the city.

In addition, according to Municipal Secretary Rodolfo Gomez, head of the sweeping plan, a company from the capital has offered to send the city a sweeper for free, with the Las Condes commune only having to pay fuel costs and expenses for the three operators. The city official estimated that the situation would be resolved within 30 days.

Meanwhile, Regional Health Director Dr. Manuel Zamorano indicated that an increase in obstructive bronchitis had been detected among Antofagasta residents, which is treated by "dilating the bronchial tubes with bronchial dilators in tablet, lozenge or aerosol form, with which doctors' offices have been duly supplied."

For his part, Health Service Environmental Program Head Manuel Quezada explained that the four instruments used to measure airborne particulates (one belonging to the Service, two to Codelco [Copper Corporation] and one to Mantos Blancos) work by breathing air through a paper filter.

The particulates are retained and by measuring the difference in the filter's weight after 24 hours of use, the concentration of airborne particles is determined.

The final measurement taken on the corner of Cautin and Salar del Carmen streets, the area most threatened by the flood, indicated 1,210.48 micrograms per cubic meter, four times higher than the normal 260 micrograms per cubic meter.

#### Level of Assistance

Government assistance to the Second and Third Regions has increased to 177.643 million pesos, according to the National Emergency Office of the Interior Ministry in Santiago, ONEMI.

Of that amount, 150.415 million pesos will go to the Second Region and 27.228 million to the Third.

According to ONEMI records, more than 93 million pesos were given to the Antofagasta region in blankets, air mattresses, blackboards, water tanks, tents, sofas, sleeping bags, food, storage bags, toiletry kits, cans, and other household goods. In addition, 25.878 million pesos worth of similar items were supplied to the Atacama region.

With respect to emergency goods, 400 [tons] have already been sent to Antofagasta, with a value of 54 million pesos; 25 to Taltal, for 3.375 million pesos; and 10 to Copiapo, valued at 1.350 million pesos.

A total of 3,020 kgs of assistance, consisting of Government consignments and donations, were sent to the country's northern areas.

Three hundred shelters for those who lost their homes in the Second Region capital were loaded yesterday onto the ship "Malleco," thanks to the South American Steamship Company.

#### Use of Unleaded Gasoline To Be Introduced Next Year

*91WN0635B Santiago EL MERCURIO in Spanish  
14 Jul 91 pp C1, C6*

[Article by Mireya Urbina]

[Text] Chile will be the first nation in South America to introduce unleaded gasoline. This antipollution fuel is heavily used in Europe and the United States, and a distribution company here already plans to establish a network throughout the country, from Arica to Puerto Montt.

Next year regulations requiring (it has still not been determined whether only for Santiago) imported automobiles to have catalytic converters will come into effect.

This measure will result in the need to incorporate the production and sale of unleaded gasoline in the national market. Since traditional fuel destroys the converters, automobiles equipped with them will only be able to operate in areas where unleaded gasoline is available.

In addition, emission standards for gasoline automobiles, a prerequisite for this import requirement, have been practically approved and will soon be announced, according to Regional Transportation Ministry Secretary Hector Pena.

Adoption of this initiative has been considered within the framework of the Santiago Antipollution Plan, since increased levels of ozone and carbon monoxide, polluting gases emitted by cars, have been detected.

#### Pilot Plan

Almost a year after its implementation, progress has already been achieved. A pilot project is underway with 50 taxis equipped with catalytic converters, the results of which will permit the technology to be introduced to the capital's taxi fleet.

In addition, some 50 private imported cars equipped with catalytic converters are already operating in Santiago, and the fuel distribution companies participating in the pilot project with some gasoline pumps are already providing fuel.

The private sector has been concerned with the new technology that is fast approaching. Copec [Chilean Oil Company] plans a distribution network for unleaded gasoline, and has performed complete technical, marketing, and distribution studies.

"We need the regulations for unleaded gasoline to be defined and the relevant tax to be established, in order to sell to the public and have Enap [National Petroleum Enterprise] offer this product for sale as one additional line of fuel," says Engineer Carlos Lonza.

Special Antipollution Commission Executive Secretary Juan Escudero highlights the decisiveness with which these companies have acted, "on committing themselves to this process without waiting for a law to force them to do so."

He adds that "it is something unique in the world, since in other countries this has been done against the will of the private sector and it has taken years to come to an adequate political consensus."

#### Technological Package

The reasons for implementing this "technological package" involving catalytic converters and unleaded gasoline in Chile are explained by engineer Juan Escudero, who states that Santiago's air pollution contains other elements that are more serious than the particulate material, such as carbon monoxide and ozone emitted by cars.

On two occasions in 1990 and on three this year, emergency conditions occurred with high levels of gases. Escudero points out that during the summer, when particulate pollution decreases, carbon monoxide and particularly ozone levels increase. "This," he says, "is the so-called photochemical smog or the 'Los Angeles smog.'"

He emphasized that the problem goes hand in hand with the country's eight percent annual growth in the number of cars.

#### Worldwide Use

Unleaded gasoline has already been introduced on a massive scale in developed countries. In Europe there are service stations with that type of fuel in all countries. England has converted around 40 percent of its automobile fleet to unleaded gasoline. In the United States, where the process of conversion began 15 years ago, gasoline with lead is almost never used.

Nevertheless, this technology has still not been incorporated in Africa, while in Japan it is now common.

Singapore, Malaysia, and Hong Kong are introducing it this year and Thailand is considering it for the future.

No South American country utilizes this type of fuel, and only in Chile have initial experiments been conducted.

At the service station on the corner of Vicuna Mackenna and Malaquia Concha, Copec serves 15 taxidriviers participating in the Special Antipollution Commission's pilot project, as well as 25 private drivers who have vehicles with catalytic converters.

Unleaded gasoline is sold at 132.90 pesos per liter, "cheaper than 93-octane gasoline," it is said.

This was explained by Copec Engineer Carlos Lonza at the XIV Engineering Systems Workshop organized by the University of Chile.

The executive referred to the company's predictions of the imminent introduction of unleaded gasoline into the domestic market, the new policy of emission control and the importation of automobiles equipped with catalytic converters.

In his view, the Government is an important agent in the introduction of unleaded gasoline, because its responsibility is to issue the corresponding regulations. He maintained that "governments have an interest because in some form there can be tax benefits or those fuels can be used to correct tax distortions on various fuels on the market."

It is hoped that Enap can increase production volume in the medium term so that companies can import the amounts needed for domestic supply.

Some technical issues have to be considered. According to Lonza, introducing unleaded gasoline makes it necessary to reestablish the grade and octane rating. In Chile standards already set octane at 91 and allow the freedom to introduce higher octane in imports or through Enap production.

"From the technical and marketing point of view, we believe that a higher octane rating is better, because it allows the opportunity to use more efficient engines and contributes to reducing pollution. In Chile's case, converting to engines using leaded gasoline with 93 to 91

octane is a problem. The ideal is to convert to unleaded gasoline with the same octane rating."

#### Pricing and Coverage

With respect to price, he indicated that a higher price for unleaded gasoline will reduce demand and discourage drivers without catalytic converters from using it. But on the other hand, it punishes those who use a fuel that pollutes less.

Worldwide, the price of unleaded gasoline is lower despite higher production costs, because of the high volumes.

"In Chile incentives could be established through specific taxes on unleaded gasoline being less than those on leaded fuel, and the prices over time would achieve parity with import prices," he stated.

Regarding coverage, the specialist proposed retail sales of unleaded gasoline for Santiago or cities like Valparaiso and Concepcion, with air pollution problems stemming from emissions from gasoline-powered vehicles.

Nevertheless, in the spirit of good client service the company has established a supply network from Arica to Puerto Montt which in the first stage will have approximately 50 service stations: 30 in Santiago and 20 or 25 around the country.

With respect to supply in the outlying areas, he adds that it has not been completely studied, but that it is being considered.

And what about drivers who want to go to Mendoza or Bariloche? Argentina does not have that kind of gasoline.

"We have not yet resolved that problem, but the question has been raised," the engineer responds.

#### Isolate the Lead

Lonza discussed in detail new product promotion, educating the public on the issue, requiring guarantees for the catalytic converters, and adequately maintaining vehicles, "because if the car is not tuned up, it reduces the usable lifespan of the converter."

From the point of view of fuel use, he emphasized that the primary concern is to avoid lead pollution, for which investment and increased operating expenses in the different stages of the product's refining cycle are anticipated: storage plants, tank rehabilitation, transport by truck, train, tanker ship, oil pipeline, etc.

The service stations will also change in appearance. They must install special hoses, standardize the nozzles on the gasoline pumps (narrow nozzles for unleaded gas), and be painted a distinct color, in addition to acquiring the necessary stickers and signs to prevent either the attendant or the motorist from committing the error of mistaking one fuel for the other.

## COLOMBIA

### Ecopetrol Plans Conversion to Nonpolluting Gasoline

91WN0628A Bogota *EL ESPECTADOR* in Spanish  
27 Jun 91 p 14A

[Text] Ecopetrol [Colombian Petroleum Enterprise] is studying adding new elements to gasoline to improve its quality. In Bogota it will not be necessary to apply the full measures. Since last January gasoline has contained no lead, the worst polluter. Plans are to construct a refining plant in Puerto Triunfo, Antioquia.

Various stages are being contemplated in Ecopetrol's plans to convert to environmental gasoline: The suppression of lead in gasoline, a step that has already been taken; the application of certain additives, which is still being studied; and the mixing of foreign gasoline to increase octane in domestic fuels, leading to less air pollution in the cities from automobile engines.

The new gasoline refining process the company is studying will not be applied in its entirety in Bogota since greater power capacity in fuels is not required in the capital because of its high altitude.

This is according to Company Technical Director David Cala Heredich, who yesterday disclosed a package of ecological proposals that have been worked on for several years, and explained the extent of the utilization of the so-called ecological gasoline in the rest of the country.

Cala Heredich indicated that among the projects being contemplated in this package is encouragement—through advertising campaigns—of increased use of "extra" gasoline in low altitude areas. Current consumption of the product is 20 percent, and the goal would be to increase it to 30 percent.

In any case, people in those areas not wishing to use the "extra" gasoline could purchase the current type, which will be sold with higher octane.

He added that in those places the engines, because of their design, require higher octane in the gasoline they use, with the "extra" fuel fulfilling that requirement. He indicated that 70 percent of the automobile fleet in the country is in the Andean region and the rest is at sea level. Thus, for every 300 meters of altitude, 1.5 to 2 additional octanes are required.

In Bogota's case, at 2,600 meters above sea level automobile engines need between 12 and 15 octanes less to run normally and without pollution.

#### The Phases

The idea of the entire project is to increase the octane in the gasoline. The Ecopetrol Technical Director explained that for several years there have been market studies for a more efficient and less polluting fuel: the first phase of the

project began to be carried out last 1 January, when the lead content in domestic and imported fuels was eliminated.

Colombia is the first country in Latin America to adopt this measure, in seeking to reduce the high levels of pollution in its principal cities; in European countries and in the United States lead was eliminated from gasoline because of its toxicity, since the human body confuses it with calcium and assimilates it.

The second phase, to be carried out in 1992, consists of modifying processing plants to improve fuel quality. Although it is still being studied, it is possible that an intermediate conversion plant would be constructed in Puerto Triunfo, Magdalena, middle Antioquia.

Another of the goals is to add additives to the gasoline that will clean the engines and allow good power but will not pollute, like lead. Implementation of this phase requires an annual investment of \$40 million during the 1990's to construct tanks, pumping stations and pipelines.

In addition to the above, during this decade polluting vapors in the gasoline—used in engines for cold starting—will be reduced, as will odorous substances, which in Colombia appear at a 40- or 50-percent level, when regulations call for 25 percent.

Thus in the 90's one will speak of reformulated fuels, which will be the most efficient and least polluting, since current gasoline will increase from 80 to 86 octane and "extra" from 92 to 94.

That will be accomplished through technical mixture of the imported gasolines—at 95 octane, especially in Venezuela and the Antilles—with domestic.

#### Bogota

The Health Ministry, the Health Secretariat, and a team of Japanese experts are currently working in the city in environmental diagnostic programs, to determine the steps to follow to complement this national fuel policy.

Some results have established that there is excess carbon monoxide, sulphur and oxygen during peak hours, which in contact with humidity produce the effects of so-called acid rain.

For his part, Environmental Department Administrative Director Agustin Velez Bustillo said that policies are needed to permit local authorities to develop specific plans against environmental pollution.

He said that environmental policies will thus be transformed into action.

## GUYANA

### Tropical Wildlife Research Center To Be Funded by Canada, U.S.

FL1908112591 Bridgetown CANA in English  
2102 GMT 18 Aug 91

[Text] Geneva, Aug 18, CANA—A joint programme, backed by a U.S. 755,000 dollar contribution from the

Royal Bank of Canada, will develop a centre in Guyana to study, document, and promote conservation of tropical plant and animal life, the World Wide Fund for Nature (WWF) reported. The centre for the study of biological diversity is being developed by WWF-Canada, WWF-United States, the Smithsonian Institution, and the University of Guyana.

WWF, headquartered in Switzerland, will use the contribution to finance the construction and operation of the center in Georgetown, Guyana, and later smaller field stations to document and preserve nature, and promote the conservation of biological diversity, the current bimonthly WWF newspaper said.

"Guyana is one of the few tropical countries left in the world where conservation can still be integrated into the country's plans for development," said Jane MacKnight of WWF-United States, part co-ordinator of the project.

Smithsonian and the University of Guyana have been studying Guyana's vegetation since 1984 and the scope will now expand to all land and water plants and animals, with the prospect of later including neighbouring Suriname and French Guiana.

The newspaper notes that Guyana's 215,000 square km, populated by fewer than a million people, contain a variety of flora and fauna which can still be protected in the face of a real threat from expanded natural resource extraction, including bauxite and gold mining.

"There is little development in the interior of the country so the greater part of the native flora and fauna remains undisturbed. Eighty-four percent of the country is covered by lowland tropical rainforest, containing an estimated 1,000 valuable timber-yielding species.

"... Between 7,000 and 10,000 species of flowering plant can be found in Guyana and its neighbours Suriname and French Guiana, of which 50 percent may be endemic," WWF reported.

"The country is often a haven for threatened animals," it said, adding that more than 1,100 species of animals have been recorded while their populations remain uncertain due to the lack of wildlife censuses.

The north-western coast is "an important nesting site" of the endangered hawksbill, leatherback, olive ridley, and green sea turtles, while the large harpy eagle appears "relatively secure" in parts of the country despite its threatened extinction in a wide area of the Americas.

"However, without urgent conservation efforts, Guyana will not remain pristine for long," WWF warned. According to the fund, current proposals for major expansion of timber cutting, and bauxite, gold, and diamond mining threaten thousands of plant and animal species some of which are "undescribed by scientists."

"Yet there is still time to work with the government of Guyana to make recommendations for protected areas and

sustainable use of the rain forests, and to survey the country's flora and fauna," WWF-United States officer Jane MacKnight said.

## TRINIDAD AND TOBAGO

### IDB-Financed Environmental Program Set To Begin

*FL0208202191 Bridgetown CANA in English  
1855 GMT 2 Aug 91*

[Text] Port of Spain, Trinidad, Aug 2, CANA—The Inter-American Development Bank [IDB] is financing a far-reaching program in Trinidad and Tobago aimed at protecting key natural sites and rehabilitating damaged lands and coastal areas.

"The program represents a new breed of IDB-financed environmental activities in that environmental protection is its primary mission," a report in the bank's newsletter, "The IDB," said.

In all five projects making up the program, local nongovernmental organisations will play major roles in designing the protection activities and carrying them out. The program will be administered by the Ministry of the Environment and National Service with the help of a U.S. 4 million dollar IDB loan and a U.S. 238,000 dollar technical cooperation grant.

The centre-piece of the new program will be a project to protect the Caroni Swamp National Reserve. Only 3.5 km from the capital city of Port of Spain, the 5,600-hectare mangrove wetlands provide habitat for more than 160 bird species as well as a great variety of other wildlife and marine species. The reserve's chief attraction is the scarlet ibis, a bright red wading bird with a down-curved bill. The birds are an important tourist attraction, and boat excursions to view them are conducted by private guides and park personnel.

The new project will improve access to the reserve for visitors while at the same time more closely regulating human impact on the area's plants and animals. Principal works will include a visitor's center with exhibits, an auditorium and library, and boat house and docks for tour, rental, and patrol boats. Two wooden towers will give visitors panoramic views of the ibis roosting area and the swamp and mangrove forest.

An environmental education program to promote a greater awareness of the importance of swamps and wetlands will be prepared by the Environment Ministry's forestry division in conjunction with conservation groups and interested citizens. Studies in marsh ecology and hydrology will be carried out to determine what must be done to enable the scarlet ibis to re-establish breeding colonies in the reserve.

The bank-financed program also includes the rehabilitation of the San Fernando Hill national landmark, a unique geological formation composed of limestone-chalk. Rising 200 meters above sea level in the city of San Fernando, the



hill was previously covered by an unusual forest, including many large trees. But years of quarrying have left the hill scarred and stripped of much of its vegetation. Works will be carried out both to revegetate the hill and to improve facilities for visitors. Environmental education activities will be developed by the forestry division, non-governmental organisations, and interested citizens.

Reforestation is also the objective in the mountains of the island's northern range, which has been extensively cut and converted to farms, IDB officials say. Plantation species will be used as well as trees specially selected to eventually recreate the original forest.

Another project will improve the quality of life in Laventille, the birthplace of the Trinidadian steel band. The modest dwellings, sprawled up the hillsides just outside of

Port of Spain, are easy victims for erosion and flash flooding during the rainy season.

The works, which have been designed and will be carried out by community members, include the construction of retaining walls, sidewalks, street drains, and areas for recreation, and the planting of trees and shrubs. The project will create immediate benefits through the employment of large numbers of local people, women as well as men, many of them currently unemployed.

Preventing erosion is also the objective of a project to rehabilitate and protect the sea coast village of La Brea, about 72 km south of Port of Spain. The La Brea project includes the repair and extension of a sea wall and the renovation of an outstanding example of colonial architecture. The Institute of Marine Affairs will monitor sea and coastal activities to determine environmental effects of the sea wall and other erosion protection works.

## REGIONAL AFFAIRS

### Report Charges Israel 'Stealing' Sinai, Nile Water *NC1608173691 Cairo AL-SHA'B in Arabic 13 Aug 91 pp 1, 9*

[Report by 'Abd-al-Fattah Fayid]

[Excerpts] The People's Assembly Arab Affairs Committee, chaired by Sabri al-Qadi, has issued a report charging that Israel is stealing Egyptian underground water in Northern Sinai. The report also charges that Israel is implementing six dam projects at the sources of the Nile in Ethiopia, which threatens Egyptian national security because 85 percent of Egypt's water resources originate there. The report warns that Israel shortly will launch a war to seize Arab water sources in Jordan, Lebanon, and elsewhere to solve the aggravating water crisis resulting from Jewish emigration to occupied Palestine. [passage omitted]

The 26-page report says Egypt is on the verge of facing water shortages for the first time, either through Israel's threats to the Nile's sources or its stealing of underground water in Sinai. [passage omitted]

The report lists the projects Israel has carried out for this purpose and the political support it has given some African regimes to achieve its goals. The report says Israel supported John Garang in Sudan and Idin Amin in Uganda so it could control the sources of the Nile and choke Egypt. The report says Israel now has the advantage in Africa.

The report says the Israeli theft of Egyptian water in Sinai has not stopped. It says huge projects to draw water from Sinai are continuing. Israel has built a huge dam in the al-Kuntillah area near the Egyptian border to prevent water seeping into Egypt.

The report says Israel has pumped out 200 million cubic meters of Sinai underground water, mostly from the al-Jarafi valley underground reservoir near the border in northern Sinai. [passage omitted]

## EGYPT

### Cabinet Plans 'Green Belts' Around Major Cities

*91WN0622A Cairo AL-JUMHURIYAH in Arabic  
10 Jul 91 p 6*

[Article by Yusif 'Abd-al-Rahman and 'Isam al-Shaykh: "Comprehensive Environmental Plan in Egypt; Green Belts Around Cities and the Northern Coastline"]

[Text] Minister of Cabinet Affairs and Minister of State for Administrative Affairs Dr. 'Atif 'Ubayd emphasized that the era of President Husni Mubarak has been characterized by a concerted effort to establish a link between development and the environment. He pointed out that Egypt has been interested in environmental issues since the days of the ancients and that several of its scientists occupy positions of distinction with international environmental organizations.

In remarks before the African Environmental Conference yesterday, he called upon individuals and nongovernmental organizations to adopt beneficial projects and to prepare individuals to accept mandatory modification of environmentally damaging behavior.

He advanced a seven-point comprehensive plan to improve the environment in Egypt and link it to development. It includes:

1. Begin experimental projects on green belts around major cities and along the northern coastline.
2. Arrange at a series of major projects to store water, treat and re-use drainage output, collect rainwater along the northern coast, exploit subterranean water, and modernize field irrigation.
3. Conduct a comprehensive survey of soft and firm waste and devise a series of waste treatment projects to be carried out as expediently as financial resources allow.
4. Co-sponsor with Saudi Arabia a conference of Red Sea states to protect the waterway from pollution along the lines of a cooperation agreement Egypt signed with other Mediterranean countries for the protection of that sea.
5. Expand land reclamation. Conserve cultivable land and protect it against non-agricultural development.
6. The Ministry of Culture is currently preparing a series of projects for the preservation of historical monuments. "We hope to see the world hasten to join in the implementation of these projects in the manner of the great Ra's Muhammad accomplishment which was supported and financed by the European Community."
7. Arrive at the ideal means for controlling exhausts, gases, vapors, and dust. The choice of technology will depend on factors of efficiency, cost, and the availability of financing, especially from foreign sources.

### Meeting Views Ban on Coastline Oil Exploration

*91WN0622A Cairo AL-JUMHURIYAH in Arabic  
18 Jul 91 p 7*

[Article by 'Abd-al-Rahman Mustafa and al-Shadhali Mu'awwad: "The Minister of Tourism: 'We Agreed With the Minister of Petroleum To Ban Coastline Exploration'"]

[Text] A joint meeting will be held in the town of al-Ghardaqah in the mid-September to devise controls for protecting the governorate's environment and tourist attractions from pollution caused by new oil exploration operations. The meeting will be attended by the ministers of petroleum and tourism and the governor of the Red Sea governorate, as well as investors in the governorate.

Gen. Salah Misbah, governor of the Red Sea governorate, said the upcoming meeting would delineate the regions of the governorate where [oil] exploration would be banned. It would also discuss the creation of a joint fund to be underwritten by the ministries of tourism and petroleum.

Dr. Fu'ad Sultan, minister of tourism, told a meeting in al-Ghardaqah yesterday that agreement was reached with

Dr. Hamdi al-Banbi, minister of petroleum, to forbid oil exploration along the coastline and offshore from it. It was also agreed to remove all exploration debris in those areas in order to protect tourism and the environment.

## INDIA

### Environment Ministry Unveils Plan for Depollution of Major Cities

91WD1068A Calcutta *THE STATESMAN* in English  
4 Jul 91 p 14

[Text] New Delhi, 3 July—The Environment Ministry will soon launch a scheme for “completely depolluting” the four metropolitan cities, Delhi, Bombay, Calcutta and Madras, reports UNI.

The Environment and Forests Minister, Mr. Kamal Nath, announced here yesterday that to begin with, at least one of the worst-polluted areas in each of the four cities would be identified and taken up for thorough depollution.

Mr. Kamal Nath said non-governmental voluntary organizations would be involved in the task of making the four metros “model cities” of the country in the matter of environment.

The scheme, he said, would be gradually extended to other areas of these cities and these would be selected on the magnitude of pollution.

Other big cities would later be brought under the purview of the scheme in a phased manner, he said.

Mr. Kamal Nath said extensive surveys would be carried out in the identified areas to assess the extent of environmental degradation. Surveys, he said, would also be carried out on the ways to take corrective action.

He said the polluting units would be first to adhere to the environmental standards, failing which strict action would be taken against them under the law.

Mr. Kamal Nath said the idea that the only course open was to go in for environmentally sustainable development had to be imbibed in the industry and the people.

He said he was so serious about the matter that even public sector units and hotels would not be spared if they were found flouting the laws.

“It is high time we learnt how industry and development could be environment-friendly without compromising on the future of the country,” he added.

### Immediate Protective Measures for Orissa Coastal Area Urged

91WD1079A Calcutta *THE STATESMAN* in English  
12 Jul 91 p 8

[Text] Bhubaneswar, 11 July—The greenhouse effect and the consequent warming of the globe is no longer a myth but cruel reality staring the world in the face, but is the world prepared for it?

Climate changes are visible and the common factors emerging from computer models point towards a drier America, a warmer Europe and a wetter Indian subcontinent by the year 2000, reports PTI. The other forecast for India is that it would increasingly experience more destructive cyclones, sea surges and coastal inundation, a noted environmentalist has warned.

Professor Radhamohan, recipient of the “Global 500” award instituted by the United Nations Environment Programme in 1989, said that immediate measures needed to be taken in right earnest to protect the vulnerable, long coastline of Orissa.

The public policy should address itself from now to protecting the coastal area which is both fertile and densely populated, he said.

“We should begin in right earnest to strengthen our coastal protection measures by raising a km-wide dense vegetation along the 480-km coast, protect and conserve the mangrove forests along the Kendrapara, coast, construct dykes wherever necessary and take up other required steps to meet future eventualities,” Professor Radhamohan said.

At the same time all pressures to go for short-term gains by vested interest groups should be resisted and the people should be made aware of the situation and bring pressure to bear on the government to undertake the required measures, he said, adding that the need was for a “strong political will” by the rulers.

The Orissa coast, vulnerable to cyclones originating in the Bay of Bengal, had to be strengthened against such calamities within the next few years before the impact of the greenhouse effect told on the people, he said.

The depletion of the ozone layer, the build up of carbon dioxide in the atmosphere and other such lethal changes were continuing, despite the concern being expressed all over the world against the degeneration of the environment and the emergence of the green movement.

Professor Radhamohan said that though awareness was building up in the industrialized countries to reduce emission of greenhouse gases, the gases already released into the atmosphere and their “long residence time” was enough to raise the atmospheric temperature because of the “synergetic impact” of the gases—one gas acting in tandem with another to produce a greater impact.

The attitude for the planners and rulers today ought to be “to think globally and act locally,” he said.

All steps must be taken to adopt safeguards against cyclones as it could cause devastation to the tune of hundreds of crores of rupees, as had often happened in Andhra Pradesh and last year’s floods in Orissa’s Ganjam district.

Concern for the future generation should “guide all our actions and their interest should be paramount in the minds of thinkers,” he said.

## IRAN

### Rising Caspian Sea Threatens Port Facilities

91AS1219Z Tehran KAYHAN INTERNATIONAL  
in English 10 Jul 91 p 1

[Text] Bandar Anzali, Gilan Prov. (IRNA)—The rising Caspian Sea waters have so far washed away an Islamic Republic Navy jetty here, putting fishing jetties and other port facilities on the verge of inundation.

The Caspian Sea said to be advancing by five to seven centimeters per day, has inundated parts of Port Taleqani near here, sending its residents wandering outside their homes for fear of being attacked by poisonous snakes.

Interviewed by IRNA, some workers complained that their homes have been attacked by snakes and frogs and their family lives disrupted as a result of the encroaching waters. They also demanded the government to help them immediately.

Since the Caspian Sea, the world's largest lake which separates Iran and the Soviet Union, began to encroach upon the land on its Iranian side, it has covered with 15,000 cubic meters of sand houses, streets and lanes in Port Taleqani and Port Shahid Beheshti.

There are other reports on the inundation of coastal line houses and farmlands in Astara and Chaboksar, both in Gilan Province.

## JORDAN

### Water, Air Pollution Problems in al-Zarqa' City

91WN0636A Amman JORDAN TIMES in English  
30 Jun 91 p 3

[Article by Faris Sha'ran: "Officials, Residents of Northern al-Zarqa' Complain of Heavy Pollution"]

[Text] Amman—Three districts in Northern al-Zarqa' city, namely al-Hashimiyah, al-Sukhnah and Dulaylah are permanently polluted by fumes rising from factories, especially the Jordan Petroleum Refinery Company installations and al-Husseini Thermal Power Station. A bad smell from the local waste water treatment plant hangs over the area too.

Northern al-Zarqa' city abounds with factories and poultry and dairy farms and is inhabited by some 150,000 people who are prone to a number of diseases because of the fumes, the insects infesting the three districts and the very bad smell, according to local physicians.

Dr. Hamidan Ziyad, said in a statement to the Jordan News Agency, PETRA, that the pollution had caused the spread of a number of diseases, especially lung and skin allergies to the elderly.

Waste water leaking from the treatment plant has caused several cases of dysentery, Dr. Ziyad said. Furthermore, his clinic was visited by at least 25 people with typhoid resulting from the polluted water and air, he said. Dr.

Ziyad added that there was growing danger to public health from the fumes and the contaminated atmosphere.

Another doctor, Muhammad Hazimi, who is also director of the local health centre in al-Hashimiyah, told PETRA that a growing number of people have recently complained of respiratory problems and difficulty in breathing as well as asthma resulting from inhaling the fumes that belch out of the chimneys installed by the petroleum refinery. Dr. Hazimi said that the waste water leaking from the treatment plant and heading towards the King Talal Dam serves as a breeding area for mosquitoes, flies and other insects which have been infesting the region and causing the spread of disease.

Aggravating the problem for residents in the eastern parts of the affected areas, the highway linking Amman with Irbid and Jarash is now congested with traffic because the original road is closed for repair, local people were quoted as saying.

They said that the people of northern al-Zarqa', Um Silay, Gharisah, Zenia, Khirbet al-Samra', al-Mazra'ah, Dulaylah, al-Khalidah, al-Hashimiyah and al-Sukhnah as well as the free zone of al-Zarqa' were all severely affected by the fumes and the contaminated atmosphere.

Recently the number of people complaining about various types of diseases has increased, especially in the eastern part of the district which is closer to the refinery, Dr. Ziyad said.

Mayor of al-Sukhnah Taha Arsalan said that the contaminated atmosphere was a fertile climate for insects. The municipality would like to maintain continued spraying campaigns with insecticides. But lack of funds prevent it from conducting such a programme.

Furthermore, Mr. Arsalan said, the municipality lacks a proper dumping site for the refuse. This, and lack of sufficient drinking water aggravate the residents' problems even more.

The mayor of Dulaylah, Karim 'Awadat, said that the bad smell forces the residents to go out into the fields and away from their homes in the summer season. The Dulaylah area abounds with cattle farms and dairies which also give off bad smells, harmful to the public health, he said.

Refinery Director General Sa'al al-Tal admitted that the fumes were harmful to the public health but said that workers and technicians were doing all they could to reduce the effects on people by installing modern equipment and strictly abiding by public health requirements.

Residents of the three regions said that since Amman's sewage problem was solved at their expense when the al-Khirbah al-Samra' treatment plant was created in their midst, the capital's residents should contribute to the solution of their problem. They demanded that the factories whose fumes continue to plague the region should also make a contribution towards permanent solutions.

### Experimental Pumping Process To Supply Water to Amman Region

91WN0636B Amman JORDAN TIMES in English  
2 Jul 91 p 3

[Text] Amman (J.T.)—The Water Authority of Jordan (WAJ) will in the coming two weeks embark on an experimental water pumping process from Wala water springs, near the town of Madaba, about 40 km south of Amman, in order to help meet the growing need of water supplies in the Amman region during the summer season.

The announcement was made by engineer Mahmud Hiyari, director of WAJ's Operations Department, who said that installations and pumping stations at Wala and the village of Libb, between Amman and Wala, would be ready for operation by the end of this week.

WAJ said in April that the Amman governorate consumes up to 210,00 cubic meters of water daily, but the amount is expected to rise to 230,000 cubic meters a day during the summer.

Mr. Hiyari noted in a statement to the Jordan News Agency, PETRA, that the Wala spring would be supplying the Amman region with nearly 1,500 cubic meters per hour. Less water will be pumped to Madaba, which has less population, and the greater amount will reach the Amman area, Mr. Hiyari said.

The decision was taken to ease pressure on the governorates of Mafraq, al-Zarqa' and Irbid whose water resources were partially pumped to the capital, Mr. Hiyari said. Other water springs that have been supplying water to Amman are located at Azraq, Dulaylah, Suwaqah, and Qatranah.

WAJ said last April that the water authority last year pumped a total of 75 million cubic meters of water to Amman residents and that 55 percent of this amount came from the artesian wells in the Amman region.

Coinciding with the WAJ announcement, Minister of Water and Irrigation Samir Qa'war said Monday that his ministry was following proper procedures to follow up on preliminary study on the damages sustained by the crops in the Jordan Valley region in the past winter season. In a statement to PETRA, Mr Qa'war said that the Minister of Water and Irrigation had received a request from the prime minister's office for further clarifications about an earlier report, drawn up by an ad hoc committee, on the damages to agricultural products.

He said that the committee did not have sufficient time to complete its study of the situation and had not taken into consideration all technical matters and laboratory tests.

A group of 21 specialists from the ministries of water, health, municipal and rural affairs as well as the University of Jordan and the Royal Scientific Society (RSS) had prepared the initial report which was submitted to the government.

Referring to the pollution of water in the King Talal Dam, Mr. Qa'war said that a meeting would soon be held

between the ministries of water and industry and trade to study the case of each separate factory within the al-Zarqa' River Basin in order to determine the causes of the pollution and to find proper solutions for the problem.

He said that the government was keen on finding solutions to the pollution of surface and underground water resources.

The minister said his department was also eager to back industrial production in Jordan and boost the national economy provided that should not be at the expense of water pollution and the destruction of crops.

## SAUDI ARABIA

### Achievements of Water Desalination Program Lauded

91WN0592A Riyadh AL-RIYAD in Arabic 27 Jun 91  
p 3

[Article by 'Uqayl al-'Anzi: "Desalination Stations in the Kingdom Produce More Than 635 Million Cubic Meters of Water Daily; Kingdom Is the Largest Producer of Desalinated Water in the World"]

[Text] The total amount of water pumped daily by desalination stations in the Kingdom of Saudi Arabia is 635,183,817 cubic meters. These stations also generate more than 3,500 megawatts of electricity per day. These large quantities of sea water are pumped and desalinated by huge desalination plants scattered along the kingdom's eastern and western shores. These plants provide fresh drinking water to every city and village by means of a 3,000-km pipeline.

This fresh water is being provided as part of the development and growth services offered by the government of His Majesty King Fahd ibn 'Abd-al-'Aziz, the custodian of the two holy sites. May God protect the king and his crown prince, who is loyal to this generous country and devoted to providing the people with the ingredients for a happy life. This task of providing fresh water to the people is being carried out by the Public Organization for Water Desalination, which is playing a major part in building one part of this colossal cultural advancement. This organization, which left a clear imprint on the cultural makeup of the Saudi citizen, has managed, in a short period of time, to achieve the goal which had been set for it by our wise leaders. It built 26 water desalination plants with different production capacities. It built those plants in different locations according to the priority need of each location for fresh water. This organization has among its future plans a plan to deliver fresh water to every town, village, and agricultural settlement in our beloved country.

State support for this organization has been generous. Last year's budget allocations for operations and maintenance of the water desalination plants amounted to 740 million riyals. But the function of the organization was not limited to managing and operating these vital facilities. It contributed to the drafting of studies, plans, and programs to build new water desalination plants, water reservoirs, and

residential communities. The organization was involved in laying pipelines and conducting economic feasibility studies on proposed projects. In doing so, the organization relied on the biggest consultants in this field.

To put an end to some of the technical problems with using materials and chemicals and their effect on operational desalination plants, the organization established research centers to develop desalination methods and techniques, to develop operating and maintenance methods, and to determine the standard specifications required for materials used in plant processes. These materials are to be compatible with prevailing sea water conditions, such as temperature,

humidity, and salinity. The organization also showed an interest in developing national skills and giving people with skill and expertise the proper technical and administrative qualifications to manage, maintain, and operate the desalination plants and produce electricity. To that end, the organization established centers for theoretical and applied training. The number of trainees at these centers exceeded 848. Twenty-eight employees were sent abroad to study and to obtain graduate degrees in different fields. Saudis make up 49 percent of the workers employed by this organization, which has ongoing programs to employ Saudi citizens in all its sectors and technical facilities.

### First USSR Ecological Map Compiled

91WN0618A Moscow ZEMLYA I VSELENNAYA  
in Russian No 2, Mar-Apr 91 pp 26-30

[Article by B. I. Kochurov, candidate of geographic sciences, Institute of Geography of the USSR Academy of Sciences, under the rubric: "Ecology: Ecological Map of the USSR."] [The two maps included in this article were reproduced from color originals and do not accurately depict the color gradations of the original maps.]

[Text] The Laboratory of Comprehensive Geographic Forecasts of the USSR Academy of Sciences Institute of Geography has compiled our country's first map of the most critical ecological situations. It is called the Ecological Map of the USSR. It gives a comprehensive picture of the ecological state of the country's territory. The regions where nature-protection problems have developed—where water is being contaminated, forests degraded, soils eroded, and other negative processes are occurring—are marked on the map. The author of this article is the head of the group of scientists who worked on compiling the map.

#### Satisfactory, Strained...Catastrophic

The concept of the "acuteness of the geoecological situation" has emerged in ecology in recent years. Our studies have shown that the degree of this acuteness is described by the depth of change in natural conditions in a particular region and the consequences thereof—changes in the conditions of human life and health, natural resources, and landscapes. Six geoecological situations are distinguished by degree of acuteness: catastrophic, crisis, critical, strained, satisfactory, and provisionally good.

A **catastrophic situation** is characterized by profound and irreversible changes in the natural world, loss of natural resources, and a sharp worsening of human living conditions resulting mainly from a many-fold overload of anthropogenic factors on the landscapes of the region. A sign of a catastrophic situation is a tangible decline in the health of people in densely populated regions and the loss of genetic resources and unique natural objects.

A **crisis situation** is approaching the catastrophic one (if serious steps are not taken immediately the transition may occur very fast!).

In a **critical situation** significant and poorly compensated changes in the landscape occur, the threat of depletion or complete loss of natural resources (including genetic resources) and unique natural objects grows, and the living conditions of the population worsen significantly. Anthropogenic loads usually exceed established normative values and ecological requirements. With a decrease in or cessation of anthropogenic influences and conduct of nature-protection measures it is possible to normalize the ecological situation, improve the living conditions of the population, raise the quality of particular natural resources, and partially restore landscapes.

The **strained situation** is distinguished by negative changes in certain landscape components which lead to a comparatively minor reorganization of their structure, disturbance of particular natural resources, and in many cases a worsening of living conditions for the population. Where nature-protection measures are followed the strain in the ecological situation usually declines.

A **satisfactory ecological situation** occurs where insignificant landscape influences that affect people's health have occurred. These changes vanish in the processes of self-regulation of the natural complex and with the conduct of simple nature-protection measures. This category should include natural-economic systems that are kept in balance (cultural landscapes).

Landscapes that are little subjected to anthropogenic influences or the action of extreme natural processes are classified as **provisionally good** in an ecological sense.

#### How the Map Was Constructed

To compile a survey map of acute ecological situations in the USSR (this includes the first three categories) on a scale of 1:8 000 000 we first created a series of maps of that scale. The series included a map of contemporary land use in the USSR, a map of change in the geochemical soil potential of USSR landscapes as the result of anthropogenic influence, a map of disturbances of land in geological exploration and extraction of mineral products, and a series of thematic maps for particular regions of the USSR. In addition various cartographic, statistical, and literary materials on nature, the economy, and the population of the country were enlisted; a landscape map of the USSR (scale of 1:4 000 000) was also used.

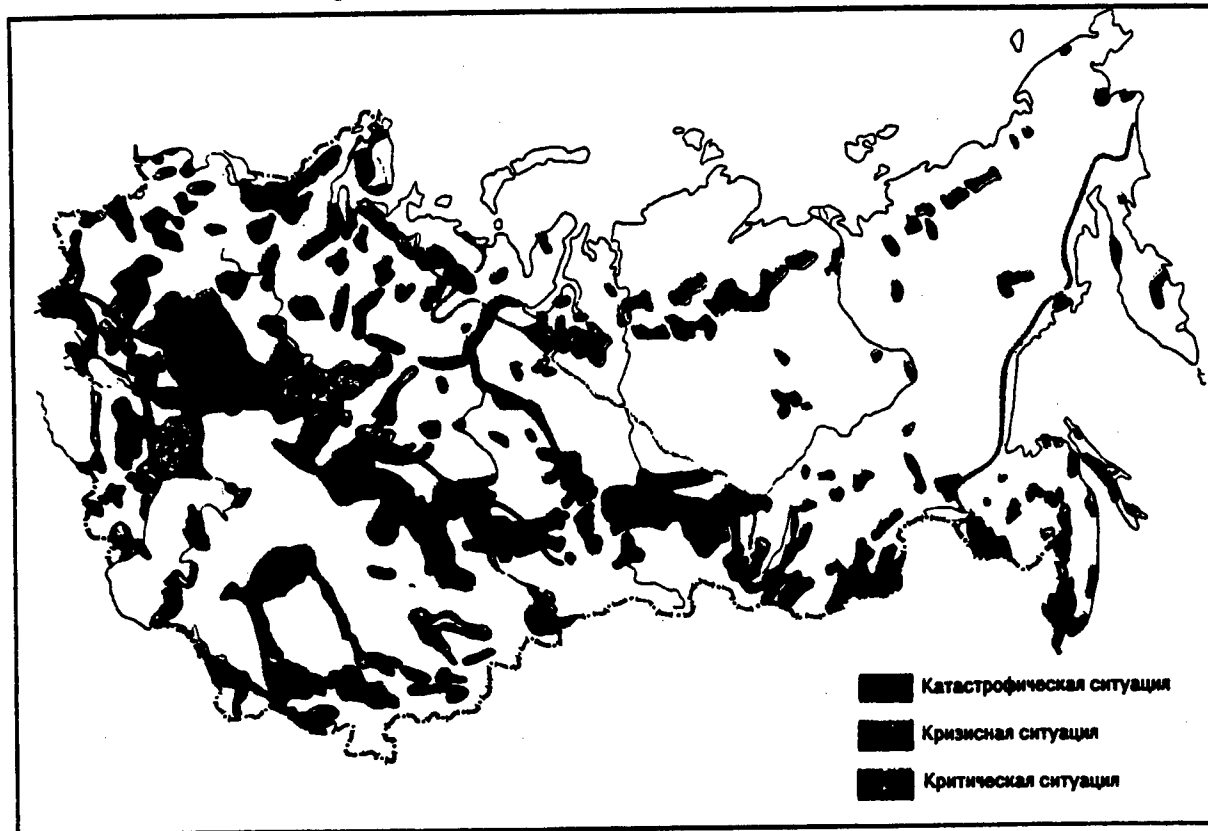
Many important data on anthropogenic loads or negative landscape changes are not shown on the ecological map of our country's territory which we made, however. For example, the State Committee for Hydrometeorology and a number of other organizations refused to give us information on buried radioactive material and contamination of a number of water basins.

For each region of the country we did a composite analysis of maps of contemporary land use, exploration and extraction of mineral products, land improvement, and so on. In the aggregate they reflect the different types and levels of anthropogenic loads. Where anthropogenic loads exceeded the natural potential of the landscape here it was noted by change in landscape features and conditions of human habitation and depletion or loss of natural resources, that is, by the emergence of a nature-protection problem. Where the geoecological problem is reaching the greatest acuteness (where various norms and ecological requirements have been exceeded) areals of acute ecological situations were singled out.

#### What the Map Shows

About 300 areals of acute ecological situations are identified, covering 3.7 million square kilometers or 16 percent of the country's area. Considering degraded reindeer and arid pastures this figure grows to 20 percent. The area of

Map of the Most Critical Ecological Situations in the USSR



The blue line is the southern boundary of the distribution of permafrost soils and the black line is the northern boundary of the distribution of dust storms. The green spots are the protective (protected) band of tundra forests.

individual areals varies from 600 to 420,000 square kilometers. The most areals are observed in the Far East (61), West Siberia (33), East Siberia (28), and the North of the European part of the USSR (22); this is chiefly linked to the development of mining-extracting industry and logging. The most significant areas occupied by areals with critical ecological situations are noted in Kazakhstan (637,000 square kilometers), Central Asia (400,000), East Siberia (523,000), and the Urals (326,000). Moldova, the Southern and Ural economic regions, the Kuznets Basin, the Middle Volga region, and the Kalmyk ASSR have the highest proportion of their territory occupied by these areals. The area of areals with acute ecological situations in the USSR is 15-20 times greater than the area of specially protected territories.

The areals are subdivided on the map by assortment of nature-protection problems into most complex, complex, and simple. Areal with the most complex sets of problems are mainly the result of the polluting impact of industrial centers as well as intensive use of natural resources (mining, agricultural production) and very high population density. Among them are the Donetsk Basin, the Middle Volga region, the Kuznets Basin, the Ural industrial zone

(from Nizhnyaya Tura to Chelyabinsk), the Fergana Valley, and others. The areals of the largest urban agglomerations, Moscow and Leningrad with their suburban zones, can be added to this group. The areal that encompasses the industrial zone of the Kola Peninsula and Norilsk is also included here. The critical ecological situation there is being created by the very low resistance of the natural landscapes and low degree of self-cleansing, dispersal, and the like. The total number of most complex areals is 45, and their area reaches 676,000 square kilometers or three percent of the country's entire territory.

The complex areals with fairly large assortments of problems (usually more than three, among which the main one is depletion or loss of natural resources—land, water, and forest) do not differ from the most complex areals in terms of acuteness and in some cases present an even greater threat to human health (for example the Aral Sea region and Moldova). This group also includes the areals of mines, water pollution, and degradation of forests as well as areals where a tendency toward the development of polluting factors is observed (the existence of an industrial center with a relatively high level of pollution). The total area of areals of the second (transitional) group is 646,000 square kilometers or three percent of the entire country.



The **simple areals** are linked with depletion and loss of particular types of natural resources. These are regions with intensive logging, bodies of water that are polluted and in part have lost their resource significance (Lakes Onega and Ladoga), badly eroded arable and pasture lands and lands subjected to deflation (the central chernozem oblasts and Northern Kazakhstan), and the degraded pasture lands of the Kalkmyk ASSR. The acuteness of the situation is determined here by significant loss of biological productivity and fertility of the soils. This category of areals also includes territories where there is a threat to genetic resources and unique natural landscapes are being lost. It is difficult to restore them (for example Lake Baikal).

The total area of simple areals reaches 2,284,000 square kilometers or about 10 percent of the country's entire territory. Among them areals with badly eroded soil constitute 373,000 square miles, degradation and overcutting of forests—534,000; intensive deflation of soils—670,000; disturbance of the land by mining work—162,000; and depletion and contamination of ground water—496,000 square kilometers.

The Ecological Map of the USSR shows that 26 percent of the country's population or **39 percent of the urban population lives in conditions of a critical ecological situation**. At the same time the proportion of the population that lives permanently in unfavorable ecological conditions differs greatly by economic regions, from 7.7 to 56 percent. These regions are divided into two groups. In half of the country's economic regions from 40 to 50 percent of the urban population (every other person!) lives in these areals. This includes the long-developed regions (the Ural, Southern, Donets-Dnepr, Volga, Central, and others) and new ones (West and East Siberia). In the second group of regions from 10 to 20 percent of the urban population lives in conditions of a critical ecological situation (the Northern, Volga-Vyatka, and Central Chernozem regions and the Baltic republics). The largest numbers of cities in areals with a critical ecological situation are found in the Ural (15), Central Asian (12), and East Siberian (11) regions.

Most of the areals with unfavorable ecological situations are found in natural zones. So the largest areals linked to overcutting the forest are the regions of the most valuable, in terms of quality, pine forests of the taiga zone with quite high productivity (the Karelian and Angara areals) as well as the most diverse and valuable, in terms of composition (oak and cedar), forests of the southern regions of the Far East. The largest areal with deflating soils (North Kazakhstan) is in the band of unstable agriculture on the line between the dry steppe and semidesert zones.

The distribution of areals of acute ecological situations by natural zones follows the following rules. Nature-protection problems in the **tundra and the forest-tundra** are largely related to overgrazing of reindeer pastures and mining work. A group of areals which have a well-expressed tendency to expand is taking shape in the oil and gas exploration and extraction regions in the northern part

of West Siberia. It is characterized above all by oil contamination of the environment, which is especially dangerous because of the low temperatures of the water, air, and soil and the weak processes of self-cleansing. Conditions of reproduction of fish resources are worsening because of the pollution. Pipelines and other engineering structures create obstacles for animal migration and sharply lower the biological productivity of reindeer pastures.

The primary reason for the nature-protection problems that are arising in the **taiga zone** is forest cutting that greatly exceeds the calculated cut. As a result the reserves of biomass are reduced, lands become swampy, and rivers become polluted (the North of the European part of the USSR, the Angara region, and the Urals). One more important factor is the extraction of mineral products.

In the **broad-leaf forest zone** nature-protection problems related to farming (soil erosion), urbanization, and forest cutting are typical.

The **forest-steppe and steppe landscapes** are characterized by a high level of crop farming (up to 70-80 percent) and loss of soil fertility (decrease in humus to 30-50 percent) as the result of soils washing away and ravines forming. On unbroken sectors, which are usually used as pastures, nature-protection problems are associated with livestock overgrazing (degradation and digression of pastures). Significant areas of fertile lands are being taken for nonagricultural needs.

In the **semidesert and deserts zones** nature protection problems arise chiefly because of irrigation of the soils (salinization, depletion and contamination of waters) and irregular grazing of livestock (degradation of pastures) which leads to further aridization (desertification) (see ZEMLYA I VSELENNAYA, 1990 No 2, p 33—editor).

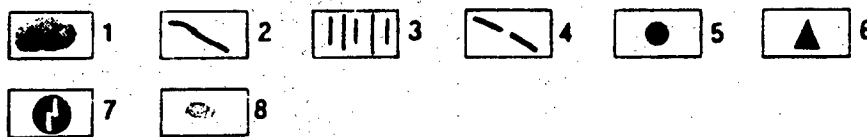
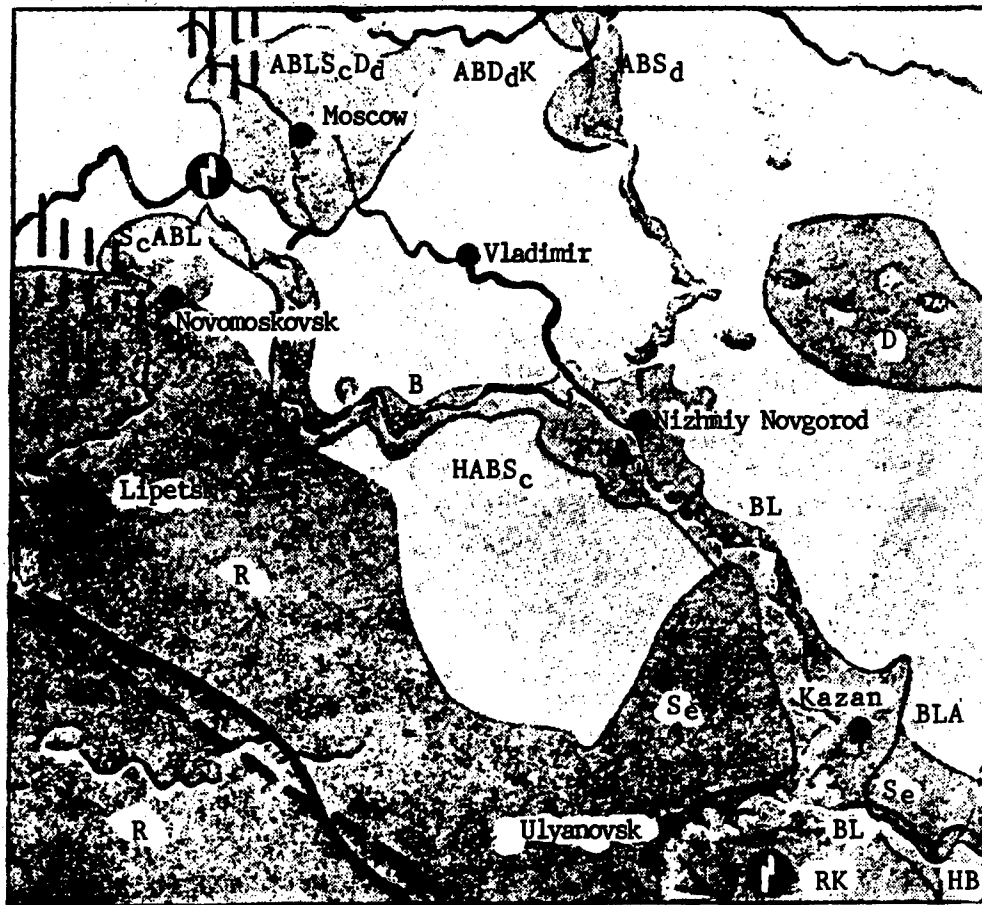
#### **We Need a System To Monitor the Condition of the Natural World**

Such a survey of the Ecological Map of the USSR cannot help but arouse concern and alarm. Scientific-technical progress cannot be stopped; it is an objective factor. But human beings must think about a more rational relationship with the natural world or ecological disaster is inevitable. Remember the Aral Sea, where such irreversible negative processes are occurring that the natural world there will hardly be able to restore itself in the coming decades, possibly centuries.

Human beings in fact can do a great deal. Here are a few examples. The Tallinn Pulp and Paper Combine has introduced a decontamination station that neutralizes the aggressive acidic waters that are discharged by production and formerly went directly into the gulf. Tilling without a moldboard has had good results in certain regions of Kazakhstan, Siberia, and the Ukraine. The soils there have partially restored their fertility and intensive processes of erosion and contamination have stopped.

A system to monitor the state of nature and natural resources must be introduced on an urgent basis. The Ecological Map has been given to the Supreme Soviet, the USSR Council of Ministers, the State Commission for Extraordinary Situations, the gosplans of the USSR and

Excerpt from the Ecological Map of the USSR (Scale 1:8 000 000)



Symbols: 1—areals of the most acute ecological situations; 2—areal of greatest depletion of ground water; 3—acid rain; 4—northern boundary of the distribution of dust storms; 5—cities with the highest level of atmospheric pollution; 6—large livestock complexes; 7—AES's; 8—preserves and refuges. Letters are used to designate types of nature-protection problems (from the Legend of the Ecological Map of the USSR). A—atmospheric pollution; B—depletion of water resources and water pollution; K—violation of the protective conditions of reserves and refuges; D—deforestation; Dd—degradation of forests; H—disturbance and contamination of lands during geological exploration and mining; Sd—deflation of soils; Sc—chemical contamination of soils; Se—erosion of soils; L—loss of agricultural and forest land; R—intensive ravine formation.

RSFSR, the gosstroys of the USSR and the RSFSR, and the USSR Ministry of Defense. An administration has been set up at the USSR Procuracy to keep track of compliance with nature-protection legislation. The map was also used in the expert ecological examination of the Conception and Main Directions of Economic and Social Development of the USSR in the 13th Five-Year Plan and the Period until the Year 2000. Analysis of the ecological map makes up a whole section of the National Report on

the State of the Environment in the USSR, which is prepared annually by the USSR State Committee for Protection of Nature.

An urgent task for the immediate future is working out and realizing national and regional socioeconomic and ecological programs aimed at bringing the many unfortunate regions in our country out of their catastrophic (or close to it) condition. It is time to adopt the most severe restrictions in development and siting of production in order to

gradually attain the necessary quality in the living environment. We mean ecological balance in the economic development of the republics and various regions where it is possible to reach a normal level of environment with maximal expenditures for ecological purposes. At the present time there must be accelerated social reorientation of the economy, a fundamental change in its structure, and organization of territory on the basis of the noosphere (rational) principle proposed by Academician V. I. Vernadskiy. I am confident that the Ecological Map of the USSR will help accomplish this task.

### **Social-Ecological Union Registered As Official Organization**

91WN0595B Moscow ROSSIYSKAYA GAZETA  
in Russian 4 Jun 91 p 4

[Article by Olga Plakhotnikova: "They Have Made the Transition to a Legal Status"]

[Text] *The USSR Social-Ecological Union was recently registered with the USSR Ministry of Justice. This union combines about 200 organizations and public associations from all the republics (except for Lithuania and Latvia).*

*Svyatoslav Zabelin, the chairman of the Social-Ecological Union, began to create his organization at a time when, for most people, the words "environmental protection" meant merely protecting rare species of wild animals and butterflies.*

Then, in 1985, the founders of this union decided the following: The goal of the future organization should be to protect and safeguard not only the natural and cultural environment, but also human beings, whose very existence is threatened.

The causes engaged in by the Social-Ecological Union are linked basically with shutting down such fratricidal projects as, for example, the lamentably well-known Tyumen Complex. At least half of the AES's [nuclear electric power stations] which have been shut down have been closed resulting from the activity of these "Greens." It was specifically they who began the campaign to declare a moratorium on constructing new AES's. As a result, such a moratorium has been adopted in Russia and the Ukraine.

Just a year ago such achievements were applauded. Not by the leading officials of those ministries and departments guilty of pollution, of course, but by the broad masses of the people and the press. Nowadays the situation has changed. Reproaches and rebukes such as the following have begun to pour in: Here now, they say, some plants have been shut down, and so we are left without the most necessary things. By that logic, the guilty parties are not at all those persons who designed and built enterprises whose discharges strew a powder-like dust on our windowpanes. Have they ever thought about technologies or about purification facilities? Let's just cut some more red tape, and let's build communism further. And if children are literally dying off in the industrial zones, let them burn with a bright fire....

By the way, those persons are mistaken who think that it is only in our country that informals-ecologists are so "unruly." Two months ago the Social-Ecological Union conducted a large Soviet-American Conference; it was participated in by representatives of 40 organizations from "that" side and by more than 100 from our side. It became clear that the representatives of the world where capital reigns have been fully able to give this matter a broad start. They have created excellent data banks regarding harmful production facilities, their effects on people's health, and technologies (whether they are "dirty" or "clean"). The Americans are prepared to offer detailed information to the Social-Ecological Union, and nowadays this is extremely topical and urgent for us. It is, of course, absurd to see a spy in all foreign firms who is striving, at all costs, to pollute the Russian land. But it never hurts to know how they deal with things.

Members of the Social-Ecological Union have no membership dues or "official" duties. However, they do have a few more rights than ordinary citizens. Thus, they can implement controls on the state of the environment, as well as natural or cultural treasures. Union members also have the right to keep track of whether the laws related to the use and preservation of the environment are observed. Their reputation among polluting-enterprises (as "fanatics," etc.) confirms the fact that they are extremely active in exercising their rights.

For those persons who want to help this union in some way or share information with it, the address is as follows: S. Zabelin, Apartment 85, Building 25, Krasnoarmeyskaya Street, Moscow, 125319. That is the organization's official address.

### **Moscow's Losinyy Ostrov National Park Threatened by Development**

91WN0615A Moscow KOMSOMOLSKAYA PRAVDA  
in Russian 9 Jul 91 p 2

[Article by S. Vishnevskaya: "Will Tracked Vehicles Consume the Island? How They Are Turning a National Park Into a National Vegetable Garden"]

[Text] Defenders of the national park, of course, students and school children, quite recently gathered under the linden and pine trees, worked without sparing their hands or young feet, and later sang along to a guitar and recited poems.... With fire in their eyes, the volunteers, who have been summoned by the epoch, discussed the fate of nature. There are hands, head, and heart, there are thousands of persons holding similar views, there are those reliable assistants and educators like Nikolay Fedorovich Reymers, those Danko's of ecology and Esperanto like Leva Medvedev.... What else do you need?

Come to Losinka right now. It is quiet and empty in the national park. A newspaper, full of "glasnost that is crying out in the desert," is protruding from a refuse container but neither the clatter of shovels, cheerful voices, nor the strumming of a guitar are heard.

Did the music not play for long? Did the volunteers become tired? Has the ecological movement fizzled out?

But arm yourself with patience and, what is better, with transportation and, it is desirable, with any sort of tranquilizer (Russian State Committee for the Environment First Deputy Chairman L. Shelest also said: "This may be reduced to a heart attack"), and let us see what is being done right now on the periphery of the national park.

You catch sight of State Timber Fund trees, mighty and beautiful, which lie on the ground, toppled and maimed by some mindless axe, not mindless but very prudent.... Here they suddenly begin to blaze—in the entire sky—flames from the pine trees in the prime of life.... A wasp, attracted by the honey odor of the still living wood, circles over the fresh slivers.... Metal tabs have been fastened to the living trunks....

A peaceful Soviet tractor, one, yet another, and yet another, hums at the other end of Losinka.... A "labor battle" is occurring to dig up the new forest that the public planted last autumn (the last burst of free labor in the national park)—the only one in the Moscow area during the entire last 40 years. Already the entire future forest is under the tracked vehicles. The people also said: "Replow it—and you will get your plot." Who said that? You cannot find the sources. Just like in Vilnius. There the tracked vehicles crushed people, here they are crushing other small lives. Naturally, the replowing began right after the well-known lightning-fast decision of the authorities to provide gardens "to all who desire them at the expense of any land users." Do you hear? Any!

This is ecology on Losinyy Ostrov. You know someone is abandoning all of this—all of these volunteers of lawlessness.... When Losinka's director approached Boris Nikolayevich Yeltsin with nearly a scream for assistance at the Congress of People's Deputies a year ago, Yeltsin reasonably answered: "Wait a bit. We need to seize power." Power has been seized. Russia's time itself will save what now remains of its nature. And not only on Losinyy Ostrov. Baykal.... Samarskaya Luka.... Sochi National Park.... Mariy Chodra.... Valday.... Everywhere—it is the same.

And without the Finns, we all knew that there are many harmful compounds at Losinka and that they exceed the maximum allowable concentrations by tens and hundreds of times. But the Finns who arrived in Moscow at the invitation of the energy industry to render their verdict on the infamous Northern TETs [heat and electric power plant], to dot all of the i's which we possibly did not raise our hands to do. They perhaps would also construct the Northern TETs (indeed, after compliance with the additional conservation measures advanced by them). But in their view, that is not the matter. And without it, Losinyy Ostrov will not withstand that man-caused press that crashes down on this never coddled regal forest area on a daily basis. First of all, the pine tree will go away. The spruce. Then the oak and the linden.... All of this that is not beyond the mountains. Maybe we can save the beech. But it also does not have many chances.

### New 'Ecologically Clean Power Production' Technology Patented

*LD1108212391 Moscow Radio Moscow World Service in English 1900 GMT 11 Aug 91*

[Text] Soviet scientists have patented a principally new technology of ecologically clean power production without burning either organic or nuclear fuel.

The project is based on the principle of using the most powerful natural energy phenomenon, the tornado. A typhoon created in a giant cone-shaped structure rotates blades of a turbine with an electric current generator.

Military laboratories in several countries have been trying to reproduce this phenomenon.

### PRAVDA Series Examines International Chernobyl Project Findings

*91WN0581A Moscow PRAVDA in Russian Second Edition 5, 6, 8 Jul 91*

[Article in three installments by Vladimir Gubarev: "Portrait of a Catastrophe: Reflections on the International Chernobyl Project"]

[5 Jul 91 p 3]

[Text] A squall of rumors, conjectures, and denials has arisen over the cities, villages, and settlements and over the many hundreds of thousands of people who were affected by the Chernobyl disaster. And once again there have appeared on the stage the prophets, unmaskers, and truth-seekers who claim that only they are protecting the people while the rest, including the international community, are trying to destroy them.

Reason sleeps and so a mother does not know what awaits her child, old people do not know where they can live out their remaining years, and men lose heart out of helplessness, while women's tears, most often unseen, can no longer relieve their minds and hearts. Sorrow and pain... They alone hold sway over people, because people do not know what will happen tomorrow and it seems that nothing can bring them peace.

The Chernobyl world needs help, help rather than ringing phrases. A person must see the outlines of the future; it may be a harsh one but it must be clear. And then strength and courage come to him, for without them he cannot overcome any misfortune. So what really helps on this path?

No, not fear, but knowledge and sober calculation. And that is precisely what the findings of the International Chernobyl Project, a project which is now under fire from many to whom "Chernobyl" is just a word, not life, provide.

But I want to caution you right away: we face a difficult path to cover the thousand pages of the report by the International Consultative Committee, and not all arguments and findings may seem convincing. Some will astonish and, moreover, involuntary protest will rise up.

But we should fight our way through all these thorns, because, perhaps, for the first time a portrait of the most serious nuclear catastrophe in the history of civilization has been created.

#### A Matter of a Million Dollars

A press conference was held in Kiev. Its participants had just flown in from Vienna where the results of the work on the International Chernobyl Project were discussed.

One of the journalists wanted to know: "How much did this expert investigation cost?"

This is the answer that followed:

"Mention was made at the conference in Vienna that the Soviet Union spent a million dollars. The participants in the study spent the same amount of money."

So, a million dollars.

The follow-through seems extremely simple. A million divided by 200; each of the experts gets 50,000 [sic], quite a large sum even for a scientist who is known throughout the world, and the expert who has been "helped out" is ready to write any conclusion.

"The IAEA [International Atomic Energy Agency] has been bought by the Soviet Government."

"Hans Blix—the Herald of the Soviet Atomic Monster."

"Atomic scientists of the whole whole have united against us."

No, these headlines are not from the West's yellow press; unfortunately, they are from our domestic press. There are dozens of similar slogans, headlines, and quotations in my journalist's file.

If only they were merely newspaper "slaps in the face"! What kind and grateful feelings Robert Gale was met with five years ago in Kiev, which was petrified because of radiation. And when he brought his children there it shocked many people: most Kiev leaders had tried to send their children away from the city by fair means or foul. And now, five years later, that same Robert Gale sees a shoe flying toward the side of the stage where he is standing. That is how effectively one of the listeners expresses his protest—do you see; the American doctor is not saying what the owner of the shoe wants to hear. Excuse us, Robert! Let that same kindness that has been living these past years remain in your heart and do not let the pain which does not let go of your heart abate; forgive us sinners. And as you do that, accept that very man who hurled the shoe, if he becomes ill, into your clinic. But God grant him good health; there are enough sick people, including those whom you are treating free of charge.

No, Robert Gale was not the only one to know a moment of humiliation. Obviously, human nature has not completely rid itself of baseness, although people say that tragedy purifies. Not everyone. Not everyone.

Remember something else, Robert! We stood near the stage in the Cinema Center and recalled the first, incredibly difficult days of May 1986, and all around people were waiting for our talk to end. Each of them wanted to say something good about the film "Chernobyl: The Last Warning," which Muscovites had seen for the first time and in which you are the main hero. Suddenly a young fellow fought his way through this wall of people and tears were in his eyes. He embraced us and then began to laugh and then cry again. You saved his life and he regained his vision—his eyes saw the world, the real one and the one presented in the film in which even he was assigned a role—a sad, bitter but truthful one. He was a fireman, one of those who shielded the planet from the nuclear fire and who fortunately survived with your help and recovered his sight.

From the Project documents: "Members of the International Consultative Committee express their gratitude to the numerous participants in the most diverse measures carried out within the framework of the International Chernobyl Project."

The International Consultative Committee is made up of a constellation of the most prominent scientists and specialists assembled within the Project from all continents. It was headed by I. Shigematsu, the director of the radiation consequences fund of Hiroshima. M. Rozen, a representative of the International Atomic Energy Agency, became the deputy. Among the members of the Committee are L. Anspew from the Laurence Livermore National Laboratory (United States), B. Bennet from the UN Scientific Committee on Effects of Atomic Radiation, G. Kolpe from the International Bureau of Labor, R. Kulon from the Atomic Energy Commissariat of France, F. Fry from the National Council on Radiological Safety of England, J. Jovanovich from Manitoba University in Canada, and N. Kelly from the European Communities Commission. I am cutting off the list of such well-known names, but not at all because the others do not merit mention or have made less of a contribution to world science than their colleagues; it is simply impossible to list all the members of the committee and the experts. There are about 200 of them and each is known in the world community. But those already named not only attest to the quality of the work done but also blow to smithereens the extremely popular notion that the expert investigation in the Chernobyl zone was done by the IAEA. That is not so. The Agency coordinated the work, but it was carried out by practically all the international organizations belonging to the UN system. And the IAEA essentially could not influence the specialists' findings; moreover, the Agency was just as interested as we were in the findings of the Consultative Committee in order to plan its work. It is completely natural that Soviet specialists were also part of the Committee; they included representatives of the Ukraine, Belorussia, and Russia, as well as the State Committee To Clean Up the Consequences of the Accident at the Chernobyl AES [nuclear electric power station].

There is a science fiction story called "Two on the Moon". By Ray Bradbury, I think. Anyway. Two people fly to the moon and work at a station there. They have no communication with Earth. Some time later they return. They

come out of the ship and fall on their knees—they are still six times heavier here. A close-up on television shows their eyes and all the inhabitants of Earth notice that they have a special look in their eyes as if the two of them had experienced Something incomprehensible and inaccessible to us earthlings.

The same thing happened in Chernobyl. In the first days after the accident we looked into the eyes of the nuclear devil. Thousands of people did not become frightened and began to fight him, and they won. So how could they be afraid now?! "Chernobylites" are special people who know Something, and so it is impossible to frighten them and make them keep silent. No one can do it, even if all the presidents of the planet were gathered together, with all their power. They are infinitely sensitive to only one thing, the pain which lives in each one of them. And this pain helps protect the helpless, the dim-witted, the young, and the old—everyone who must deal with the atomic devil every minute. They include babies, old people, women, fox-cubs, streams and plowed fields, forests and abandoned hamlets—all that other world which against our will and desire and out of nothing but folly and irresponsibility was created after April 1986 on an enormous territory of the country. And that is not only our Big Motherland, which people customarily say now, but the Small Motherland too, because our relatives and close friends live in a tiny hamlet not far from Mogilev. Before we often remembered the war and talked about the partisans and the punitive expeditions, but now it is always curies per square kilometer, rems and roentgens, gamma radiation, and radioactive cesium.

We followed the work of the experts closely. And not just when they went to the contaminated zones, but also in their laboratories in Austria, England, the United States, and France. And our correspondents were always given full cooperation; for the whole sense of the International Chernobyl Project is, in fact, its glasnost, notification of the broad public, and cooperation with all interested organizations. And what is more, the Project is divided into three parts itself. The first is the technical part; it takes up about a thousand pages. In it any specialist from any country will find everything he is interested in, from methodologies to a particular experiment or study. The second part, "Evaluation of Radiological Consequences and Safety Measures," is intended for managers of various ranks and orientations, as well as for all those interested. And finally, the third part is intended for all the people in the contaminated regions. It is a brief and very intelligible analysis of the situation. In my opinion, the experts of the 25 countries did what we were supposed to try to do several years ago. At least what was within our powers.

And now, the million dollars. No, I have not forgotten about it. So, was the labor of the 200 highly skilled specialists from 25 countries worth a million dollars?

**V. Gubanov, the leader of the USSR delegation in Vienna:**

"The cost of the work was at least twice as high. The government allocated 1.5 million rubles to implement the program. That involved paying for the experts to live in

our country as well as transportation costs—they came in on Aeroflot planes. The expenditure part of the program was appraised in Vienna, and we do not know about it. The statement was made that the participants spent 1 million dollars directly. Plus about a million was spent on equipment: the expert study was conducted with the latest scientific equipment, which would be difficult to find even in the most progressive clinics. In this way, the total cost in hard currency announced at the conference was estimated to be 2 million dollars.

"The most prominent scientists of the world came to our country during their vacations and did not demand money for it; moreover, they often paid for the equipment and for conducting the experiments themselves. On the whole they spent about 2 million dollars. Essentially they gave it to our country. And instead of thanking the scientists, some of our fellow countrymen try to accuse them of venality. And another thing: we may agree with their recommendations and findings or not, but we simply must be grateful to them. Is that not so, Viktor Afanasyevich?"

"Most certainly."

"Incidentally, I cannot recall anything like this in history. Has such a large-scale project existed before?"

"Opinions at the conference in Vienna on this question were unanimous: this project is unprecedented. Both in terms of the nature of the work, and in terms of the constellation of scientists who took part in it."

**The opinion of Itsuzo Shigematsu (Japan):**

"Within the framework of the project groups of experts used their collective experience and knowledge to separate facts from erroneous opinions and the impact of radiation from factors unrelated to radiation. A large amount of data was obtained and studied in order to understand the existing situation and draw conclusions regarding future steps which will possibly have to be taken to alleviate the consequences of the Chernobyl accident. Only time will enable us to assess the real significance of our contribution."

**A 'Hot' Cloud**

Experts of the International Chernobyl Project recreated the chronicle of the accident's development.

From the Project documents: "Early in the morning of Saturday, 26 April 1986, an accident which was fated to have global consequences occurred in the fourth unit of the Chernobyl AES (UkSSR). Several seconds after 0123 hours (Moscow time) two explosions one after another ruptured the roof from the building of the fourth unit. Concrete, graphite, and other debris were expelled through the hole that had been formed and the active zone of the reactor was exposed. Smoke and steam with a large quantity of radioactive material formed a 'hot' cloud which rose to a height of up to two km and then passed over the western regions of the USSR in the direction of East and West Europe, and with much less density—over the entire Northern Hemisphere. Heavier debris and particles fell near the site of the power

plant, but the light particles were carried away to the west and north of the plant where they fell in adjacent regions and the neighboring Union republics."

I want to direct your attention to the "two explosions." This fact was one of the main stumbling blocks in those first days of the accident. In my second report from the emergency station, I had written about an explosion, and the mention of it caused a sharp reaction among various leaders. For during the first week a great many people asserted that there had been no explosion at all!

And if we try to figure out why our country did not inform the world community about what had happened for several days, one of the reasons was the distorted information coming both to the government and to the Politburo. The leaders of departments and atomic specialists for a long time did not want to admit what was obvious, namely that the reactor had exploded.

From Project documents: "Many Soviet experts in the nuclear field considered an explosion of this type impossible and initially did not believe the reports of the workers who were in the fourth unit building on the destruction of the active zone. The operators continued to release water into the reactor building, trying without success to cool the active zone."

The document presented to the international community does not examine the course of events at the Chernobyl AES in detail. The experts, in my opinion, provided the right focus: they direct attention to those problems which complicated understanding of the scope of the catastrophe.

But first let us turn to the meeting of the USSR Supreme Soviet.

From the stenographic report:

**K. Masik**, the first vice premier of the Ukrainian SSR Cabinet of Ministers: "The party directly to blame for the catastrophe is the Union department, not the peoples of the republics which suffered."

**V. Belov**, the secretary of the governing board of the RSFSR Writers' Union: "The creators of the mongrel atomic technology sat calmly during the deadly 'Chernobyl storm,' which even now, five years later, has not abated, and when it will no one knows. The real Chernobyl consequences are being concealed as carefully as possible by such people as Izrael and Guskova, Ilyin and Knizhnikov, who armed themselves with international support (IAEA shamefully supported all these atomic energy figures)."

I cited both the quotations for only one reason: they are typical of sentiments in society today.

The leader of the government of the Ukraine asserts that everything is clear—who is guilty and who is a friend, and who is an enemy.

The desire to divide responsibility—or rather irresponsibility!—into two parts and choose for oneself the one which is more suitable at a given moment; that is certainly

one of the reasons for the catastrophe in Chernobyl and one of its lessons which we have just not learned in the last five years.

No, this is not a position nor the ability to manage effectively; it is only playing at politics which tomorrow may become a new catastrophe.

With all responsibility I assert that in those days of April and May 1986 the leadership of the Ukraine not only was afraid to make any decisions at all, but even promoted (involuntarily, of course) the development of the accident. And in full measure with the Union departments it bears responsibility for what occurred. And that includes what happened at the Chernobyl AES long before the catastrophe.

"None of the firemen had been taught to fight a fire given contamination with radioactive materials."

"The rescuers, firemen, and operations personnel on the whole had no idea how serious the risk of radiation was. The available dosimeter equipment there did not allow them to measure such high levels of radiation."

"There was not enough equipment and means to fight the accident. The emergency brigades did not have individual dosimeters and the surrounding area was not equipped with automatic dosimeter monitoring posts."

"The leadership of the civil defense forces pointed out possible shelters and suggested to the Ispolkom of the Prip'yat City Soviet of People's Deputies that they inform the population by radio of the radiation danger, but this was done only on the Sunday right before the evacuation."

"The civil defense personnel did not put on respirators until after the evacuation, since they did not have enough even for the children. The city park of culture and recreation had been reopened only a few days before the accident, and there were a great many people there. There were no official warnings or instructions on the need to be in enclosed spaces nor was planned distribution of potassium iodide tablets organized."

It is common knowledge that before April 1986 the Chernobyl AES enjoyed the "favor" of the bosses. And distinguished guests were brought there and the republic's leaders liked to hold party and economic aktiv meetings there and found jobs for "their own people" there—it was nice to have Kiev close by; they took them to task for disruptions of the plan and wrote out reward sheets. Incidentally, this procedure was used even after the accident, nor did they forget themselves. But let it go, let the past go. All the same I do want to mention responsibility.

So, five years have passed since Chernobyl. The mistakes and errors are well known. Among them are those which the republic's government and the local organs are responsible for. But there is only one thing I fear—nothing along these lines has been done at the other nuclear power plants in the republic. And the shortcomings which the International Chernobyl Project correctly identified have not been corrected—letters which lie on my desk regularly attest to that.

I was a witness to how "those responsible for atomic energy" in the Ukrainian CP Central Committee and the Council of Ministers of the Ukraine in 1986 asked to be "told in everyday language about radiation, about rods, about graphite, and about uranium." And then they spent a long time expressing gratitude for the lecture. Has nothing at all changed?!

It is for that very reason that I put the two statements by K. Masik and V. Belov at the session of the USSR Supreme Soviet together. Perhaps the writer should not be blamed for being out of his field, but it was necessary to call for restraint.

Guskova is also on the list of names which resounded from this lofty podium. But we should kiss her radiation-exposed hands and kneel down to her!

I am not going to hide it: my relations with this doctor are complicated: somehow she gave it to me at the House of Scientists for the play "Sarcophagus." She spoke insultingly and not always fairly—Guskova has a stern character, that is how she was born. But she has to her credit the highest professionalism and lives saved. The lives of those very fellows who shielded humanity from the nuclear fire.

**From the Project documents:** "Less than an hour after the start of the accident, the first case of acute radiation sickness was noted. Clinical manifestations of radiation exposure or burns were found in 203 of the people who had been at the reactor site early in the morning of 26 April."

For the information of V. Belov and others: it was extraordinarily complicated, and perhaps even impossible, to chose precisely those who first of all should go to a specialized clinic from among the hundreds of people who had no dosimeters and no data. But Professor A. Guskova's group did its work without mistake. Moreover, the doctors did not wait for any orders or instructions "from on high"; they flew in, chose those who had suffered most seriously, and took them to Moscow. And if it were not for their ability to assume responsibility and if it were not for their highest professionalism, the lines could have been much longer. Yes, the doctors were helpless when a person received five-six fatal doses, but they returned to life some who by all laws of science should have died twice. And that is not emotionalism, nor is it resounding talk; it is a fact.

We will speak more of the role, mistakes, and omissions of the institutes and institutions which Ilyin, Knizhnikov, and Izrael head. Many pages are devoted to them in the International Chernobyl Project, but for now we should mention something else.

The accident at the Chernobyl AES occurred for many reasons. Some of them have not even been studied yet, but one thing is certain—it became a symbol of the unprofessionalism which has permeated our society in all areas. We encounter it everywhere, at all levels, when we try to analyze the prehistory of the catastrophe and its development. But in struggling with the consequences of Chernobyl, unprofessionalism is many times more dangerous—

for we are speaking of the fates of thousands of people who are living today and of millions who will live in the future.

It is much more difficult to get out of a labyrinth than to enter it. We have become fairly lost in the Chernobyl labyrinth. I am certain that we will not be able to get out without professionalism. We should of course have a critical attitude toward their proposals, but we must listen and trust. It is like trusting the pilot of a plane: medical checks are certainly necessary before the flight, but once you have taken off, all hope rests on the pilot—only he can bring the machine to its destination.

**From the Project documents:** "The accident in Chernobyl had social consequences unprecedented in the history of industrial society. Early consequences led to the evacuation of more than 100,000 people and affected the fates of hundreds of thousands of people who were part of the emergency brigades. An enormous part of the population of the Belorussian SSR, the RSFSR, and the Ukrainian SSR continue to live under stress and with a feeling of alarm because of continuing uncertainty about the future. International cooperation in applying an increasing amount of humanitarian and scientific effort will be an important element in the measures focused on completely overcoming the consequences of the Chernobyl accident."

[6 Jul 91 p 3]

[Text]

#### A Third Attempt?

Gradually Chernobyl is turning into the Land Beyond the Looking Glass, a country which has its own operating laws and principles.

I remember how much work was needed to get the red pass where it was written laconically: "Passage on foot and by vehicle anywhere." Such a document was necessary for work in the "zone." It had to be presented often: when entering the 30-km zone, and then—the 10-km zone and at the power plant site, at the administration building, at the first and second units, and at the third separately, and then right next to the "sarcophagus."

That is how it was.

But today a hundred dollar bill is becoming the "pass." But what am I saying!—the "Price" has doubled, and some "services" are much more expensive.

**DER SPIEGEL confirms:** "Representatives of the Western media can no longer visit Chernobyl without paying 'tribute' or 'duty.' The California firm Multi-Entertainment Holdings got all rights to the sale of the photographs of Chernobyl and is charging a pretty good price for them. A helicopter trip where you can record this colossus on film costs 800 dollars."

Your reason refuses to understand what is happening.

Hundreds of dollars to visit the "zone," while at the same time thousands of Belorussian, Ukrainian, and Bryansk



boys are flying to Germany, Norway, England, and Australia, where they are invited for the summer.

The owners of the "zone" hope to sell some of the radioactive waste to Western scientific research centers, while at the same time the International Chernobyl Project experts, little concerned with their health, travel along the dusty roads of the Gomel region.

The "Land Beyond the Looking Glass" of Chernobyl appears in the fact that new, mysterious, and unexplainable distortions are being imposed on the moral, psychological, and economic distortions which are inherent to the country as a whole. I cannot understand how many dollars pain and grief are appraised at. How much do the tears of a mother and child cost?

There are legends that supposedly radiation creates monsters. They include gigantic mushrooms and cucumbers, calves with five legs, pigs without ears, freaks. These legends appeared long before Chernobyl, but their flourishing in luxuriant color certainly came after it. Nuclear monsters from science fiction, ignorance, and conjectures have taken on real outlines. They have jumped from the pages of not very conscientious newspapers and begun to wander among people who are unable to separate truth from fiction. They simply do not understand anything in radiation but are forced to live with it. Are they really to blame for that?

Ignorance has crowded out Knowledge in Chernobyl. Science has begun to be replaced by mysticism and pulp writing. Unfortunately, this process has been facilitated to a considerable degree by people who have learned titles but nothing to do with physics, radiation biology, and medicine.

It was precisely in such an atmosphere that the experts of the International Chernobyl Project began their work.

In October 1989 the USSR government appealed to the IAEA to conduct:

"... an international expert investigation of the concept formulated in the USSR of people living safely on territories which were subjected to radioactive contamination as a result of the accident at the Chernobyl AES and an evaluation of the effectiveness of measures to protect the people's health which are being conducted in these regions."

Hans Blix and his associates faced a difficult problem: should they accept this proposal? The prestige of the IAEA was always high both among physicists and among governments. The inspections, expert studies, and monitoring of the agency are a guarantee of high quality research, and at the same time it is precisely the IAEA which is carrying out a most difficult task: monitoring the nonproliferation of nuclear weapons.

After the accident at Chernobyl the situation changed somewhat. Above all because of the powerful attack on the IAEA by opponents of atomic power. Moreover, even the agency itself had to review its positions—it was undeniable

that before this most of the specialists could not have imagined that such a large-scale accident was possible in an atomic reactor.

The Soviet Government's proposal for an expert investigation forced the most important international organizations to unite—what is more, the nature of the catastrophe at Chernobyl demanded it.

There had already been two attempts to organize an investigation by international experts. In June 1989 a group of experts from the World Health Organization (WHO) worked in the USSR. In early 1990 experts of the League of Red Cross and Red Crescent Societies arrived in the catastrophe zone.

**From the report of the WHO experts:** "... the scientists, who did not have a great deal of experience in the field of the consequences of radiation, explained various biological and medical aberrations as the result of radiation. These aberrations cannot be attributed to radiation exposure, especially when the normal level of incidence of disease is not known, and it is most likely that they are the result of the impact of psychological factors and stress. The fact that these aberrations are explained by the impact of radiation not only helps increase the psychological pressure and provokes additional stress impact on the people's health, but also undermines faith in the competence of the specialists in radiation safety."

The experts of the League expressed a similar conclusion.

There was no need to wait long for the outburst of dissatisfaction. Certain Soviet scientists significantly promoted this too. Yes, they quite accurately made the "diagnosis" and the findings of the foreign specialists to a certain degree confirmed their data, and so the main and determining thesis became: "Radiation has no significance, radiophobia determines the state of the people's health." Oh, how we love extremes! If something is not white, it must be black. And it is difficult to really convince people that the truth lies somewhere in between, that you just have to find where that is exactly. But in the clash of emotions we began to forget about the truth.

**From the stenographic record of the meeting of the USSR Supreme Soviet.**

**I. Smolyar**, chairman of the Belorussian SSR Supreme Soviet Commission on Problems of the Chernobyl Catastrophe: "There are certain specialists of the Ministry of Health who are simply assessing the situation incorrectly. But the actual data suggests that the incidence of disease in this zone has increased by one-third and continues to increase."

**V. Yavorivskiy:** "Heaven help us if something more happens. This time, forgive me, we will not find fools to go there. I am talking about people who became disabled right on the spot."

**V. Doguzhiyev:** "We are doing our job and deciding questions on a professional level. Emotions belong elsewhere. Comrade Yavorivskiy has no arguments. So the best argument is to shed a tear and show yourself to be a protector of the people. All of us who are working on the Chernobyl problem have done no less for the victims than Comrade Yavorivskiy. I cannot sprinkle ashes on my head

and say that we are so-and-so's. Everything which depended on us we have done, and we have twice reported to the Supreme Soviet. So reproaches that someone is pinching pennies is an improper populist trick."

The leader of the Soviet program to clean up the accident at the Chernobyl AES, V. Doguzhiyev, though he has a reputation as a "man with nerves of steel," all the same is not always able to keep his feelings in check—the attacks on himself he has to endure are too massive. No, not constructive talk, but precisely bold cavalry raids. Incidentally, the IAEA is regularly mentioned in these "battles," and naturally in a negative context.

I think that the only possible solution has been found—to unite under the aegis of the Project:

the European Communities Commission (ECC);

the United Nations Food and Agricultural Organization (FAO);

the International Organization of Labor (IOL);

the UN Committee on the Effects of Atomic Radiation (UN CEAR);

the World Health Organization (WHO);

and the World Meteorological Organization (WMO).

A group of 10 scientists arrived in the regions which suffered. They not only met with deputies, their own colleagues, and leaders of various ranks, but also and above all with the residents of the seven populated points in the three republics where they proposed to work.

From the Project documents: "The main subject of discussion was anxiety over the health of children and concern regarding the effectiveness of the measures proposed by the government to limit the impact of radiation over a person's lifetime. All this occurred in an atmosphere of the population's distrust both of their own competent organs and of many representatives of scientific and medical circles."

The first week after the accident went down in history as the "week of lies." Unsuccessful attempts initially to hide what had occurred in Chernobyl and then to diminish the scale of what had happened, deceive people, and not tell them the truth, thereby hoping to calm them, all lay like a dark stain not only on the country's highest leadership and the leaders of departments but also on all domestic science. Unfortunately, many scientists who had been specially clothed with power were unable to assume the blame and tried to lay the responsibility on others; in short, in this situation they behaved according to the "Me first" principle. Science was deprived of the most important thing—trust in it. And now it is extraordinarily difficult to get it back; most likely that will take many decades. This great fault of science lay like a shadow on the generations, because mankind will never forget the tragedy of Chernobyl.

"A discussion with the population" of the most complex scientific problems? It sounds unusual to our ears, does it not? I cannot recall a case where the associates of the

Atomic Energy Institute or the Biophysics Institute "discussed with the population" the construction of a new reactor or research in the region of Novaya Zemlya after a series of nuclear tests. A great deal of what we are encountering after Chernobyl is hidden here!

The practice of world science means broad discussion with the public of all problems involving nuclear power engineering. It is not without reason that there must necessarily be "information centers" at all nuclear power plants, for example in France or Japan, where anyone who wants may learn about the work of the AES, speak with specialists, or discuss particular problems. And even now such centers in France rival the Loire castles in terms of the number of tourists. And in Japan the construction of any nuclear facility begins precisely with these centers.

Fortunately, the situation in our country as well is beginning to change little by little. Scientists and specialists understand that today it is impossible to develop nuclear power if the population does not give its okay; otherwise spontaneous rallies occur, roads leading to the AES are blocked, and construction projects are frozen. Agreement between science and society is necessary. Unfortunately, we began to understand this only after the tragedy in Chernobyl.

From the Project documents: "Doing work within the 30-kilometer forbidden zone and around the most damaged reactor was not part of the Project's task, with the exception of describing measures to localize the accident in the early stage. The Project deals only with the radiological consequences of the accident for people who lived in these regions at the moment the evaluation began in 1990. According to official data, the population of the regions which suffered was roughly 825,000 people, and of them 45 percent lived in the Belorussian SSR, 24 percent—in the RSFSR, and 31 percent—in the UkSSR."

In 13 of the country's rayons, the level of contamination with cesium-137 exceeds one curie per square kilometer; unfortunately, we are still using the old units of measurement, the international system of units (SI) is not yet applied. 25,000 square km have a cesium level of more than five curie per square km, and of them—14,600 are in Belorussia, 8,100 are in the RSFSR, and 2,100 are in the Ukraine. It was precisely in these regions where the experts worked.

Recently a heated argument has developed regarding who suffered most as a result of the accident at the Chernobyl AES. The Belorussians claim that it is precisely their republic, the inhabitants of Bryansk area lament that they are forgotten, and the Ukraine insists "on its priority, since the Chernobyl AES is located on their territory." It seems to me that the principle of dividing the territory by nationality is inappropriate; it is an enormous misfortune for the entire country. And if one of the main mistakes of the past years of perestroika is analyzed, I am certain it is that right after the catastrophe we did not declare the Chernobyl tragedy a nation-wide disaster with equal bearing on the residents of Central Asia, and the Baltic Region, and the Transcaucasus.

One of the greatest services of the International Chernobyl Project is the lack of "boundaries" in the research. Yes, the documents constantly mention all three republics, but for the experts what language was spoken by the residents among whom they worked had no significance.

Cities, settlements, and villages were chosen by agreement with the local organs. Some of the populated points were located in the "zone of strict control," while in others the level of contamination was relatively low but their residents may have gotten a high dose of radiation during the first period of the accident. At the same time "clean" regions were chosen for the international expert investigation.

Bragin and Veprin, Narodichi and Novozybkov, Gomel and Savenki, Malozhin and Khoyniki, and many others, on the one hand, and on the other—Kirovsk and Unecha, Surazh and Khodichi, Krasilovka and Chemer.

**From the Project documents:** "The desire of the population of the regions which suffered to obtain practical information on how they should act in the particular radiation environment was mentioned. The international experts came to the conclusion that the population of the contaminated regions has a poor idea of the basic scientific principles of radiation and its consequences (that, incidentally, is characteristic of all countries of the world), which was a reason for the many medical and social problems which exist."

Two hundred experts from 25 countries and seven international organizations made 50 trips to the USSR. Laboratories in six countries did the selection and analysis of samples. The governments and private companies of five countries offered equipment and materials, dosimeters, and computer time. All the experts and the research in the 14 laboratories of the world were presented to the International Chernobyl Project free of charge, on a voluntary basis.

#### Particle 'Rain'

"Five years after the nighttime explosion in the fourth unit, everything looks like war rolled through the plain located between Pripjat and the Dnepr," that is what the journalists of DER SPIEGEL write.

In May 1986 I wrote a report entitled "The Nightingales over Pripjat." There were a lot of them that lavish spring; at night they sang so clearly that the soldiers could not fall asleep. Those very soldiers who had returned from the accident unit. And I ended the report with a line from the well-known military song: "Nightingales, nightingales, leave the soldiers alone." The editor crossed out this comparison with war then, in 1986: he said making the analogy was inadmissible.

During the war one out of four people in Belorussia died.

The Chernobyl catastrophe affected one out of five.

Nowadays the nightingales do not sing over Pripjat. They have disappeared somewhere. They have been replaced by iodine-131, cesium-134 and cesium-137, strontium-90, plutonium-239, and plutonium-240, all that radioactive

rain which erupted from the reactor and scattered in various directions. Moreover, there was other highly active debris of the fuel—"hot" particles which penetrated the lungs, the stomach, the eyes, as bullets used to penetrate the human body.

For 10 days the wind and the rain spread the "dirt" around Belorussia, the Ukraine, and Russia. It was chaos, because there were no patterns to the radioactive fall-out. The elements ruled. Because of the heavy rain and the particular features of certain rayons, "hot spots" formed where the potency of the dose was 5,000 times higher than the natural level.

Complete maps of contamination with cesium, strontium, and plutonium were first published in 1989. By that time iodine-131, which had "attacked" the thyroid glands of many hundreds of thousands of people, had already decayed and disappeared.

We published maps in PRAVDA three times, first in 1989.

"How close to reality are they, are there any distortions?" I asked Izrael.

"Here are the data which we have," answered the chairman of the USSR State Committee on Hydrometeorology and Monitoring of the Natural Environment.

As is common knowledge, right after Chernobyl Yu. A. Izrael was criticized bitterly: he was accused of hiding the scope of what had happened. I worked together with him and his associates: I know that the governmental commission received all the information which could be obtained in the particular stage of the work from the state committee. I know that this information was brought to the attention of the leaders of the country and the republics. It is something else again why it did not reach the rayons and cities. Or rather, why it reached those places, but lay in secret safes.

"New spots" appeared on the new maps—in 1990-1991. That is not because they were not discovered before; unfortunately, there was a certain variability in activism and, what is more, the instruments became more precise.

One of the first questions directed to the experts of the International Chernobyl Project sounded like this: "Did the official maps reflect the actual level of surface contamination?"

The experts not only analyzed the official data and became familiar with the 20 state institutions and laboratories where the samples were studied, but also conducted their own research. They used independent methods and equipment to determine the radioactivity on the surface and in the soil, the air, water, vegetation, milk, and food products. Control measures in "clean" populated points were conducted at the same time.

The specimens were sent to six countries. And they were "anonymous"; that is, the associates of the laboratories did not know exactly where the samples came from.

It was a surprise to many experts that we have a well developed infrastructure for evaluating radioactivity. I think that is a kind of revelation for my fellow countrymen too; for we have become accustomed to the idea that there are shortages of everything in our country. But it turns out that the aerial dosimetric monitoring which began to be conducted right after the accident is now done twice a year. The central data base is enormous. It is in Obninsk. Each republic has its own data base. A very widespread network for monitoring the quality of food products exists.

No, it cannot be believed!

The experts worked for six months. Anonymous samples of soil, dry milk, and vegetation came to the laboratory in Zeibersdorf.

**From the Project documents:** "The results presented on the content of cesium-137 in the soil agreed well with recommended values. On the other hand, the results on strontium and plutonium showed a trend to overstate their content in the soil (by a factor of up to four). Such a trend to overstate estimates was noted when determining the content of strontium (up to a factor of 10) and cesium (up to a factor of three) in milk."

The experts conducted 2,000 measurements in Bragin, Novozybkov, Poleskiy, and Daleta. The samples were also examined for the presence of radionuclides.

Why do the data on strontium and plutonium differ so much?

**Academician S. T. Belyayev comments:**

"No matter how strange it may seem, there are no mistakes. On the whole the great skill of our specialists was confirmed. But the international experts did not take into account certain national characteristics. In our own measurements we oriented ourselves to the maximum indicators. For example, in a room is one thing and on the doorstep of the house is something else. But do you spend much time right on the doorstep? The experts take the average value, while we take the value at the doorstep of the house, if it is greater there. Or the ground. The school yard. Kids are always there and if there is a "hot" place there, we have reason to take it. But the experts believe that is wrong—they work with the average values."

"But all the same the variation is too great!"

"I agree. Unfortunately, the attention of many people who are not specialists has been drawn to Chernobyl. And they all are involved in measurements. In speaking of cesium, it is difficult to make a mistake with it. Strontium and plutonium are something else altogether. They demand more skilled work on several levels. We have been working with plutonium since the very first days of the accident. The plutonium is mainly in the 30-km zone. In general, over a year's time we established precise boundaries for plutonium and strontium. And suddenly there was a report

that plutonium had been found near Rovno. Wild figures were cited but we certainly knew that this could not be. We organized a joint expedition with those who passed on this information and together we found that a mistake had been made."

"Be frank. How accurate was the State Committee for Hydrometeorology? Did they inform us correctly? Did they not conceal data?"

"There were no flagrant mistakes in evaluating the territory's contamination. The international expert investigation confirmed this too."

You can agree or take issue with Spartak Timofeyevich; but all the same, in my opinion, the "variant readings" for plutonium and strontium are too great. Perhaps our scientists were guided by good intentions, but any inaccuracy in this type of catastrophe does not help create trust between specialists and society. I think that Yu. A. Izrael and his associates deserve criticism—we need precise data and it is equally dangerous to either understate or overstate the doses.

Water...

There were clear skies over Chernobyl the entire summer of 1986. It was impossible to allow rain; it could carry the radionuclides along the entire Dnepr, even to the Black Sea. And thousands of soldiers worked on the shores of rivers linked to the Dnepr to protect their shores. Clean water was one of the main concerns after the accident.

I remember on 6 May 1986 we were on a boat on the Kiev Reservoir and took samples of the water. We entered the Pripyat River and went up to Chernobyl. The bottles of water were carefully packed in boxes; the analysis was done in Kiev.

After several days I asked at the laboratory: "How is the water?" "Still within the norm," came the answer. But nonetheless they drilled wells in Kiev and an extra water line was laid from the Desna—who knew then that even on this little river danger spots would appear?!

The scientists reassured us: for now there are no problems with water. Were they wrong?

The experts of the International Chernobyl Project took samples in 16 populated points of Braginskiy, Novozybkovskiy, and Ovruchskiy rayons. Of water in wells and in the supply system for the population, in ponds, lakes, and rivers. Moreover, samples of ground sediment of lakes, ponds, rivers, and reservoirs were taken.

**From the Project documents:** "The concentration of cesium in the water was as a rule lower than the sensitivity thresholds of the instruments which were used. However, in samples of the sediments from regions with a comparatively high level of contamination of the soil, higher levels were found in the upper layers of sediment, which is a potential source of contamination of the biota in these regions in the future."

[8 Jul 91 p 4]

[Text]

**When the Milk 'Shines'**

Documents are checked carefully at the control point. It makes no difference whether you are driving into the "zone" or returning to Kiev. Once, it was in the fall of 1986, we were stopped at the control point; a "stowaway," a photojournalist from the republic newspaper, had been found among the journalists. While the guard was consulting with the bosses on whether to allow us through or not, I walked along the route which rings the 30-km zone. Roughly a kilometer from the control point I saw a large hole in the barbed wire and two old women who were going into the "zone." We talked. The grannies had gone to the neighboring village for bread, salt, and matches.

"Do you live there?" I pointed at the "zone."

"We live at home, in our own houses," one of the old women answered. "The soldiers do not allow us on the road, so we must take the path."

"Are there a lot like you?"

"Half the village."

People have lived and continue to live in many villages of the "zone." They are called "squatters," although that is nonsense—what kind of squatters are they? People in their own homes, they simply can do nothing else—in one day, in one hour, they cannot turn their fates inside out and tear themselves from their customary way of life and build a new one—this is much stronger than radiation, the fear of death, and all the rest, including the barbed wire and the threats of the militia.

No, we cannot judge the old people who have returned to their homes, nor those who left for good, rupturing the threads which bind them with the past, nor those who try to come here if just for an hour, nor the militia members who try to convince people—fortunately they no longer force them!—to leave the "zone." It would seem that it would be sufficient to give the order for evacuation and thousands of buses would take people away, and afterward you could calmly "clean up the consequences of the accident." No. "Clean up" is also the concern of those people who remained. All the same until the end we did not recognize the scale of the catastrophe which had befallen our land. And we will be learning about it for many more years, each time struck by the depth of human suffering and pain.

The wool of animals was "shining." Sometimes more than the wheels of automobiles. And it was already impossible to wash it out. At first the cows, sensing danger, fled from people and ran wild, but the months passed and instinct again drove them toward people, and happily the "squatters" appeared at this time.

Now these cows are enduring a new misfortune.

Milk is the ideal carrier of cesium-137 from the natural environment to the human organism. It was not without

reason that in the first days after the accident the medical workers devoted the main attention to dairy products, trying to set up a barrier on cesium's path. It must be admitted that even in this case we demonstrated our lack of a system. I remember numerous triumphant reports by bosses of all ranks: they had managed to give the population of the regions which had suffered a full supply of "clean" products; a considerable number of reports were published in newspapers on how much dry and canned milk there was and where it went. Once Mikhail Odinet, the PRAVDA correspondent in the Ukraine, and I decided to verify these data. On the road to Chernobyl we stopped in every settlement in every village and methodically went into the rural stores and asked the clerks about "clean" milk. Of the 17 stores only one had canned milk.

I was anxious about these results as I awaited the reports of the experts of the International Chernobyl Project. For they had carefully studied the contamination of food products, in particular grain, potatoes, and vegetables.

The experiment was conducted in Braginskiy, Novozybkovskiy and Ovruchskiy rayons.

**From the Project documents: "... The measured values were lower than the values recommended by authorized domestic organs and also lower than the values set by the Alimentarius Code Commission (1989) for food products which are objects of international trade."**

However, the experts discovered that in certain samples the levels of "radioactive contents significantly exceeded" permissible levels. On the whole even the milk is "clean," but at the same time there is a sharp increase in activity in certain samples. What is going on?

It turned out that the private sector is "guilty." The products which are not controlled by state organizations are rather strongly contaminated.

**From a conversation with V. Gubanov:**

"How do you feel about these findings of the experts?"

"They gave objective data. An infrastructure was set up to analyze the samples of food products. There are about 1,200 metrology laboratories in the country. As for milk plants, combines, and state producers, output with contamination above the norm is completely ruled out here."

"Is the talk about contaminated meat being sent to Tashkent from the Chernobyl zone lies?"

"That is impossible today."

"Can the establishment of an effective monitoring service during these years be considered one of the achievements?"

"Absolutely."

"So, the private sector worries you the most?"

"Yes. If normal agriculture is to be conducted in these regions, control is needed. And, it must vary depending on the climate, rainfall, and humidity. In general, this is very complex and painstaking work which many thousands of

specialists are involved in. In my opinion, the experts gave them a high evaluation and that, I will not hide it, is very gratifying."

"It turns out that the transition to the market is dangerous for the 'zone.'"

"You may joke, but there is a fragment of truth in that. Any uncontrolled activity may destroy everything that took 5 years to create. So we should be talking about a civilized market rather than a bazaar."

**V. Doguzhiyev clarifies the experts' findings:** "Meat with a content of radioactive cesium which exceeds the provisionally permissible levels appears only where livestock must be slaughtered before they are fully fed out. According to data for 1990, the amount of such meat does not exceed hundredths of a percent. The highest figure is in Gomel Oblast, 0.09 percent. In 1990 Belorussia as a whole received 784,000 tons of livestock (slaughter weight) from the contaminated territories, and of that 0.01 percent had contamination higher than the provisionally permissible level."

I think that the findings of the International Chernobyl Project experts, regardless of whether we like them or not, should please us in terms of the quality of the equipment and the work on food products: it is one of the main directions in cleaning up the consequences of the catastrophe.

### Riddles of the Thyroid Gland

Two blows against people's health followed one after the other. At first iodine-131. It came from the radioactive cloud which rose over the reactor and then was carried over Belorussia, Lithuania, and Sweden. After several days the wind direction changed and the breath of the accident unit began to be felt in the south, including in Kiev.

We could have been protected from the blow of iodine, but, unfortunately, that was not done. Medications did not begin to be distributed until after the thyroid was "filled" with radioactive poison.

Radiation... Like Damocles' sword it hangs over people who passed through the "zone" and over those who now live in it.

Please do not say that man does not feel it! And not just those whose reddened skin swelled and who experienced that "nuclear sunburn" which is so similar to real sunburn. No, we are speaking of those who received a certain stage of "exposure" and spent many months in specialized clinics. Each of the clean-up workers, if just for a short time, felt his own helplessness, when you already feel terribly tired by noon, when cold sweat flows even when the work is not difficult but ordinary, and when you have only one desire—to lie down.

Not until five years after the accident did the Law on Social Protection of Chernobyl Inhabitants appear, and there is a great deal that science still cannot explain to all of us: how are we supposed to go on living?

The experts did not have the opportunity to study the condition of the health of the clean-up workers and because of limited capabilities they could not provide an entire panorama of the radiation exposure of the population.

The experts tried to answer three questions:

1. How accurate were the official evaluations of radiation exposure?
2. What was the level of exposure of the population in the first days after the accident?
3. What are the present and future levels of radiation exposure of the people who remain in these regions?

And once again the experts approached the problems rationally. Why duplicate the work of Soviet specialists? What is more, it is impossible in such a short time to obtain, process, and analyze the gigantic volume of information which has been accumulated in 5 years. It is sensible to determine whether this information can be believed.

Soviet research centers were opened to the experts. They visited 20 institutes and departments in the three republics where all the data of the doses received by the population were gathered.

However, the principle "trust, but verify" operated in the International Chernobyl Project at all stages and directions of the work. So the experts chose certain groups of the population which were typical of the regions which had suffered and using their own methodologies and their own data bank created in the summer of 1990 measured external exposure for 8,000 inhabitants and internal exposure for 9,000. The results of the measurements were confirmed in laboratories of France and England.

The French Central Office of Protection from Ionizing Radiation offered the experts 8,000 individual film badges [for detecting radiation]. They were distributed. Unfortunately, the children had already gone on vacation and so a "gap" appeared in the study. The research plan was not fulfilled precisely because the experts had planned to cover all age groups.

The dosimeters had to be carried in one's pocket all the time and kept near one's bed at night.

**From the Project documents:** "Ninety percent of the results were lower than the detection threshold. High dose values were registered in people who live in the regions with strong surface contamination or have worked in the open fields or the woods for a long time."

Nothing was found in nine out of 10 people. Is it possible that the results were understated? The purity of any scientific experiment depends on conducting careful monitoring. And the laboratory in France received the dosimeters anonymously, those which belonged to the experts themselves as well as those which were not used. It was

impossible to distinguish those and others in the laboratories of France; the secret of the dosimeters was carefully kept.

This fact once again reminds us of how important it is to set up mass production of individual dosimeters. All a person needs to know is exactly how many "roentgens he has picked up," and that either reassures him or makes him think about whether he is following the recommended methods of work and whether it is worth going into the forest so often; or should the question of protecting the equipment on which he works in the fields be raised more pointedly?

In mid-1990 the Project experts conducted dosimeter control of internal exposure. In all about 9,000 people were studied. A mobile laboratory equipped with four measuring devices for the whole body was used. This laboratory visited seven rayons.

What a pity that there is no similar equipment in our country. There are cumbersome stationary units at nuclear enterprises, but certainly thousands of residents cannot be brought there.

Everyone knows that the French gave us mobile laboratories and a few more were bought for hard currency—all that is useful and necessary, but it is offensive that our country, where the first nuclear power plant in the world was put on line does not itself produce such mobile laboratories.

**From Project documents: "The group's main task upon arriving at a particular place was to measure the content of cesium in the organisms of local residents. More than 9,000 residents in the Belorussian SSR, the RSFSR, and the Ukrainian SSR were monitored using portable human radiation meters. The estimates of the doses received were one-eighth to one-thirtieth the estimates of the models of transfer in the environment. The estimates of dose levels obtained independently within the Project's framework were compared with official data for the population in the selected populated points presented by the Institute of Biophysics in Moscow. The values obtained within the Project's framework were lower than the officially submitted estimates of dose levels. On the whole the levels agree within the limits of a coefficient of 2-3."**

To put it simply, the Institute of Biophysics overstated the estimated doses by a factor of two-three! Truly Academician Ilyin (the director of the Institute of Biophysics himself) ended up in an extremely difficult position. On the one hand, he is sharply criticized—do you recall the speech by the writer Belov at the session of the USSR Supreme Soviet?—for hiding data: this opinion is very widespread in the republics. But on the other, the scientists of the International Chernobyl Project reproach that same Ilyin for overstating the doses!

But the truth is that, as true conservatives, the biophysicists provided the higher values rather than the average values—and disseminated them throughout the territory which had been attacked by radiation.

Incidentally, a psychological feature of certain subjects was very unique. They were extremely dissatisfied that little cesium (!) appeared in their organisms. Yes, that is exactly what happened: a person protests because he is certain there is more cesium-137 in him.

Low sophistication and ignorance on questions of medical radiology also affected the level of local doctors who relate almost every illness to the dose received by the sick person. Anything at all can be attributed precisely to the effect of cesium, even the lack of professionalism. The experts, among other things, very gently advised local scientists and specialists to participate more actively in international programs, seminars, and symposiums so that they can obtain the necessary know-how. Is it as if some of the local scientists refuse trips to Vienna or London?! Well, unfortunately, most often it is not those who work in the "zone" and around it who are sent to such events, but altogether different people. And when we draw conclusions from the recommendations of the International Chernobyl Project, we must pay attention not only to "mistakes of two-three times" but to other advice of the experts as well, and that includes on the participation of our specialists in various types of international meetings.

While the Project experts' work was underway, a number of symposiums and talks with local specialists were held, and the experts recruited them to their own work. This type of contacts is exceptionally useful. Now the next step should be taken and the entire document of the International Chernobyl Project, including its "technical part," published. For it scrupulously describes each experiment in great detail, conducts an analysis of every figure, and carefully analyzes its own mistakes. In general this document is a unique kind of manual for specialists, and it contains all the knowledge which the world community of scientists has accumulated to the present day. It would be a pity if we did not have enough paper to publish these unique materials.

#### Health Effects

The greatest outlays and the greatest efforts of experts were focused on evaluating people's health and finding out what aftereffects could be expected in the future.

Their findings disagree with those stereotypes which have become established in our society. There is no doubt that when published they will cause a protest. There are various reasons: for five long years many scientists and politicians, residents and functionaries, specialists and demagogues have asserted the "dying out of the population," the "outbreak of cancer illnesses," "the catastrophic situation for children," and the like. Emotions have overflowed and consequently, the victims could not count on real help. Rallies were held when medicines were needed. Political passions heated up when effective medical aid was needed. The truth was replaced with slogans.

I will say right off: some of the experts' findings are questionable, it is difficult to agree with others, and some need to be carefully verified. And what is more, the scientists involved in the International Chernobyl Project

themselves admit this honestly: "Any study of consequences for health begun 4 years after the accident must have certain shortcomings and limitations, and this study is no exception."

And here is one more point. The experts worked only in small and medium-sized villages and cities—it is there that the people subjected to the strongest radiation impact live. The research did not deal with the "clean-up workers"—other methodologies and new projects are needed for that work.

The populated points had from 3,000 to 15,000 residents. Groups of residents were chosen in them dependent upon year of birth, and 20 people were examined in each. In all there were 1,356 patients.

Similar work went on in the control settlements and cities.

**From the Project documents:** "Independent medical research in the survey and control populated points did not identify deviations in the health of residents which can be directly tied to radiation, but they indicated the existence of other deviations in the health of the adult population. The results obtained confirm that 10-15 percent of the adult population should see a doctor for medical care."

One out of 10 people does not suspect that he is seriously ill! But where is our universal preventive dispensary system?! Once again, it exists only on paper.

I ask you to keep in mind that 10-15 percent of the population is ill not in the contaminated regions but in the "clean," control regions.

**From the Project documents:** "The results of analytical research obtained within the Project for samples of food products, fabrics, and the environment do not support the public's concern that toxic elements used at the Chernobyl AES site soon after the accident may possibly have been scattered into the environment. Cadmium, mercury, and lead ingested from food by the residents studied by the experts were low as compared with the populations of Italy, the Sudan, and the United States."

And once again our health workers were put in a difficult position: Alarming reports have been coming from various cities of the country in recent years concerning new diseases which have appeared among children. In particular, hair falling out. And then reports have appeared that all this is related to Chernobyl. It is much simpler that way, because it is better to accuse a stranger rather than try to deal with "your own"; after all, our own enterprises whose purification structures do a poor job discharge an enormous quantity of heavy metals into the atmosphere and rivers. And what is more, the task of medical workers is simplified—it is sufficient to mention "Chernobyl" and the sources of environmental contamination no longer need to be checked carefully.

**From the Project documents:** "Inasmuch as the thyroid gland is a critical organ from the standpoint of impact of radioactive iodine, the main attention in the international evaluation was devoted to possible pathological changes in

the thyroid gland. The data on the size of the thyroid gland and the existence of nodules in it were similar to data for other countries. Independent research using methods of radioimmunological analysis did not show violations of the functional condition of the thyroid gland in children 2-10 years of age or statistically significant differences in the functional condition of the thyroid gland in children of the contaminated and control populated points studied."

Eight hundred children were studied. The control group was in the United States. The rate of growth is the same there as in our country.

But what about the attack of radioactive iodine? Did it really pass by without a trace for the residents of the regions which suffered? No, the experts do not say that. On the contrary, they assert that careful monitoring of the condition of the thyroid gland is needed in children, and this requires special equipment which can be used to detect the appearance of nodules. But for now there is no "mass illness" of the thyroid gland, and to assert otherwise means traumatizing fathers and mothers for no reason.

And what about those numerous reports of leukemia and cancer? The experts gave the definite opinion that information on the increase in these diseases is not confirmed. Unfortunately, the number of these serious illnesses is increasing throughout the country. Is there a "Chernobyl addition" in this process? In the future it may be impossible to determine this, since it is very insignificant, to such a degree that it is impossible to use modern medical means to identify it.

**From the Project documents:** "The data we had did not confirm any substantial increase in the number of cases of leukemia or tumors of the thyroid gland; however, because of the system of classification being used and other factors the possibility of an increase in the frequency of appearance of these tumors cannot be ruled out. The only information on these tumors is in the form of rumors.

"No evidence of the appearance of cataracts as a result of radiation has been found among the population as a whole.

"A survey of Soviet data on populated points in the corresponding contaminated regions as well as in the republics as a whole showed relatively high levels of child and peritoneal mortality rates. These levels were found before the accident as well and are on the decline. No statistically significant evidence of an increase in anomalies of the fetus as a result of radiation was found."

"The food ration is not very varied, but adequate. Excess (according to international norms) weight (body mass) of the adult population was as a rule noted in all the regions studied.

"The Chernobyl accident generated a multitude of serious psychological problems involving an increased sense of alarm and stress. The overwhelming majority of adults examined both in the contaminated and the control populated points studied which the group of experts visited either believed that they had become ill as a result of radiation or had suspicions on that account."



It makes no difference to the mother of a child ill with leukemia whether he became ill from radiation or from chemicals. She just needs for her child to get well.

But knowing the sources is extremely important to a medical worker; otherwise, he will be unable to choose the correct treatment strategy.

Unfortunately, the psychological background which has become established in the afflicted regions does not promote effective work by doctors. To a certain degree they are dismayed that the recommendations of the scientists are sometimes diametrically opposed. But if academicians and professors cannot come to a uniform opinion, what can you say about the district doctor?

At times the scientists' theoretical models (essentially right ones!) do irreparable damage precisely because they do not take sufficient account of the psychological climate which has been created around Chernobyl.

Chernobyl means constant stress for hundreds of thousands of people. And for that reason it is not without reason there were not only specialists in radiation effects, pediatricians, hematologists, and specialists in thyroid gland diseases, ultrasound research, and internal diseases but also an expert on psychological and metal disorders. His findings are not only critical but also harsh. There are too many rumors and conjectures and too much speculation concerning people's health; they do substantially more harm than the radiation effects.

Let me give just one example. We call the children from the afflicted regions "children of Chernobyl." Yes, our purposes are noble ones—to help little boys and girls and to make them healthy; it is certainly they who are suffering most of all here. But the ringing phrase "the children of Chernobyl" has a negative tone. Both for children and at times for those around them. Why hide it, the children from the "zone" are seen as lepers.

The general conclusion of the experts of the International Chernobyl Project on the population's state of health sounds like a verdict on Soviet health care in general.

It is not without reason that the experts recommend first improving medical care using modern equipment, paying particular attention to hypertension among adults and hygiene of the cavities of the mouth, as well as to creating concrete programs for observing children who have had a high dose of radiation of the thyroid gland.

The experts tried to avoid dealing with the political problems facing our society in their evaluations. They invariably emphasized that they were interested in strictly scientific problems. But they immediately noticed that the scale of the Chernobyl accident had never been considered by the international community and no long-term safety measures for such a type of catastrophe had been envisioned.

Experience will not be found in the past, so the concept of the "maximum lifetime dose—35 rems" caused a furor of reaction among the population.

**From the Project documents: "The changing socioeconomic situation in the USSR had an exceptionally serious impact on the decisions made regarding safety measures. It was these socioeconomic factors which so predominated in society that they almost supplanted the more concrete aspects of the principles of radiation protection."**

Actions to localize the accident and protect the population were for the most part supported by the experts of the International Chernobyl Project. They noted that the government did everything possible to preserve the people's health.

In their report the experts assert that "the safety measures adopted or planned for the long-term, though they were certainly based on good intentions, on the whole go beyond the bounds of what was strictly necessary from the standpoint of providing radiation protection." Resettlement is just one more blow for people, and world experience shows that this type of measure reduces the life span by 10 years. The experts are confident that the risk from resettlement is substantially higher than the risk from 35 rems in a lifetime.

**From the Project documents: "The effectiveness of using the resources allocated for measures to alleviate the consequences of the accident and of using the resources allocated for other programs to improve the health care system should be compared."**

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The debate over the findings of the experts of the International Chernobyl Project began as soon as the documents were published. Even at the conference in Vienna where they appeared, some Soviet scientists questioned a number of the Project's recommendations. It is difficult to argue with the experts not only because they are specialists of the highest category, but also because the research was done with such painstaking care—each experiment may be repeated and analyzed and attempts may be made to refute them. It is also possible to end up in an awkward position. For example, when the medical specialists from the Ukraine tried to prove that statistics confirm a higher incidence of illness in the afflicted zones, the international experts demonstrated very convincingly right there that the quality of statistical research in the USSR not only does not meet world standards but does not reflect reality.

Incidentally, we have now changed to the international system of medical statistics. In my opinion, the State Committee To Clean Up the Consequences of the Chernobyl Accident took the criticism correctly.

Today the chasm between Knowledge and Ignorance is unfortunately expanding. That is one of the reasons that we are undergoing an age of catastrophes. Will we manage to build bridges across this chasm? If not, we will deprive our children of the future.

## Supreme Soviet Members at Odds With IAEA Chernobyl Findings

91WN0593B Moscow ARGUMENTY I FAKTY  
in Russian No 27, Jul 91 p 2

[Article by Yu. Voronezhnev, chairman of the USSR Supreme Soviet Committee on Ecological Issues Subcommittee on Ecological Problems of the Industrial Complex: "It Is for Them To Draw Conclusions, and for Us—To Live: 5 Million People Have Suffered From the Chernobyl Accident"]

[Text] Recently many officials have been referring more and more to the results of the work of the international group of experts from the IAEA [International Atomic Energy Agency] when discussing the Chernobyl problems. One of the main findings of the commission which analyzed the concept formulated in the USSR of it being safe to live in the contaminated territories and the effectiveness of measures to protect the population's health says: "Safety measures adopted or planned for the long-term on the whole go beyond the bounds of what is strictly necessary from the standpoint of providing radiation protection." In other words, the devil is not so black as Soviet specialists paint him.

Nonetheless, most of the members of the USSR Supreme Soviet working on this problem believe that is, to put it mildly, too daring a conclusion even for such respected and competent scientists.

The results of their work were presented in May 1991 in Vienna at a representative conference. The report of the International Consultative Committee contains five parts which include findings and recommendations. But what is it that one must disagree with?

The "History of Events" Chapter. This chapter perhaps does not contain disputed points, with one exception: "... this problem ("neutralization" of the radioactive iodine—Yu. V.) was resolved by using such measures of intervention as supplying the population with potassium iodide tablets." The population was not supplied with the iodine compounds when they were needed; and it appears that the experts were misled by our bureaucrats in medicine who, trying to avoid responsibility, cover their mistakes with lies about the iodine preventive measures supposedly applied. Referring to the resolution of the 28th CPSU Congress rather than the documents of the USSR Supreme Soviet when describing the present situation at the very least causes confusion. The impression is given that the organization mentioned is still making decisions today just as it did in 1986.

The "Contamination of the Environment" Chapter. Experts analyzed contamination of the soil, food products, waters, and air. Random samples and measurements were made and analyzed in the laboratories of six countries. The findings that the levels of surface contamination with cesium which were indicated on official maps are in keeping with reality are in my opinion indisputable. The evaluation of contamination with strontium proved to be more optimistic than the official estimate and, I believe, requires careful analysis and verification.

The international experts also confirmed the low concentration of radionuclides in drinking water and "in the majority of cases in food products." Unfortunately, our population does not have the opportunity to control the products in "the minority of cases." And the possibility of "dirty" products appearing on our tables is not ruled out.

The "Radiation Exposure of the Population" Chapter. The conclusion of this chapter is: "Official procedures for evaluating doses were sound from a scientific viewpoint. The independent evaluations for the study of populated points obtained within the framework of the Project were lower than officially presented figures for estimated doses." It is a very optimistic conclusion which, however, contradicts the following point in the report: "... It proved impossible to confirm the initial levels of contamination of soil and exposure of the population with isotopes of iodine." We may objectively speak only of the content of radionuclides in the organism of a particular person today, but even world-renowned experts cannot unfortunately precisely determine what dose he received beginning on 26 April 1986. And that should be clearly indicated in the report, but it is not.

The "Impact on Health" Chapter. For all my respect for the scientists who took part in the Project, this chapter raises a great many questions. Here are just a few points. The research did not include the "clean-up workers" or the population evacuated from the contaminated regions. The group of 1,356 patients studied by the experts is hardly representative for the 5 million who suffered as a result of the catastrophe. The report says that an exhaustive examination of each person was not done, and in so saying the following conclusions are cited: "The children examined were considered on the whole to be healthy." Pardon me, but what about the data from the Belorussian SSR Ministry of Health, for Lelchitskiy Rayon in Gomel Oblast for example: "In dividing the school children into groups by health, it is noteworthy that there is an extremely low percentage of healthy children (1.4 percent) and a very high (38.8 percent) number of sick ones." An enlargement of the thyroid gland of the first degree was identified in 50.7 percent of the children and of the second degree—in five percent. Figures are roughly the same for other contaminated regions too.

Or these findings of the report: "... a future increase in the number of cancer illnesses or hereditary changes as compared with the natural level will be difficult to determine even given broad-scale and well organized long-term epidemiological research. No statistically significant difference was found among any age groups in the surveyed contaminated and control populated points (this means illnesses of the thyroid gland—Yu. V.). The imprecision of such assertions can be proven by comparing the incidence of illness in "clean" and in "dirty" rayons of one oblast of Belorussia, which suffered to such a degree that it has no completely "clean" rayons, but there are rayons which were more fortunate. In this sense the table compiled from data at the Belorussian SSR Ministry of Health Scientific Research Institution of Radiation Medicine is very instructive.

**Incidence of Certain Types of Illnesses in the Population of Gomel Oblast (per 100,000 population)**

Oblast Rayon	Malignant Tumors			Endemic Goiter		
	1981	1985	1989	1981	1984	1985
<b>Contaminated Rayons</b>						
Vetkovskiy	203	252	361	16.39	22.11	62.86
Dobrushskiy	206	203	249	5.10	5.39	119.40
Khoynikskiy	175	218	303	6.11	2.15	210.39
Checherskiy	184	171	338	6.21	9.87	98.90
Yelskiy	168	211	315	39.29	3.62	159.53
<b>Less Contaminated Rayons</b>						
Oktyabrskiy	178	186	230	4.61	5.05	14.63
Rechitskiy	179	180	194	11.22	17.39	22.75
Petrikovskiy	173	251	220	14.84	3.85	24.54
Svetlogorskiy	163	160	248	96.26	46.44	101.24
Zhitkovichskiy	137	198	191	—	5.54	26.52
Oblast as a Whole	184	202	246	26.48	21.13	55.86

The following is the position of my colleagues at the USSR Supreme Soviet who are working on the Chernobyl problem: All the authorized programs and those under development as well as measures within the law will be fulfilled regardless of the findings of any one group of scientists. We are grateful to all those participating in the scientific support of our actions and are taking note of the various opinions, clearly understanding that no one has a monopoly on the truth and that even very highly qualified scientists are often mistaken in their findings and of course have the right to this mistake. But people who are making decisions do not have the right to make a mistake.

**Ukraine's Minister for Chernobyl Protests IAEA Experts' Findings**

91WN0578A Moscow TRUD in Russian 3 Jul 91 p 2

[Comments by Georgiy Aleksandrovich Gotovchits, Ukrainian SSR (UkSSR) minister for protecting the population from the consequences of the Chernobyl accident, on the conclusions of the international scientific conference in Vienna on the Chernobyl accident's consequences, under the rubric: "Chernobyl: Echo of the Tragedy": "Who Needs False Optimism?"]

[Text] Reports from the recently ended international conference in Vienna, which examined the consequences of the accident at the Chernobyl AES [nuclear electric power plant], has produced widespread repercussions in world public opinion. The expert commission's conclusion that the consequences are not so terrible, and that the resettlement of hundreds of thousands of people from the contaminated areas is obvious overcaution has puzzled many people.

Georgiy Aleksandrovich Gotovchits, chairman of the Ukrainian SSR State Committee for Protecting the Population from the Accident's Consequences, was among the conference participants. The state committee was changed into a ministry with a similar name literally on the eve of this

report's publication. Indeed, G. Gotovchits protested the conclusion of the experts "independent of the IAEA [International Atomic Energy Agency]." What caused this? We asked the minister to comment on the conference's conclusions.

[Gotovchits] Scientists from 38 countries took part in the rather representative conference. It was a special summarization of the prolonged work of hundreds of foreign experts in studying the radiological and medical situation that has developed in a number of areas in the Russian Republic (RSFSR), the Ukraine, and Belorussia. The help was both necessary and—it goes without saying—professional. This independent expert examination was carried out at the request of N. Ryzhkov's government. Let me note at the same time: The assignment was not coordinated with any of our, i.e., the republic's, agencies. Apparently this was considered unnecessary.

It is no accident that there are several obvious "blank spots" in the report. For example, the experts entirely omitted the problem of the group of people that has suffered the most—the more than 600,000 "liquidators" and the 116,000 residents from the 30-km zone, who were removed from the zone's confines in the first days after the catastrophe. The problem of the population that is living, even to this day, in areas with contamination above 15 curies per square km, which is a very pressing one for Belorussia and the Bryansk area, was also omitted from the international project.

We do not wish to cast aspersions on the foreign scientists in any way—they did that which they were asked to do and for which they were paid over a million dollars by our government alone, so it is said, in a highly professional and honest manner. The whole trouble, it seems, is that evaluating the health of the vast group of people which the Chernobyl tragedy touched was not called for by N. Ryzhkov's assignment. We do not rule out that this was

done intentionally in order to downgrade the severity of the accident's consequences and calm world public opinion. In the expert's report, let me repeat, both the "liquidators" and the people resettled from Pripjat and Chernobylskiy, Poleskiy, and the other Rayons which received the first radiation blast were omitted from attention.

In the summarizing document, it is noted that the reports of consequences harmful to health "have not been confirmed by either local research or research within the present project's framework." But is this really so? After all, conclusive data of Ukrainian and Belorussian scientists and physicians attest to a clearly indicated depression of the immune system, an increase in hemoblastoses, a rise in the number of sexual disorders, and dysfunctions of the auditory and vestibular apparatus. Qualitative and quantitative blood changes and progressive leukocytosis have been discovered. An increase in women's gynecological complaints and diseases of the respiratory organs is certain. Data on an increase in cancer of the thyroid gland, especially among children, compel anxious attention.

Indeed, over 8,000 children received significant radionuclide shock to the thyroid gland, exceeding permissible norms by tens and even hundreds of times, in the Ukraine alone. Where is the guarantee that misfortune will not befall many of these in a year or two, especially inasmuch as the "classic period" for appearance of the sorts of diseases due to radiation has not yet passed?

That is why the drawing of such optimistic conclusions is, in our opinion, an inappropriate act. It must be taken into account, in this regard, that the international experts' work was mainly conducted in just seven villages of the three republics. Is it right to extend conclusions about the radiation's effect on the health of a small group to vast areas and large populations in the presence, by the way, of the radioactive contamination's pronounced unevenness over the areas, which differ markedly in their isotopic mixes?

In the first six days, the emission of radionuclides from the damaged reactor of the Chernobyl Nuclear Power Plant totaled from 10 to 15 million curies! This, of course, was a most powerful iodine attack on the thyroid glands of hundreds of thousands of people. In the opinion of V. Tokarevskiy, a doctor of physico-mathematical sciences and the head of the UkSSR Academy of Sciences Nuclear Research Institute's Atomic Energy Department, the iodine shock received by Kievans during the 1986 May Day Parade exceeded the permissible norm by 20,000 times! That is, an adult individual who was in that cloud received two annual norms to the thyroid gland—about 3 rem—during one hour. That is why the international experts' prediction of the accident's possible consequences and substantive evaluation of our concept of the permissibility of rural and rayon center residents subjected to the contamination's continued residence and the necessity of their resettlement were very important. Unfortunately, however, there are no such prediction and evaluations in the findings.

We, I can tell you frankly, expected this. Would the IAEA, the organizer of the conference in Vienna, with whose cooperation the international Chernobyl project is being carried out, really permit the shadow of doubt to be cast on its authority and on its practical recommendations made in the first weeks after the accident at the Chernobyl Nuclear Power Plant's fourth unit?

For that reason, the international consultative committee neither studied nor evaluated the situation in the 30-km zone surrounding the plant, where, in a 25-square-km area on the Pripjat River's left-bank floodplain, there lies a 12,000-curie strontium patch that may be washed into the Dnieper River by floods or heavy rains.... And is the content of the 639 hastily prepared underground disposal sites really not cause for serious concern when the strontium is already changing into a soluble phase and, along with heavy rains and melting snow, getting into the ground and into underground water sources....

However, we cannot criticize the foreign scientists even for these oversights, inasmuch as the 30-km zone, with its set of tremendous, most difficult, and costly problems...also was not included in the assignment; not, of course, without the support of the leading scientific institution for the population's radiation safety—the USSR Academy of Sciences Institute of Biophysics—with its director, Academician L. Ilin, as the leader.

In short, the international Chernobyl project's findings cannot be considered conclusive. I and our Ukrainian Delegation fully espouse the evaluation given by Anatoliy Karpov, leader of the international nongovernmental humanitarian organization "Chernobyl Aid," in a press conference at the UN Headquarters in New York.

"As it seems to me," he said, "there exist two cliques in the USSR Government. One comes out for providing complete information, and the other—for providing partial information—inasmuch as it considers atomic power's development extremely important from the economic standpoint. Unfortunately, I must note that the Ministry of Atomic Power, which is absolutely disinterested in the recognition of its mistakes and real situation, was the international experts' constant partner during the study of the Chernobyl catastrophe's consequences."

Such false optimism about "the exaggerated danger" was needed precisely by that agency and a number of USSR Academy of Medical Sciences scientists, who gave the assignment to the international experts through the country's government.

Well, just one thing worries me in this regard—Will we not reap what we have sown: I hope these varnished and biased findings of the foreign experts will not affect the amounts of international aid. After all, we shall be unable to cope with the Chernobyl tragedy's consequences by ourselves, even within the framework of the future union of sovereign states.

**Chernobyl Mortality Level Claims Challenged**

*PM1807113791 Moscow IZVESTIYA in Russian  
17 Jul 91 Union Edition p 7*

[Report by S. Leskov: "On the Subject of the Reactor: Facts and Speculation"]

[Text] A conference based at the Scientific Research and Design Institute for the Power Industry, the largest in the sector, has been held in Moscow with the participation of Swedish, Finnish, and Soviet experts on the issue of safety at nuclear electric power stations in the Baltic Sea area. But the problems turned out to be more wide-ranging; sensational information about the Chernobyl accident was made public.

The USSR has three nuclear electric power stations in the Baltic Sea area, of which the Kola station is one of the oldest, the Leningrad station has the same design as Chernobyl, and expansion of the Ignalina station has not been ruled out. On the other hand, the introduction of the Swedish moratorium on the nuclear power industry, which was probably our "green" movement activists' main trump card, has been postponed. Public opinion polls show that increasing numbers of Swedes are in favor of nuclear power. This is connected with an unwillingness to reduce their prosperity, and also with the safety standards of Swedish nuclear electric power stations, which are among the highest in the world. Is this example not a way out of the situation for us as well?

Statements made recently in Great Britain by V. Chernousenko, a senior scientific associate at the Theoretical Physics Institute of the Ukrainian SSR Academy of Sciences, provided a pretext for discussing Chernobyl: Mortality among workers involved in the liquidation of the accident is extremely high. He cites figures as evidence: Between 7,000 and 10,000 people have died from radiation sickness over a five-year period, whereas it is officially claimed that only 28 people died. So is officialdom once again concealing the true scale of the tragedy?

The evidence cited was of interest to Dr. Evelin Sokolovskiy, a staffer at the Swedish Nuclear Safety and Personnel Training Center. According to official sources, a total of 660,000 people worked as liquidators at Chernobyl. About half of these were servicemen, mostly "reservists," the rest were workers. For example, during its initial stage miners were enlisted, carrying out the difficult task of stabilizing the reactor and preventing the molten fuel from penetrating into the groundwater.

According to an analysis made by E. Sokolovskiy, which took a very wide range of parameters into account, 870 people might have received radiation doses that exceeded the limit. This patently contradicts V. Chernousenko's data. Besides which, E. Sokolovskiy has made extremely careful calculations relating to the natural mortality rate in age groups similar to those from which the Chernobyl liquidators came. It became apparent that the mortality rate cited by V. Chernousenko was within the norms for these age groups in the USSR—in a sample of 500,000

middle-aged men, about the same number would die even without any kind of accident.

In the opinion of the Swedish specialist, this does not mean that there is nothing wrong with the people who worked at Chernobyl. The official statistical data is vague in many places. For example, the mortality rate among miners who were engaged in liquidation work might be higher than the normal mortality rate among the male population of the USSR. The same applies to the liquidators who came to Chernobyl during the first and most dangerous phase of the work. Research in this field has not yet been carried out. But the conclusion is not open to doubt: The figures cited by V. Chernousenko, which had such a shocking effect on a section of public opinion, are inaccurate to say the least.

I asked S. Ivanov, chief of the radiation medicine department at the USSR Health Ministry, to comment on the Swedish experts' calculations:

"Our research also bears out the fact that the mortality rate among Chernobyl liquidators does not exceed the average statistic across the country in these age groups. For example, 1,134 liquidators died in 1990 compared with a 'natural' mortality rate of 1,180. An analysis of the mortality rate among liquidators in all republics was also conducted, and in every case it turned out to be less than the average level. This information was published, and a special stand was set up at the Exhibition of National Economic Achievements. Why then all these distortions and stirring up of unhealthy anxiety? The experts fundamentally disagree with V. Chernousenko on the reasons for mortality among liquidators, and there are no grounds for speaking of mass radiation sickness. We are not simplifying the problem: There has been a history of illness; about 100 people have fallen ill, and there were 28 deaths at the initial stage. But where did a figure of thousands come from? The figures have obviously been juggled. Neither does the statistic for suicides and accidents among the liquidators exceed the average—11 percent of all deaths compared with an average countrywide figure of 8-16 percent. In this area, however, it seems to us that a more thorough scientific study should be carried out. We would like to caution public opinion against excessive credulity and sensationalist statements relating to what is indeed an extremely complex problem."

**Symposium Views Impact of Chernobyl Radiation**

*LD1308092191 Moscow ROSSIYSKAYA GAZETA  
in Russian 8 Aug 91 p 4*

[Viktor Romanchin report: "Screen of Secretiveness Opens Slightly"]

[Text] Work has been going on at the USSR Academy of Sciences N.N. Semenov Chemical Physics Institute in Moscow at an international symposium devoted to the problem of the radiological consequences of accidents at nuclear electric power stations [AES]. In addition to Soviet scientists, it has been attended by specialists from Germany, the United States, France, Japan, India, Australia, Belgium, and other countries.

"The theme of the conference is particularly important for Soviet people," USSR People's Deputy and Academician V. Goldanskiy says. "For them this problem began on the evening of 28 April 1986 via their television screens, when amid the flow of news stories the Vremya program made a modest announcement about an accident at the Chernobyl AES. This announcement was made two days after an event that shook the whole world. For two days everyone except the Soviet people knew about the disaster. And this was not by chance. The unprecedented accident not only shed light on the flaws in the development of the USSR's nuclear energy program but also on the flaws of the political system, the flaws of a closed society."

It is clear now that there were major defects in the design of the reactor installed at the Chernobyl AES, but nonetheless the main flaw was the notorious secretiveness. Only after the Chernobyl disaster was it "permitted" to write and speak about the Kyshtym accident and the contamination of the Techa River and the complex of lakes in Chelyabinsk Oblast by highly radioactive waste products. Before this we heard only about the advantages of the national nuclear power industry.

Unfortunately, it is worth stating that not all the information that exists in the Soviet Union is even getting to the International Atomic Energy Agency [IAEA]. Thus, for example, in a report by IAEA experts submitted in May 1991, nothing is said about the thousands of people who were evacuated from the Chernobyl accident zone or the more than half a million liquidators of the consequences of this accident.

"At the same time," Socioecological Union Coordinator L. Popov says, "Soviet investigators accumulated unique data about the effect of small doses of radiation on man's health. The scientific observations showed that there may be different laws governing the effect of small doses of radiation from those that govern the effect of large doses, and that these laws have been little studied at present. Recent results indicate that when affected by small doses of radiation, the most notable changes are those in the organism's resistance. Thus, among those who took part in the liquidation of the consequences of the Chernobyl AES accident the incidence of infarctions and hypotonia, diseases of the nervous and endocrinal systems, and mental and cardiovascular disorders is far more frequent."

These health disorders have also been noted in people who live not just in the contaminated territories around the Chernobyl AES but also in Chelyabinsk Oblast and in settlements and villages on the Techa River, where the major Mayak enterprise operates. Moreover, this cannot just be explained away as radiation phobia or stress: The pollution of Russian oblasts started to come to light quite recently.

The scientists talked a lot about the damage done to parent cells subjected to the action of small doses of radiation, and about the microscopic particles of fuel that enter the organism and thereby increase the likelihood that malignant growths will appear. On the whole the conference

showed that the problem of the effect of small doses has at the present time not been studied in depth.

### Specialists Question Safety of Chernobyl Sarcophagus

91WN0593A Moscow ROSSIYSKAYA GAZETA  
in Russian 5 Jun 91 p 3

[Article by Irina Khmara: "Chernobyl—Again?"]

[Text] A conference on the problems of the safety of the Chernobyl sarcophagus was held at the USSR State Nuclear Inspection Office. The conclusion the specialists drew is not comforting: "The Chernobyl sarcophagus can be described as a potentially dangerous object."

The conditions within it are clearly bad: cracks have already formed in the shell, the seal has been broken, and there is a possibility of radioactive dust escaping. A quantity of fuel, no less than 150 tons (at a concentration of 90-96 percent), has spilled under the sarcophagus, in the chambers of the fourth unit. At this point it still has not been established where the rest of the fuel which was in the unit before the accident is.

The sarcophagus rests on construction structures which were subjected to the strong impact of the blow during the explosion. And, they have been partially destroyed and so it cannot be ruled out that the cover may simply collapse. There is also no information on corrosive destruction of the elements. The biological protection lid (the "Yelena" structure), which stood "upright" during the explosion, also arouses anxiety. Incidentally, its weight is colossal.

It is not known what will happen to the installation or whether it is stable (safe) given external impacts—earthquakes or influxes of ground water and sediment. No one will say specifically how the fuel-containing elements will act in all these troublesome situations. Their condition may change. And that means that there is a danger of a spontaneous nuclear reaction.

But why is the cover so unreliable? The point is that its structure was produced in extreme conditions—on the run, in an extremely short period of time. The installation had to be covered as fast as possible and the escape of radionuclides into the air cut off. There was no opportunity to make a detailed analysis and expert study or to obtain information on the condition of the construction elements of Unit No. 4 during the accident. The work done did not always meet existing nuclear power engineering norms and requirements. The work to strengthen the elements continued in subsequent years. It was held back by the fact that many of the chambers were inaccessible because of radiation conditions. Even now, five years after the accident, it is very difficult to do a detailed examination of the elements.

Nonetheless, it was stated at the conference: Further research is needed and simply essential, and measures to rule out danger are needed. Many people proposed removing the installation altogether so that there would be only a "green plot of grass" in its place. Their opponents

asserted that it would be difficult to dismantle the structure while maintaining radiation safety. For thousands of tons of metal structures and fuel elements demand careful handling. In addition, all the dismantled equipment would have to be stored somewhere. Where? Would it not be better right at the site? A second sarcophagus must be built over the first. This time a completely reliable one. There are already proposals to develop the design of the second sarcophagus. But decisions on its construction have not yet been made. The matter again rests on the shortage of data and the need for research.

But what are we waiting for now? God forbid a second Chernobyl. Why are the specialists so calm?

Here is the prognosis A. Belyayev, the first deputy chairman of USSR Gospromnadzor [State Industrial Inspection Office], gives: "In the next 5-10 years the "Cover" installation may continue to perform its localizing function, but to ensure this careful observations of its behavior are needed. For now no serious changes in the installation's behavior have been noted. At the present time the potency of the radiation doses within the installation are decreasing monotonically."

To the question of whether cave-ins may occur, he answered that most likely that will not happen, although there is no 100-percent guarantee.

### **Chernobyl Radioactive Cooling Water Leak Reported**

*LD1608181291 Moscow TASS in English 1800 GMT  
16 Aug 91*

[Text] Moscow August 16 TASS—The Soviet Ministry of Atomic Energy and Industry on Friday released the following statement on the incident at Chernobyl nuclear power plant.

"At 2:27 a.m. on August 10, reactor number two at the Chernobyl nuclear power plant, which was under repair, suffered a nuclear incident ranked as a second-degree danger on the international seven-degree safety scale.

"During repair work on the shut-down and cooled reactor, there occurred a loss of sealing on one of the pipes, causing a leak of several cubic meters of radioactive cooling water into an area adjacent to the room with a major circulating pump. The water radioactivity in the shutdown reactor was ten to the minus sixth power curie per liter. The water was drained into a special water-waste disposal system. None of the plant workers received any radioactive doses above the norm.

"Reactors number one and three operated normally.

"The incident is being investigated by a special commission".

### **Chairman Yavorivskyy Discusses Work of Ukraine's Chernobyl Commission**

*91UN2305B Kiev SILSKI VISTI in Ukrainian  
19 Jul 91 p 1*

[Interview with V. Yavorivskyy, chairman of the Commission on Questions of the Chernobyl Disaster and people's deputy, by SILSKI VISTI correspondent N. Tsyupa: "Chernobyl Hurts Everyone"]

[Text] Recently the third session of the republic's Supreme Soviet ended after having lasted almost six months. What were the concerns of the Commission on Questions of the Chernobyl Disaster during all this time? What was accomplished? What needs to be worked on? Our correspondent asked V.O. Yavorivskyy, chairman of the commission and people's deputy, to talk about this.

[Correspondent] Volodymyr Oleksandrovykh, in order to gain a better outline of the work of your commission, perhaps it would be best to turn briefly to the period when it started functioning. To its first steps.

[Yavorivskyy] Unfortunately, it never occurred to anyone who worked in parliament before us to create a commission. Even though such a commission should have been created as early as the third day after the disaster at the Chernobyl nuclear power station: a deputy group which would camouflage nothing. We inherited a very difficult legacy, that of maintaining constant silence. The commission began to work in a vacuum. We had to proceed by trial and error. The first thing we concentrated on was information. We needed it in order to function. In general we are a society of constant disinformation, and Chernobyl started out the same way. All our efforts went toward gathering correct information.

[Correspondent] That was probably difficult to do.

[Yavorivskyy] Even worse than that. I remember the first meeting of the commission, to which we invited representatives of the State Hydrometeorological Administration, the Academy of Sciences, and the agro-industrial complex. Someone tried to make light of the situation in a cheerful voice. It was necessary to make them realize that the time of liars and dilettantes was passing and that no one would be let off the hook. Even though we ourselves were dilettantes, we were prepared to become professionals, open to all.

Deputies from Zhitomir and Rovno Oblasts, those regions which were most affected by the trouble at Chernobyl, were on our commission. We immediately started the television show "Dzvony Chornobylya" [Bells of Chernobyl], received permission to broadcast the information we received over the air twice a month, introduced the practice of the news conference, where we also give out information, and enlisted the press in our affairs.

At the first session, the first decree concerning Chernobyl was adopted: parliament's first document which paved the way for the creation of an institute on the problems of Chernobyl and based its demands on the appropriate laws. We let people understand that a parliamentary institution

had finally appeared which would work in the interests of the people who had lived through the hell of Chernobyl.

[Correspondent] Specialists on these problems and other such people were enlisted by your commission.

[Yavorivskyy] Yes, while working out our strategy and deciding organizational questions we relied on such people. We staffed the commission with expert consultants. We took those who had experienced Chernobyl. For example, M.V. Karpan. After the disaster he was the deputy head engineer of the Chernobyl nuclear power plant on questions of science. He has radiation sickness. He is a very honest, clearheaded, and knowledgeable person. A.O. Bulhakov, a medical man who worked at Chernobyl, came to us and is in charge of medical aspects. There is Ye.H. Tykhonov, an engineer from there, and M.M. Borysyuk, a specialist in dosimetry. I met him in May 1986 in the zone. There is V.D. Lisovyy, the former editor of the Chernobyl Rayon newspaper.

[Correspondent] The third session took place under the aegis of three laws pertaining to Chernobyl: on a concept for safe residence, on the status of the territory, and on social protections for the population.

[Yavorivskyy] There is much drama behind that. I cannot say that the laws are working at full effectiveness, but they are already breathing and living. It was difficult to draft them—there were no analogues in world practice. We took whatever we could from European legislation. Public organizations such as "Chernobyl Union," "Green World," and the trade unions helped a lot.

[Correspondent] What was the most important thing in this work?

[Yavorivskyy] Not to let any category of people who were burned by Chernobyl slip by. But however much we tried, we did not take into account some instances. Even those who worked at the first aid stations where the victims first underwent medical treatment were included in the lists. But we forgot the doctors who accepted the "contaminated" in Poleskoye and Ivankov and gave them in-depth treatment there. Of course we are working now to rectify the error.

There are many complaints. Categories of people such as drivers often have troubles. In one place they did not have time to make up the appropriate documents for them, in another they lost the documents, and now it is difficult for people to defend their rights.

[Correspondent] Here at the editorial board we also receive numerous complaints.

[Yavorivskyy] God forbid that there is any new trouble—those bosses who usually send their subordinates out now find it necessary to go to the place of the trouble. And how many difficulties they create! Now they send off their claims personnel from all over the countryside to the commission (where there are only 12 deputies). If you do not have a scrap of paper you need, take care of it yourself:

Find it, write it up, look up the laws, study them, and do not brush off those who showed courage and conscientiousness.

[Correspondent] With the aid of the press, the drafts of the Chernobyl package of documents were introduced for national discussion in the literal sense...

[Yavorivskyy] They were published and everyone was given time to present his opinion on it. Our commission received thousands of letters. The co-authors of the laws were themselves survivors of Chernobyl. They prompted us, advised us, and asked us to take into account certain categories of victims. When it was a question of privileges, we constantly had to remember about the empty treasury. But the people are not to blame for the misfortune which occurred. The state should settle accounts with them. We have had to struggle with the government, which was defending its own interests.

We ourselves did not believe that these laws passed. Chernobyl was a concern of all the deputies and consolidated all political forces. They all forgot about ambitions and political views. Our laws were adopted by a parliamentary majority.

[Correspondent] Now that the laws are adopted, it would seem that the commission can be satisfied with what it has done.

[Yavorivskyy] How difficult it is to implement them! Some bureaucrat expects a person to visit about ten times and to grovel before receiving the privileges due him. After considering all this, we insisted that a government report be submitted at the session regarding a mechanism for implementing the laws. In this we are unyielding. Taking advantage of the large audience of readers that the newspaper SILSKI VISTI provides, I want to inform everyone that the parliament's ruling concerning the issues of Chernobyl took effect as of 1 July. All privileges should be granted (or paid) beginning 1 April. We are not rich—the treasury of the republic is empty—but we cannot yield on these issues.

I do not idealize what we have done. There are also some mistakes. At times we begin to get involved in affairs that are not ours, for example questions of the treatment of children, which is under the jurisdiction of the Commission on Affairs of Women, Protection of the Family, Motherhood, and Childhood.

The center is piling on work as well. These days the entire commission is working to refute the "statement" signed by Ryzhkov: To clean up Chernobyl through the International Atomic Energy Agency. And then they drafted the subsequent document in Vienna. False information was put into the report—it says that eight million people, practically the entire contaminated region, underwent iodine treatment in the first days after the disaster. Where? When was that? Romanenko, the minister of public health at that time, advised people to wash their hands.

That is false data. A rumor went around the world that we exaggerated the consequences of the disaster by a factor of four. It is not simply that there has been an lie, but that an



attempt has been made to divert the attention of the world community from such an important problem. In the name of the Ukrainian parliament we have expressed our opinion and cited our arguments concerning this outrageous incident.

[Correspondent] Volodymyr Oleksandrovych, some of our readers are alarmed by the fact that instructions are being developed in high offices to supplement or clarify the Chernobyl laws. People are afraid that an attempt will be made to "emasculate" the privileges that have been stipulated.

[Yavorivskyy] They should not be alarmed. I repeat that this is the first time such laws have been adopted, in our practice or in world practice. It is necessary to work out a reliable mechanism for implementing them. We must take our system into account: For the great majority of bosses a law is something far above them and far away, but instructions are right in front of their eyes and can be referred to. Perhaps in a few years such instructions will not be necessary, but today an implementation mechanism is necessary. This is not enacting legislation, but rather a mechanism for the implementation of the laws. The commission believes that it will be worked out and that everything will go normally. We know, there is information from the local level, that various violations are occurring these days. Another two to three months of confusion will pass, the necessary papers will make it to each bookkeeper, and everything will become normalized.

Supervision over the implementation of the Chernobyl package of laws is entrusted to our commission. Before the mechanism for their implementation is adopted, it must be discussed by the commission.

[Correspondent] The organization of supervision of the implementation of laws is something new in the work of the parliament. For the present only your commission and commissions on questions of the agro-industrial complex and the renewal and development of the countryside have resorted to this.

[Yavorivskyy] We submitted to the session a governmental report on a mechanism for putting the laws into effect because they are being implemented slowly. People have been criticizing both the government and K.I. Masyk, first deputy prime minister, who, I emphasize, has voluntarily taken upon himself the conduct of these issues and understands their importance.

[Correspondent] But that did not keep you from saying at a session, "Masyk is my friend, but the truth is dearer to me."

[Yavorivskyy] I do not belong to those people who reduce everything to criticism of the government. Yes, the previous makeup of the parliament was decorative and overly dramatic. Now the parliament has sensed that it is the supreme power. I am categorically against a frame of mind where "we can ignore everything that is lower than us." It is important to adopt laws, and it is still more important to implement them. I understand this. But the people of Chernobyl have been waiting five years. They have

endured not only the lightning bolt of Chernobyl but also four years of silence, deceptions, and lies. The people have lost faith. They wanted to know the truth and they have heard it. The truth does not cure all wounds. The people who have suffered are desperate, ill, and torn from their homes. They cannot wait any longer. Therefore we must spur on the commissions and spur on all who have some bearing on the implementation of the law. The misfortune is that the Chernobyl mishap caught us in a period of economic crisis.

The discussion at the aforementioned session was a lesson for the government. Someone has hinted that "the government was willing" but the deputies were hindering it. I do not agree with that. This is the normal course of events. The government is not accustomed to supervision. We are not only monitoring the implementation of laws, but at the same time we are implementing a mechanism for supervision. It is not enough to observe from the side or make a lot of noise for nothing.

The commission is planning to submit the next report of the government at the fourth session. And we will strive to get the Chernobyl laws working. The people have heard that the work of the government is being supervised and that the deputies can tell the truth. And we will be unyielding on this issue.

[Correspondent] What is your opinion of the situation in Kiev? On one hand the press is printing maps of radiation contamination in the city, and on the other hand the residents of Kiev have been assured for many years that there is no threat and it is all radiation phobia.

[Yavorivskyy] These maps were developed at the request of our commission by "Ukrgeologiya" [Ukrainian Geology] and "Kirovgeologiya" [Kirov Geology]. And they should be thanked for them. These are offices which, as opposed to the State Hydrometeorological Administration (which has not even made an attempt to rehabilitate itself), are prepared to tell the truth and do not wait to be forced to work.

The maps have given rise to alarm. Large spots were shown on the Troyeshchina, the Podolia, and in the center of Kiev. The city soviet has taken a radical position. It has adopted an appropriate ruling and asked the government to designate Kiev a fourth zone, a zone of strict radiological control. Even at very approximate calculations that will cost seven billion rubles, while our laws will cost six billion.

The data on Kiev that we have today has pushed the government to the wall. Let us suppose that the Ukraine gets this money from the Union budget. Whose money will rescue our children? There is only one solution: to wash and clean our city. To make our own local attempts at decontamination (incidentally, it is expensive) and to tackle it together in order to do everything that is necessary.

We need to fit out the Kiev polyclinic with the newest diagnostic equipment. Ukrainians living abroad will be

very helpful in this instance. In particular, the former obkom [oblast committee] polyclinic is ready right now to help the sick.

We must make Kiev a free economic zone. Then we will have the necessary money and clean products. That is my position. But I will have to defend this opinion.

[Correspondent] What is your commission working on these days?

[Yavorivskyy] We are fighting on two fronts. A great number of issues and rulings that have been adopted have not been completely dealt with. The zone must pass into the jurisdiction of the Ukraine; even now a Union department is in charge there and wastes enormous amounts of money at its own discretion. Without supervision. They do not know what to do with the fourth power unit—at present their proposals are either incompetent or unrealizable.

There is a problem with the very contaminated left bank of the Pripyat. With the very first flood that contamination may end up in the Dnepr and create a threat for almost 35 million people who use the water from it. The commission has been raising the alarm. Only just now have they begun construction on a polder-style dam.

We must do something about the water in the zone where the subsoil waters are close by and, unfortunately, there is a famous reddish forest and a swimming pond.

We must put all these and other questions before the government and obtain their resolution in order to defend the people from the system of indifference, if you wish, and from the state.

There is still much dilettantism and populism in us. And in me in particular. It is one thing to talk from a tribune and another to begin to work. That, incidentally, is very difficult.

[Correspondent] Thank you for the interview. I am sure that all of us here at SILSKI VISTI and our readers wish the Commission on Questions of the Chernobyl Disaster the greatest possible success in its activities.

### **Belorussian Council of Ministers Finds Chernobyl Cleanup Progress 'Unsatisfactory'**

*LD1008163291 Moscow All-Union Radio First Program Radio-1 Network in Russian 1200 GMT 10 Aug 91*

[Text] Implementation of the Union and republic program to eliminate the aftermath of the Chernobyl catastrophe in Belorussia is proceeding unsatisfactorily. This was noted by the Presidium of the Republic's Council of Ministers at its latest meeting devoted to a review of these problems.

The task of resettling the population from contaminated places is not being fulfilled. Some organizations have still not fulfilled the 1990 plan for the construction of residential houses for those being resettled. The situation with respect to providing medical services for the population remains acute.

The Republic's Council of Ministers sharply criticized the leaders of a number of ministries, departments, enterprises, and organizations who have been forgetting their duty to the people suffering as a result of the accident.

### **Penyagin Views Scope of USSR Nuclear Safety Problems**

*91WN0576A Moscow NEZAVISIMAYA GAZETA in Russian 15 Jun 91 p 6*

[Interview with Aleksandr Nikolayevich Penyagin, chairman of the USSR Supreme Soviet Subcommittee on Atomic Energy and Nuclear Ecology, by Leonid Skoptsov: "Our Population Is the Most Irradiated in the World: A Conversation With the Man Who Knows More About Radiation Than Anybody Else in the USSR"]

[Text] This man, Aleksandr Penyagin, is chairman of the USSR Supreme Soviet Subcommittee on Atomic Energy and Nuclear Ecology and a former refractory materials specialist at the Chelyabinsk Electrometallurgical Combine.

The cabinets in his office are filled with files of unique information: Aleksandr Penyagin is possessor of the only data bank in the country and the world on our country's radiation status. The map in his office is also unique and singular: "Radioactive spots" are scattered over it in all the colors of the rainbow—the Ukraine, Belorussia, Russia: Bryansk, Orel, Kaluga, Tula, and Arkhangelsk oblasts; the South Urals: Chelyabinsk Oblast....

[Skoptsov] Aleksandr Nikolayevich, the "Chernobyl Era's" sixth year has passed. How many "unknown Chernobyls" have there been?

[Penyagin] There had already been three very major radiation incidents before Chernobyl. All were near us in Chelyabinsk Oblast, at the now notorious Mayak Production Association near Kyshtym, where the defense people had dumped nuclear waste into the small Tech River since 1949 and irradiated almost 140,000 people. Almost a thousand radiation diseases were officially registered on its banks alone, considerably more than at Chernobyl.

A container with radioactive contents exploded at Mayak in 1957. The radioactive emission was entirely comparable to Chernobyl—20 million curies, as opposed to Chernobyl's 50 million. The radioactive cloud carried another 2 million curies over Sverdlovsk and Tyumen oblasts.

Finally, Lake Karachay, a depository with a 120-million curie content, is a constant source of radioactive danger. Waste is being dumped into it even now. Radioactive dust from Lake Karachay's shoreline has already irradiated 41,000 people.

A great many other incidents—primarily on atomic submarines—fortunately have not had such catastrophic consequences.

[Skoptsov] Are you sure the powerful defense agencies have not concealed some "domestic Palomares" from the Committee on Ecology and your subcommittee? After all, there is

*a rumor that there was some kind of explosion—either nuclear or thermonuclear—in the Subarctic Urals at the end of the 1950's. And, in general, how do you find out about one or another nuclear incident?*

[Penyagin] Atomic subjects have always been behind a thick security curtain. We, too, had difficulties at first in obtaining access to the necessary information. In 1989, however, the Supreme Soviet ordered all officials of all ministries, agencies, organizations, and enterprises to make all information concerning ecological problem areas available to us.

The ecological problems were declassified. The defense types are disciplined people. There is an order—they obey it.

Moreover, the Chernobyl catastrophe also brought about a drastic change in the thinking of the specialists from the defense complex. They are earnestly helping us.

More succinctly speaking, we are experiencing no particular difficulties in obtaining access to the necessary information. There is another problem in this regard: The information's volume is so great that we are drowning in it.

Now, about the "domestic Palomareses...." Our committee has no information in this regard at its disposal. I doubt that it would have been possible to conceal an event of such proportions. In general, however, we immediately make official inquiries into every fact connected with radiation danger, or the threat of such danger, that has become known to us—and we have the potential to obtain a sufficiently complete picture. Here it is important that the questions be specific.

[Skoptsov] *How many Soviet citizens have suffered from our peaceful atom? From test explosions? From all of those leakages and seepages?*

[Penyagin] The exact number of those who have suffered is not yet known, just as there is no map on the status of radiation in the USSR. It is known, however, that people are becoming ill in both the places where radioactive ores are mined and the places where they are processed, and where nuclear weapons are tested. In the areas contaminated after the Chernobyl catastrophe, 4.8 million people reside; in the South Urals—0.5 million; in the vicinity of the Semipalatinsk Proving Ground—0.5 million. We are now collecting data on the Novaya Zemlya Proving Ground and the condition of the contiguous regions—something will also be discovered. And the 117 peaceful explosions? These did not take place without a trace either.

On the whole, indeed, we have the most irradiated population in the world, thanks to x-rays and fluoroscopy. Other, harmless, medical diagnosis technologies have long since been in use in the world. All of this, however, does little to rouse our public opinion.

Our citizens, in general, know very little about radiation. They calmly put radioactive metal in the scrap metal so

that hundreds of work crews throughout the country may later pull "hot" metal out of the lot. And this is not occasional.

You understand, the country has been living in a state of nuclear lawlessness since 1949. There are no guarantees at all that a new mishap will not occur tomorrow, and the ordinary citizens will find themselves just as unprotected and without rights in its regard as the natives of my region 40 years ago and the Chernobyl victims in our times. We are now striving to present the draft of a law "On Atomic Energy and Nuclear Safety" at the fall session.

[Skoptsov] *Do you think that a legal rein will be able to restrain the nuclear genie?*

[Penyagin] It cannot be done without a law. The absence of a law also causes direct monetary loss. One example: Atomic energy production is now a battle zone. There are political rallies, referenda, and petitions. Construction is being frozen, and AES's [nuclear power plants] are being temporarily shut down. Have the agencies made peace? Behind their peacemaking, there is an ulterior motive: You freeze awhile and spend some time without electric power, and you will give AES's the go-ahead and forget about both the faults under the foundations and the unreliable reactors.

A law must rise between the people and the Minatomenergoprom [Ministry of the Atomic Energy Industry]. It must be decided on that law's basis alone whether an AES may be built, where it may be built, and what requirements it must meet.

[Skoptsov] *In IZVESTIYA editions, Academician Sheydlin proposed that a 10-year moratorium be declared on the spread of AES's in order, at last, to create a safe domestic reactor during those years. What is your attitude toward this idea?*

[Penyagin] I am for the moratorium. What is more, in order that truly safe and reliable AES's may appear, it is necessary to take atomic energy production out from under the wing of the defense establishment in all respects. After all, all of our reactors are dual-purpose—civil and military. Only purely peaceful plants will truly be safe.

[Skoptsov] *And the final question.... It, too, is about safety and AES's. The country faces the threat of an outbreak of terrorism. What is being done in order that AES's will not become a target for terrorists?*

[Penyagin] There have already been 50 terroristic acts with respect to AES's in the world. The danger is real, and thank God our government understands this well. Even Chernobyl has been strengthened. During the last year and a half the security system of AES's has been improved substantially. However, the problem nevertheless exists.

### **Experts Dispute Public's Negative Views on Nuclear Plant Safety**

*LD0908155691 Moscow Radio Moscow World Service in English 2300 GMT 8 Aug 91*

[Text] The Chernobyl nuclear disaster is one of the most crucial catastrophes in the history of the world civilization.

After it the development of nuclear engineering in the Soviet Union was actually brought to a standstill. The public campaign against nuclear plants played a big part in that. Yet latest conclusions drawn by international experts have failed to confirm part of the allegations advanced against nuclear plants.

Today the work has stopped at some nuclear plants that are still under construction. Some operating nuclear plants are being closed down and some newly-built plants are prevented from being put into operation.

In the meantime the newspaper SOVETSKAYA ROSSIYA quotes French experts on nuclear energy as saying that the danger of nuclear plants for the environment has been slightly exaggerated. Prior to this, independent experts of the International Atomic Energy Agency have been keeping an eye for 18 months on a large group of people affected by radiation in the Chernobyl plant zone and have been checking the effectiveness of protection measures. In their opinion the concentration of radio-nuclides in drinking water and in most of foods is presently lower than is allowed by international norms. A short half life has led to the disappearance of radioactive iodine.

Some leading nuclear experts of Austria, Canada, Finland, France, Japan, Britain, the United States, and the Soviet Union working at the Atomic Energy Agency see the main task as being to persuade people who are treating nuclear energy with distrust. But there are some who are utterly against the use of nuclear power. They put forward two arguments against it—ecological and economic.

SOVETSKAYA ROSSIYA quotes them as saying that nuclear energy is expensive and harmful. This group of people rejects the conclusions drawn by experts of the Atomic Energy Agency, the most prestigious organization in that field.

The Soviet weekly ARGUMENTY I FAKTY, for example, has carried statistics showing that the sickness rate has gone up sharply in the Gomel Region. Experts claim that in many cases negative statistics can be disproved by professionals. In their opinion the damage done to the health of some examined Chernobyl residents does not exist or can hardly be established.

French experts recently carried out similar examinations in the closed city of Chelyabinsk-65. Forty years ago an atomic reactor Mayak began operating there. According to the newspaper SOVETSKAYA ROSSIYA the reactor has done an enormous ecological damage over this period. After carrying out a study on this subject the French experts told a news conference on Chelyabinsk-65 that though Soviet experts lagged behind in certain technologies they carry out their work in the field of nuclear power in keeping with world security standards. They attributed the damage done by the reactor to the difficult conditions of the post-war world. The French experts called on the Soviet authorities and the public to think over the country's future once again before closing down nuclear plants and halting their construction.

It seems that the government will have to make a choice between the demands of the public and the conclusions drawn by the experts. The stakes are high—people's health and the opportunity to deal with the present energy crisis.

In view of the current conclusions made by international experts it is most likely that debates around nuclear engineering will be put on a more professional plane. Arguments advanced by the public will give way to more substantiated conclusions by nuclear experts.

**'Scientific Nuclear Explosions' in Kuzbass Alleged**  
*LD0208091291 Moscow All-Union Radio Mayak Network in Russian 0600 GMT 2 Aug 91*

[Text] According to a POSTFAKTUM report, Aman Tulyeyev, chairman of the Kemerovo Oblast soviet, has asserted that scientific nuclear explosions were carried out in the Kuzbass. He said this on oblast television.

The chairman of the oblast soviet said that he has information about tests but no relevant documents. Having noted that he regards the concealment of official data as a crime, Tulyeyev stressed that full clarity is needed in this issue. After all, there are old residents who speak about explosions. The relevant bodies, the chairman of the oblast soviet said, have been instructed by him more than once to sort things out; however, he has not yet received an official confirmation.

**Defense Ministry Offers Compensation for Semipalatinsk Nuclear Tests**

*LD0408163391 Moscow All-Union Radio Mayak Network in Russian 1400 GMT 4 Jul 91*

[Text] The Defense Ministry has offered 5 billion rubles to residents of rayons bordering the Semipalatinsk testing ground in compensation for three nuclear tests of over 20 kilotons scheduled there. The Kazakhstan Supreme Soviet decided to hold a referendum on this issue among the local population in August.

Suleymenov, president of the Nevada-Semipalatinsk movement, called upon the future participants to vote against the issue at the referendum. Five billion rubles is a sufficiently big sum for our country, and I would like to dwell on this information a bit further. Where is the Defense Ministry going to get the 5 billion rubles? They can hardly be obtained as a result of an unplanned privatization of generals' summer houses. As a matter of fact, when the budget of the Defense Ministry for this year was being ratified at a session of the USSR Supreme Soviet, all its main articles were revealed for the first time. And no such article, mentioning a sum of 5 billion, was mentioned there.

**Effects of 1964 Semipalatinsk Nuclear Test Investigated**

*91WN0617A Moscow IZVESTIYA in Russian 22 Jul 91 Union Edition p 3*

[Article by IZVESTIYA Correspondent S. Yeremeyev, Ust-Kamenogorsk: "Chagan Is Not Chernobyl But This

**Does Not Make It Any Easier for the People Who Cleaned Up the Aftereffects of the Nuclear Detonation at the Semipalatinsk Test Range and Survived"]**

[Text] They brought a bulky folder containing two years' worth of practically fruitless correspondence to the IZVESTIYA correspondents office. Because, as a rule, noncommittal answers by which no one was bound or even frank referrals to other people followed in response to their pain and hope. And then simply just silence which falls under the definition of "deathly": they waste away, become disabled, and die. Ahead of time. Less than 30 people remain alive of the 300 who worked at the "Atomic Lake" during the winter of 1964-1965.

So, this is one more of Semipalatinsk Test Range's half-revealed secrets—according to count how many are ahead? In December 1964—some publications mistakenly name 1965—a nuclear explosion was conducted in the channel of the shallow Chagan River which formed a gigantic bomb crater: according to the information of the people who eliminated the aftereffects, nearly 3.5 million cubic meters of dirt and ash were ejected from the epicenter. Radioactive dust covered an enormous territory: villages, vegetable farms, and fields. Black ash instead of snow lay in an eight km radius....

I quote a collective letter to the IZVESTIYA editorial staff: "Residents were evacuated during the explosion but they were returned to their homes after the explosion as if nothing had happened. USSR Ministry of Public Health Third Department doctors continued to study the effect of radiation on the local population. Conditions were as follows: for a long time it was impossible to even wear shoes, they required painstaking decontamination which, however, no one conducted. But in order to prevent the flood from washing the dust, filth, and the dirt that had spewed forth across the valley into the Irtysh, the ruling circles hastily made a secret decision: To break through the wall of the bomb crater with a channel, dam the river channel with a dike, and flood the lethal valley. Ust-Kamenogorsk residents and to the enterprise "Post Office Box 16," hereinafter referred to as "Irtysh Construction Administration," were tasked with the urgent work.

Vladimir Vasilyevich Zhiron tells the story—now he is chief of the Irtysh Construction Administration production-dispatch department but, at that time, he was the master of the post office box.

"I was 23 years old but neither I, nor those who were older or younger, thought that that bitterly cold winter's production task would turn out to be fatal for us. We had been raised that way: the Party ordered and the Komsomol responded: "Yes, sir!" Once they direct you, you need to go. Indeed, I asked the leader: what will I do about my night classes? The leader answered: 'Nothing, you will catch up, you are still young...'"

They rapidly collected the equipment and knocked together huts for temporary living. In January, they headed out from Ust-Kamenogorsk to Semipalatinsk and from there to the site of the explosion. The people who were

eliminating the aftereffects of the explosion located the wooden village about five kms from the epicenter. There were small bourgeois iron heaters in the huts but the 40-degree frosts took their toll. The frosts diverted us from the numbing horror that had somehow seized everyone without exception:

"The explosion site was a monster, it was the wrath of God," continued V. Zhiron. "I went there and the blood rushed from my nose. I pulled the ski mask from my face, my clothing was soaked in blood, I exhaled, and I went on: I had to!"

"All of us were like that," Viktor Yefimovich Bogomolov, both then and now a geodesist joined in the conversation. "The proper and knowledgeable military topographers, of whom hardly anyone remains alive, warned: 'Peasants, you can excuse us for your health but the Homeland will not forget you.' These same military personnel, without any particular second thoughts, rejected the official report on the nature of the 'nuclear explosion-experiment for peaceful purposes.' An international moratorium on surface explosions was in force and this was planned to be an underground explosion. But they had obviously changed their minds or the nuclear "stuffing" had not produced the desired results. This is a supposition, we do not have any documents."

How do I say... The very people who were eliminating the aftereffects brought a copy of the geological map to the correspondents office where it listed in black and white: "The bomb crater formed as a result of a nuclear surface explosion t. 'Ch' (Chagan River, Semipalatinsk Oblast)." I stress: **The blast is to be a surface explosion.**

But those people who remain alive are not at all interested in those fine points of grand policy or, I suggest, the small tricks of the military-industrial complex. After fulfilling the assigned task, people actually lost their health, and they turned out not to be needed by the Homeland or, more precisely, by the department. Former Minister Yefim Slavskiy has died. "Post Office Box 16" became the irtysh Construction Administration, the tightly restricted Ministry of Medium Machine Building was transformed into the semi-restricted Ministry of the Atomic Energy Industry, and the work at Chagan remained a secret story. Healthy Vladimir Zhiron, who has fine heredity and whose parents are over 80 and still alive, was the first to begin to be bothered by the injustice after his last hospital stay where it took them several hours to stop his nose bleed. He turned to his comrades: Why are we being silent? They responded in different ways: it is a hopeless cause, no one can prove anything; they gave him signed statements—you need to be quiet or the KGB will put you away somewhere for a while. But the majority of them have become a minority—that sounds bitter—supported V. Zhiron: we need to fight for our rights. They proceeded up all levels in the department until they reached the current minister V. Konovalov. They did not receive a response directly from him but his subordinates do not always respond on the matter and they are quite indifferent.

Here is one response to V. Zhirov: "You listed the benefits that workers have in your letter... Other documents were not submitted according to government and ministry policy as it was done during the elimination of the after-effects of the Chernobyl Nuclear Power Plant. Deputy Organization Chief L.B. Zabiya." "

But this is not a question of symbolic benefits of a quarter of a century ago but about what happened to people as a result of the fact that they carried out a very dangerous job task and how now they would like to be compensated in part for what has been irretrievably lost. Another response, Deputy Minister A. Piruyev's, was a bit more cordial: "To the Irtysh Construction Administration workers' request who worked while carrying out the work [the author's style has been preserved—Author] to eliminate the aftereffects of the experiment at test sites 'Ch' and 'K' and the question raised by the workers about benefits and the offer of pensions, I report, that at the present time we are working on the issue of the possibility of extending medical and social security support to individual categories of USSR Ministry of Atomic Energy Industry workers that are similar to those adopted for participants in the elimination of the aftereffects of the accident at the Chernobyl AES [nuclear electric power station] in accordance with the USSR Council of Ministers and the All-Union Central Trade Union Council [VTsSPS] Resolution No. 325 dated March 31, 1990."

Here there are already other structures in place of the USSR Council of Ministers and the VTsSPS. A Cabinet of Ministers order—(No. 554 R) dated June 3, 1991—that is similar to last year's Council of Ministers resolution has already appeared. But the issue is still being processed and processed. Meanwhile, Geo-ecology Expert Professor Yevgeniy Yakovlev, having listened to the people who worked at the site along with me and having seen the miracle of the individual documents that have been preserved, defended them: "You had it much worse than at Chernobyl...."

But Chagan is not Chernobyl. And the Chelyabinsk MAYAK is not Chernobyl. There have been many not-Chernobyls in our country. Other years and other morals. So what now: Will we wait until time writes off everything? Or this way: until time writes off everyone?..

### **Kazakh National March Held for Closure of Semipalatinsk Testing Ground**

*OW0608234091 Moscow INTERFAX in English  
1700 GMT 6 Aug 91*

[Following item transmitted via KYODO]

[Text] On Tuesday, the Kazakh CP Central Committee published a statement marking the beginning of a national march for closing the nuclear testing ground in Semipalatinsk (the march began on August 5 and will continue till August 29, when the 40th anniversary of the first nuclear test in Kazakhstan will be marked). The statement confirms adherence to the resolutions of the recent congress of the Kazakh Communist Party on the unconditional prohibition of nuclear tests and on the closure of the testing

ground in Semipalatinsk and its utilization for scientific and peacefully purposes alone.

The statement also says that "because of the 40 years of destructive experiments the residents of Semipalatinsk and of the adjacent Pavlodar and Karaganda regions have every right to reckon on state support without any additional terms."

INTERFAX also reports that at a joint meeting, the Central Committee of the republic's Komsomol and Committee for Youth Organizations backed the action of the Nevada-Semipalatinsk movement for closing down the nuclear testing ground.

### **Radioactive Waste Problems in Kazakhstan Examined**

*91WN0615C Moscow PRAVDA in Russian 19 Jul 91  
First Edition p 2*

[Article by PRAVDA correspondents G. Dilyayev and T. Yesilbayev: "The Burial Ground—'The Radioactive Waste Storage Problem Has Been Concocted'. To Think That Is a Dangerous Misconception!"]

[Text] The Kazakh SSR—The following fact was recently publicized in the Kazakhstan press as a curiosity. A certain provident toolmaker had kept some sort of incomprehensible small item in his toolbox for a long time. When the iron box practically accidentally "began to light up," it was determined that this small item was a strong radioactive radiation source. The readers began to smile, they said, how unlucky this toolmaker was. Although, as they say, not in any mood to laugh.

Judge for yourself: You are happy that a little boy is enthusiastically involved in a technical club and that the sponsor-aviators gave him written-off navigational instruments and similar such "iron boxes." But they "hum" and contact with them does not add to one's health.

The Chernobyl disaster and the demand to cease testing at the Semipalatinsk Nuclear Test Range have stimulated an increase in the number of participants of the antinuclear movement in Kazakhstan. Radiation-phobia has also appeared and rumors have also begun to circulate that the republic has been transformed into a radioactive waste dump. This is on the one hand. But on the other hand, this is some sort of criminal frivolity of the numerous users of isotopes.

How justified is this conclusion and how do we protect people from random sources of radioactive radiation? Here are several qualified opinions.

V. YAZIKOV—Kazakh SSR People's Deputy and USSR Ministry of Geology's Volkovskiy Geological Production Association chief director.

"In May 1989, the government of Kazakhstan tasked our association to study the radiological situation on the territory of the republic. According to the program that was compiled jointly by the Sanitary and Epidemiological Station, the Kazakh Hydrometeorology Service and the

Ministry of Public Health, we have already studied such cities as Alma-Ata, Karaganda, Semipalatinsk, Ust-Kamenogorsk, Kzyl-Orda, and Chimkent. We have discovered 37 sectors of radioactive contamination.

"As a rule, their causes were instruments and construction and other materials with ionizing radiation that had been discarded because they were no longer needed. Say, during a helicopter flight, a so-called radiation source was detected on the outskirts of Kzyl-Orda that had been lying in the ground at a shallow depth for several years.

"Or take this example. We found a 120-meter long section of road that had been paved with radioactive slag in the area of Semipalatinsk Machine Fitting Plant. And a pile of this slag was lying on the territory of the plant itself. The city authorities, having learned about this, decided to remove it. The slag was hauled away... to a hay field on one of the oblast's farms.

"I must recall in this regard Poet Olzhas Suleymenov's graphic comparison, who once said during a conversation with me: 'Our republic reminds me of an apartment in which there is not even a trash can. And actually everything is thrown away and discarded in it wherever and however it ends up.' But a 'trash can' is simply necessary and with solid walls and a lid. That is, it is a question of constructing long-term radioactive source storage areas in Kazakhstan."

R. SVETLITSKIY—Head of the Republic Sanitary and Epidemiological Station Radiological Department:

"Sanitary and epidemiological stations primarily monitor the radiological situation in the republic's cities and villages. Our service is involved only with those enterprises and institutions where radiation sources are used for production purposes and where they are registered. However far from all enterprises inform us about them. As a result, many sources of radioactive radiation are not monitored. Institutions and organizations themselves write off these instruments and discard them at a dump or dismantle them for parts. And all of this remains unsupervised and poses a danger to people. Here is just one example. For nearly 20 years, 60 radioisotope instruments, that belonged to Yuzelevatormelstroy Trust's Production and Technological Equipment Administration and that have not even been unsealed, have been lying around not far from Alma-Ata.

"We have proposed more than once than we take responsibility for all dosimetric monitoring work. But our proposals do not receive support at the enterprises. Moreover, the leaders of some of them do not at all want the raw materials and materials that they produce to undergo an inspection for radioactivity. Do you see that it is overhead and onerous for them. That disorder may be very expensive for the population."

A. SHAMENOV—Head of the Kazakh SSR President's Department of Ecology and Natural Resources Utilization Staff:

"The problem associated with the burial of radioactive sources has not been subject to widespread publicity for a long time. Information concerning the radiation theme has been held in deep secrecy at various institutions under the 'secret' stamp. And it has turned out that many people, due to their own lack of information and at times disinformation, saw danger where there was none and believed rumors and idle gossip. Thanks to the policy of openness [otkrytost] and an honest dialogue with the population that is being conducted right now in the republic, publicity is being imparted to things that were previously held under the tightest secrecy.

"But the stereotypes of the past are not so easy to break. The republic government already in 1979 adopted a resolution on the construction of long-term radioactive waste storage facilities. But it has remained unfulfilled. Three years ago, the Kazakhstan Council of Ministers once again returned to this problem. And once again the matter has not moved off of dead center. Oblast Soviet ispolkoms, on whose territory they planned to build these storage facilities, cite public opinion and continue to ignore the government's decision, even without trying to conduct explanatory work. In the meantime, as the experience of Canada and the United States shows, these countries obtain the "go-ahead" from the population prior to building something and to do this they conduct a dialogue with the people, consult with them, and explain things to them.

"In short, we need glasnost and the broadest propaganda of knowledge associated with the issues of radiation safety. Here there should not be any kind of secrets from the population. Only then can we count on its understanding and support. Ultimately, construction of long-term radioactive waste storage facilities meets the need to protect people's health."

Let us add: There are increasingly fewer "white spots" and restricted zones on journalists' paths, however, try to find out in more detail about the activities, for example, of semi-mythical Rodon—a specialized organization which, according to rumors, carries out the collection and utilization of radioactive wastes in our country. Here the "top secret" stamp has confused the issue that, in our view, it has not so much hidden as much as it has given rise to horrible rumors, conjecture, and suspicion. And as can be seen from just the small number of facts cited, they are very often unfounded.

So, openness [otkrytost] of information is needed on the activities of specialized services. This will make them subject to the control of public opinion, will permit us to reliably protect people from the consequences of disorder, and charge those guilty for the disasters we discover. We need to face facts: We do not need to stop progress and we cannot get by without the varied uses of those same radio isotopes. Say, the amount of exploratory drilling in Kazakhstan right now is high (and it will increase significantly) during which the log survey exploration of countless wells is conducted. And an instrument with a radioactive source is lowered into each one.

For now people are only afraid of the word combination "buried radioactive wastes" and this causes a feeling of protest and an understandable lack of desire to live anywhere nearby. However, dangerous waste storage areas are simply necessary. And the more reliable they are, the calmer our souls will be. The world experience of their construction and content suggests: we need to locate burial sites at significant depths in hard and salt rock which withstand earthquakes very well.

And one more thing. It has so often occurred in Kazakhstan that quite a bit of land that has already been contaminated by various types of testing has been taken out of circulation for a long time. Maybe we need to locate the burial grounds here without hiding either the danger or the urgent need for these types of facilities from the people. According to our current "market" times, we need to pay for everything and in the literal sense of this word. Consequently, material compensation for the location of the "trash can" in some or other small corner of the republic will only be fair.

### History of Disasters at Chelyabinsk Mayak Nuclear Plant

91WN0648A Moscow MOSCOW NEWS in English  
No 19, 12-19 May 91 p 10

[Article by Andrei Borodnikov: "Chernobyl Wasn't the First!"]

[Text] There's no better way to fan passions around political issues than to offer construction of yet another nuclear power station now, after having experienced the Chernobyl disaster. The wave of these passions heaved, swelled to the size of a tidal wave, and, on its crest, carried many activists of the green movement into every level of government. In the case of Chelyabinsk Region, this fear has its reasons. People call the Region "The Urals' Hiroshima" because of its Mayak (Lighthouse) plant—the first of the Soviet nuclear industry. Nonetheless, it looks like the region will get the nuclear reactor after all.

### The 'Lighthouse'

The story started back in the late '40s when the first Soviet nuclear reactor for the production of weapon-grade plutonium was commissioned in a place a hundred km outside Chelyabinsk. The Plutonium went to fill the bombs, and the waste was dumped into the Techa River. Local residents didn't know it and continued to get water from the river, swim in it, catch fish, and herd their cattle down there to drink. Some obscure accident happened there in 1951. To every appearance, it was not a trifling affair, if an imposing team of experts from Moscow was rushed to that Urals backwater at that postwar time devoid of sentiment. Soon afterwards, villages in the vicinity of the Mayak integrated works were frequented by local bosses and ranking visitors from Moscow who proposed that local residents move elsewhere, for a 600-ruble compensation. No reason was given.

Now we know the reason: 124,000 people were exposed to huge amounts of radiation and got doses as high as 170 rems each (100 rems cause chronic radiation disease).

Another disaster happened in the fall of 1957: one of Mayak's waste capacities blew up, venting into the air an equivalent of almost half the Chernobyl dose. The resulting radioactive cloud covered an area of 23,000 square km containing 217 villages and 270,000 people. This was dubbed the East Urals Radioactive Trail, EURT. Apart from the Chelyabinsk Region, it affected the Sverdlovsk and Tyumen regions. Once again the residents of areas in the upper reaches of the Techa got the largest doses.

According to rough estimates, 450,000 residents of the Region suffered from the Mayak works.

### Camera Obscura

I heard some optimists say: "There were misdoings in the past. But now it's different. Over 10,000 people were resettled from the territory of the EURT. We're working to make the soil tillable again. We're studying mutations among plants and animals. As many as 7,500 people have been resettled from the upper reaches of the Techa. The river itself has been fenced off by barbed wire and is guarded by militia posts. The sources of the river, where Mayak dumped its waste, have been sealed off by several dams."

But I also heard pessimist voices. The Techa is contaminated not only in its upper reaches, but throughout. The contamination continues, partly due to underground seepage from Mayak's storage ponds and partly due to local bogs which absorbed a lot of radiation and are now feeding it gradually to the river. People continue to use the river and grow contaminated food which they eat themselves and ship to the city. Not a single large village has been evacuated, because it is too expensive to resettle large numbers of people. Only small villages were evacuated, and people were offered prefab flimsy constructions to live in. Many of these houses are decaying rapidly.

The unique region where people were exposed not only to outside irradiation, but where for 40 years radiation has been introduced to human organisms with food and concentrated in the body tissues, was studied in a way which precludes correct assessment of the extent of the catastrophe. How are the people to be helped, and what's to be done with Mayak?

### Encounters With the Devil

Chelyabinsk-65 is the administrative centre of the Mayak integrated works, 100 kms outside the city of Chelyabinsk. The township is neat and prudent-looking, like the socialism we failed to build in the country. The percentage of people who have to share their apartments with others is particularly low here, but the percentage of people who have cars is almost as high as in the United States. This town of 80,000 has three cinemas, three Houses of Culture, a splendid Drama theatre, a higher school, and ... two cemeteries.



Those who believe that atomic energy workers are a snooty and rich lot who are guilty of fouling up the land (and this is the belief of, perhaps, everyone in the Chelyabinsk Region) don't know the price these people have had to pay for their seemingly affluent lifestyle. The first batch of plutonium was produced almost with their bare hands. The workers were rushed, and the radiation safe dosage thresholds were simply ignored. As a result, about 20,000 workers with overdoses had to be replaced within the first five years of operation. When the matter of extra pensions for the Mayak veterans was discussed recently, it turned out that there were as few as one hundred-and-fifty of them still living.

Waste dumped into Lake Karachai and which has been seeping into the water table below (which can any time burst into Ob River tributaries) contains the radiation equivalent of two and a half Chernobyls. Almost 20 Chernobyls are contained in the capacities like the one which blew up in 1957. There are another 200 burials with 500,000 tonnes of solid waste, and half a billion cubic metres of contaminated water in a group of artificial ponds in the upper reaches of the Techa, and these will start spilling over in another year or two. In addition, there are 23 tonnes of now useless but nevertheless highly dangerous plutonium there.

The concentration of radioactive material there knows no precedent in the world's practice. The situation demands equally unprecedented steps to cope with it. But who must take the steps? The answer seems to be easy: those guilty of creating this mess. Mayak experts came up with a suggestion: let's build an APS there.

#### Like Cures Like

It was a shock followed by a fit of rage. The quiet and complacent residents of the Chelyabinsk Region have changed their attitude and started to protect, picket and show their anger. They seem to have no doubt that the ministry has yet another perfidious act in mind: "It is not enough for them to screw up the Region. They want to ruin it completely."

The "greens" were winning over their rivals in the elections hands down, using this simple argument, and the "greenest" of them got into the governments at higher levels. Stones were hurled at the APS project from rostrums of various parliaments of the country. The voices arguing for the project were drowned in the general hullabaloo. They were meek voices of the managers of the Mayak integrated works: "We want to have it built not in Chelyabinsk but near Mayak where we ourselves and our children and grandchildren live, which would preclude an adventurist approach or careless breakdown of the APS." And better argued voices from the expert commissions: "The APS will supply energy which will be used to evaporate water from the contaminated ponds, which would turn liquid waste into solid waste which, in turn, could be used as fuel for reactors. Thus, the APS will be a 'furnace' to 'burn' the plutonium and will consume the fuel waste of APSs in the USSR and abroad. Besides, this

station will bring 500 million roubles of profit annually, which can be spent for the general ecological and social rehabilitation of the area."

Only a year later when the passions subsided somewhat, the opponents of the APS project realized that they need not only protest against the project but also seek a solution. They searched for an alternative, but couldn't find one. What to do next? There wasn't any more time to be spent to continue the search. But to agree to the construction of the APS would mean to lose face. It was an impasse for the new regional administration and for the atomic energy department. However, a compromise had to be found, because neither party wanted to live "on a volcano." Both parties suddenly realized that the System should pay the losses. The demonstrations must be well coordinated. The weight of the opinion of the country's heaviest industrialized region and the weight of the opinion of the influential Ministry of the Nuclear Power Industry together will enable them to put out a demand, rather than a plea. But what is to be demanded?

The authorities put out a condition: first come the ecological and social rehabilitation programmes approved on the top, a law introducing a special status for the zone, monetary compensation for the victims, emergency investments into the social sphere of the areas hit by radiation, and only then come the actual construction of the APS and start of the reactors. The Ministry agreed to the condition, perhaps, grudgingly. As a result, drafts of these documents have been worked out and tabled for discussion at the USSR and Russian Federation parliaments.

Could we call it a happy end? Unfortunately not. Suppose, the parliaments pass the legislation and make the government pay the debt. What next?

I asked First Deputy Chairman of the Chelyabinsk Region Soviet executive committee, Lev Stobbe, author and ardent supporter of all the programmes and projects aimed at rehabilitation of the region: "Do you count on getting 32 billion roubles, 16 billion of which in hard currency, from the budget which, according to the calculations, the state must pay for the harm done to the environment and people?" I got no answer.

Chernobyl's fate was "luckier." That tragedy happened at a time when it couldn't be just swept under the rug and the victims just abandoned. Chernobyl got the universal sympathy, foreign relief aid, and even a rehabilitation programme worth 20 billion roubles. Those guilty (at least some of them) for that tragedy have been identified and punished. As for the catastrophe in the Urals, the matter of responsibility for it hasn't even been brought up. They are letting bygones be bygones. The present mistakes are written off as byproduct of the economic difficulties. So far, the future of the "lighthouse" is shrouded in a fog.

#### Chelyabinsk Researchers Develop Decontamination Methods

*PM1608115791 Moscow Central Television Vostok  
Program and Orbita Networks in Russian 1530 GMT  
13 Aug 91*

[From the "Vremya" newscast: Report by S. Sergeyevev and S. Gordiyenko, identified by caption]

[Text] [Announcer] One of our fatherland's problems is that we, its citizens, know too little of what's going on there. I am above all referring to the fact that a great deal in our country was marked "Top Secret." Time provides the answers to many questions—as is the case in Chelyabinsk. But you'll agree that sometimes delay is like a crime.

Everyone is probably aware that there is another reserve in Chelyabinsk Oblast in addition to the well-known Ilmenskiy [nature] reserve—a nuclear reserve.

[Sergeyev] The appearance of this unusual reserve—there are simply no others like it in the world—was preceded by a sad event that was hushed up for a long time. In 1957 there was an explosion at the Mayak chemical combine—a major defense enterprise producing plutonium weapons. The result was that a vast tract of land, 105 km long and 9 km wide, was contaminated with radioactive elements. Part of this nuclear trail—roughly 17,000 hectares—was assigned to the Vostochno-Uralsk State Reserve.

Entry and exit are strictly restricted. Only personnel from the Mayak chemical combine's experimental research station are allowed free access. The reserve represents a unique testing area for them, where they can study the effect of radioactive substances on the natural environment—plants, animals, insects, fish, birds. Their work focuses on seeking ways of decontaminating the contaminated soil and developing technology that will make it possible to bring back into cultivation the land once subjected to massive radionuclide attack.

[Candidate of Biological Sciences D.A. Spirin, identified by caption] The results of our work at the experimental base formed by the Vostochno-Uralsk State Reserve have been revealed—the basic principles governing the behavior of radionuclides in plants' soil system and subsequent components of the environment. Among other things, we have discovered the principles governing the behavior of strontium-90 as the main pollutant in agricultural crops' soil systems. Practical methods have been developed on this basis that will make it possible to carry out agricultural production in the midst of radioactive contamination. These methods will be applied on land taken out of cultivation following the accident. This represents an area of more than 100,000 hectares. Literally a few years after the accident this land is once again getting involved in the agricultural cycle. To date 82 percent of this land has been brought back into cultivation again, using these practical methods.

### Greens Campaign Against Radioactive Ore Storage in Krasnoufimsk

91WN0595D Moscow TRUD in Russian 9 Jul 91 p 4

[Article by V. Ponomarev, editor, Krasnoufimsk city newspaper entitled VPERED—for TRUD: "Death Beyond the Boarded-Up Enclosure: Intervention Is Needed"]

[Text] From reminiscences:

"We moved here and settled down in 1958; at that time grain was stored in the warehouses. Later it was hauled

out, and containers began to be put in there. People unloaded them day and night. Dust arose in a column. It sometimes happened that people ate their dinner right there on the containers. Nobody even suspected that the "nonferrous metal" ore, as it was designated in the documents, was lethally dangerous.

"First a horse collapsed, and its hair fell out. They ordered it to be buried. Then one of the women fell ill with cancer and quickly died. At that time I was a strong young man with a sports rating. I began to feel a terrible heaviness in my body. There were times when I bled from my nose and my ears; and my hair began to fall out.

"I quickly went to Kharkov, where my uncle was working as a neurosurgeon. And he saved my life. But I did not succeed in completely recovering my good health. And I arrived back home as an invalid." (N. Bondarenko).

"At times the containers broke, and the substance was shoveled up into paper bags. We did not know about the danger involved, and so we took no precautions. It was only later that instructions appeared, protective gear was handed out, along with dosimeters, and facilities for taking showers were set up." (T. Khomutnikova).

"We became alarmed when my husband began to complain about terrible headaches and sleeplessness. In 1961 he became ill, underwent treatment at a hospital, and went back to work. Nevertheless, in 1965 he was accorded the status of an invalid, i.e., a disability. No matter where we went for treatment, they could not cure him. His vision got worse; his memory declined; his hair and teeth fell out. (on 9 April 1966 V. Spitsyn, a former frontline soldier and a 42-year-old facility chief, died" (A. Spitsyna).

"We even used to taste that substance; it was a lot like bird-cherry meal. People loaded vegetables into the empty railroad cars and hauled them away somewhere. In 1965 they stopped delivering the substance, since the warehouses were completely full" (N. Petukhov).

These and other items of testimony have been collected by N. Serebrennikova and N. Yegarmina, activists in the "Green" movement who are struggling for the removal of the warehouses containing radioactive ore located near Krasnoufimsk.

The railroad from Moscow to Siberia passes through this rather small town in the Urals. Of course, when the passengers look out the railroad-car windows at the 20 or more warehouses beyond the boarded-up fence, they do not suspect that this is the so-called "Stone Belt," until recently a secret facility of the Pobeda combine. Rumors have been circulating around it; they are caused by the severe illnesses and deaths of the people who used to work there. But the facility was a closed zone for decades, and nobody knew what was really there.

This silence was broken by the local newspaper entitled VPERED, which published some letters about the facility's lethal contents. The public began to seethe, and the local authorities demanded explanations from those in charge of the warehouses—the Main Administration for Material

Resources (GUMR) under the USSR Council of Ministers. And just last year a commission arrived from Moscow, headed up by G. Koliberda, chief of GUMR's Fifth Division. Inhabitants of Sverdlovsk and Krasnoufimsk were included in this commission. Such an impressive delegation arrived at the warehouses.

In the courtyard we were met by a guard dressed in a protective, khaki-colored pea-jacket but without a weapon. We were even amazed at how much of a kind of secrecy there seemed to be.... We walked between the warehouses, which had already become delapidated. They were built before the war by prisoners, and they were finished by German POW's. This facility turned out to be temporarily closed; the staff amounted to four guards and a chief.

But the most unpleasant things were what awaited us indoors. I must confess that a cold chill ran down my spine; it was as if I physically felt my entire body being penetrated by invisible rays. The warehouses were chock-full of piled-high stacks of containers containing paper bags filled with a cinnamon-colored, sandy type of material. This is a concentrate of the radioactive substance thorium. Some of the containers had been crushed, and the "sand" had spilled out of them. The radiation level was very high. As the specialists explained, my dosimeter registered a radiation dose allowable for 48 hours. But we had been inside for only 10 minutes.

At the conference which was held later the conversation proceeded in excited tones. The local authorities persistently demanded that the facility be removed—the probability of an accident was too great. The Zyuraya Railroad Station is located right alongside. Suppose something should suddenly tear loose; as you know, such things do happen in our railroad stations and yards. In that case, thorium would be scattered all over the surrounding area. Or suppose that the warehouses were inundated in the springtime by the Ufa River. Already now the groundwaters seep through the floor there; the warehouses are situated on a swamp. And right next to them are the warehouses of Agropromkhimika, the loading platforms of the Krasnoufimskiy sovkhov, and an onion-processing plant. Anything might happen there too.

The guard is symbolic; there is no protection against fire; any good hurricane—and they are not rare in our region—could overturn or flatten these aging warehouses. And then the radioactive dust would fly all around. However, the representatives from the GUMR stood their ground; although they did not exclude the possibility of an accident, they said: "We will not touch this ore."

The city- and oblast-level newspapers have spoken out on this matter more than once; there was a protest meeting in the city's central square—a meeting at which thousands of signatures were collected. Letters have been written and sent to all levels of authority. At the 7 November and 1 May demonstrations the most popular slogans were: "Down with the 'Stone Belt'" and "Better To Be Active Today Than Radioactive Tomorrow."

From time to time certain commissions arrive in Krasnoufimsk; they write something in reports there, which is

not communicated even to the local leadership; but nothing is changed. Meanwhile, the danger from the lethal warehouses increases from month to month—as they get older and more and more apt to collapse or be destroyed. What size of disaster awaits the inhabitants of Krasnoufimsk? Will it be their own kind of "little Chernobyl"?

And what is really strange is the following question: Is it possible that our country does not need this ore, containing a whole range of rare-earth elements, for which the widest use could be found? If we do not need it ourselves, we could sell it abroad. At worst, we should bury this thorium in a secure place, while observing all the rules pertaining to such matters. Any of the above-mentioned steps would be better than keeping this entire city and several villages in a state of tension. Their population feels that they are living in a minefield which is just about to explode.

### **Nuclear Contaminated Vessel Removed From Lake Ladoga**

*OW0708222991 Moscow INTERFAX in English  
1100 GMT 7 Aug 91*

[Following item transmitted via KYODO]

[Text] An expedition of the Leningrad naval base has lifted a contaminated vessel from Lake Ladoga. The KIT destroyer was built in Germany in 1940 and it was the fastest German naval vessel. After World War Two it was given to the USSR under the program of reparations and became a test ship.

In 1951 it was contaminated during tests of nuclear weapons. After that the sealed ship was sunk. It is believed there still was a danger that radioactivity could leak from KIT into the lake.

### **Lithuania Rejects Transfer of Ignalina Power Engineering to USSR Ministry**

*LD1308045391 Vilnius Radio Vilnius Network  
in Lithuanian 1600 GMT 12 Aug 91*

[Text] In compliance with the order of 11 July 1991 issued by the USSR Ministry of Power Engineering and Electrification and the USSR Ministry of Nuclear Power Engineering and Industry concerning centralized accounts by nuclear power stations in the future, the power engineering at the Ignalina Nuclear Electric Power Station will be exempt from the balance of the Lithuanian power engineering system and transferred to the USSR Ministry of Nuclear Power Engineering and Industry Main Administration No. 27.

This order was sent to the Ministry of Power Engineering of the Republic of Lithuania, and was then sent on to the government of the Republic of Lithuania.

Deputy Prime Minister Vytautas Pakalniskis sent a letter to the leaders of the above ministries in which it is indicated that the order concerning centralized accounts by the nuclear power stations was issued despite the objections of the Ministry of Power Engineering of the

Republic of Lithuania. The order has not been coordinated with government of the Republic of Lithuania.

Pakalniskis points out in the letter that such an order is the start of destruction of the systems of power engineering and that it compels Lithuania to doubt the promises made by the leaders of the ministries of the Soviet Union to continue cooperation in the sphere of power engineering.

At the end of the letter, it is stressed that if Lithuania is compelled to take retaliatory measures, then all the responsibility for possible consequences will fall on the USSR Ministry of Power Engineering and Electrification and the USSR Ministry of Nuclear Power Engineering and Industry.

### Data on Deforestation Caused by Industrial Air Pollution

91WN0596A Moscow VESTNIK STATISTIKI  
in Russian No 6, Jun 91 pp 57-59

[Unattributed report under the rubric: "New Information From USSR Goskomstat: Loss of Forests From Industrial Pollution of the Atmosphere"]

[Text] Industrial emissions are doing tangible damage to the forest products industry. Every year this factor results

in the loss of roughly 60,000 hectares of forests, and that is almost one-third the area of forests which dry up within a year for any reason, including damage by insect pests, diseases, wild animals, and other factors.

Based on the pressing nature of the problem of the destruction and loss of forests from emissions of harmful substances into the atmosphere, USSR Goskomstat conducted a special sample survey on 1 October 1990. It was conducted at state forestry stations, timber procurement establishments, and other forestry management enterprises of the USSR Goskomles [State Committee for Forestry] and the USSR Minlesprom [Ministry of the Timber Industry] systems located in 33 oblasts, krais, and ASSR's of the RSFSR, the Ukraine, Belorussia, and Kazakhstan as well as Lithuania, Latvia, and Armenia. As a rule forestry management enterprises lying near industrial cities were included.

The survey showed that there were forests which had become weakened or died in response to harmful emissions on the territory of 218 of the 305 enterprises surveyed. The following data (on the enterprises surveyed) characterize the destruction and loss of forests from these emissions:

Table 1. Destruction and Loss of Forests from Harmful Emissions

	Area, in thousands of hectares		Reserves, in millions of cubic meters	
	In All	Including Coniferous Forests	In All	Including Coniferous Forests
Forests Damaged and Lost Since the Start of Observation	854	830	47.4	46.6
Including Forests of the First Group	848	825	46.3	45.5
Dead Forests Felled at the Moment of Inventory	30	28	2.7	2.5
Existence of Damaged or Dead Forests at the Moment of Inventory	782	759	39.2	38.5
Including:				
Weakened or Severely Weakened Forests	461	441	19.7	19.1
Dead Forests (Drying Up or Dried Up)	321	318	19.5	19.4

The green zones around cities and other specially protected forests were most affected by harmful emissions—848,000 hectares (99 percent of the total area of damaged forest stands). They perform chiefly water conservation, protective, hygienic, and health-restoring functions (forests of the first group).

Coniferous forests are the most sensitive to emissions of harmful substances. This factor has damaged 830,000 hectares of them or 97 percent of the area of weakened or dead forest stands, including larches—566,000 hectares (66 percent), and pines—198,000 hectares (23 percent).

Industrial emissions resulted in a decline in the net increase in felled timber and in forest quality. In 1989 the damages from the loss of the commodity value of timber amounted to 4.3 million rubles or about 75 percent of its estimated standard value.

As a result of felling, partial reforestation, or transfer of areas with dead stands for construction, agriculture, and other nontimber economic uses, at the moment of the inventory damaged or dead forests in fact amounted to 782,000 hectares, or 1.3 percent of the total forested area of the enterprises being surveyed.

Forests were damaged to the greatest degree in the Bratsk, Krasnoyarsk, Sverdlovsk, Nickel and Monchegorsk (Murmansk Oblast) regions, as well as in a number of cities in Chelyabinsk Oblast (Verkhniy Ufaley, Troitsk, Satka, Karabash, and Katayev-Ivanovsk).

Data on the existence of damaged or dead forests for the individual regions are cited below (for the enterprises surveyed):

**Table 2. Damaged and Dead Forests by Individual Region**

	Area		Reserves, in millions of cubic meters
	Thousands of Hectares	Percentage of the Total	
In All	781.7	100	39.2
RSFSR	770.4	98.6	37.0
Murmansk Oblast	82.5	10.6	1.3
Sverdlovsk Oblast	14.2	1.8	2.4
Chelyabinsk Oblast	16.5	2.1	2.3
Irkutsk Oblast	77.8	10.0	7.9
Krasnoyarsk Krai	565.2	72.3	21.2
Ukrainian SSR	3.1	0.4	0.5
Lithuanian Republic	7.2	0.9	1.6
Belorussian SSR, Kazakh SSR, Republic of Armenia	1.0	0.1	0.1

Such toxic substances contained in industrial emissions as sulfur dioxide, carbon monoxide, nitric oxide, and fluoride are especially deadly to the forest.

The following are the main offenders in terms of the harmful emissions which resulted in suppressed vital activity and destruction of forests: the Pechenganikel (city of Nickel) and Severonikel (city of Monchegorsk) metallurgic combines, the Norilsk Metallurgic Combine, the Bratsk Aluminum Plant, the nickel combine in the city of Verkhniy Ufaley, the copper smelting combine in the city of Karabash, and other enterprises.

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### Sulphur Emissions From Kola Nickel Smelteries Increasing

*LD1508210191 Helsinki Suomen Yleisradio Network in Finnish 1500 GMT 15 Aug 91*

[Text] [Announcer] The sulphur emissions from the Kola smelteries have continued to increase at the same time as the Finns have had talks with the Soviets on modernizing the smelteries. According to Soviet scientists currently visiting Lapland, the sulphur emissions from the Monchegorsk production plants rose during last year by as much as 40,000 tons. The scientists think that the emissions from the production plants have at least remained at the previous level. Marjatta Rautio reports:

[begin recording] [Rautio] Finns have during the past couple of years been engaged in intensive talks with the Soviets on the modernization of the Kola nickel smelteries. Hopes for a speedy reduction in the massive sulphur emissions, which are causing concern in both Finland and Norway, have already run into the sand in the course of the slowly-progressing talks. At the same time as mutual understanding has been sought on the modernization of smelteries, the sulphur emissions in the Kola area have

increased further. What amounts of sulphur do the Kola plants now emit into the air? This is how (Igor Baraketchov), assistant director of research of the Lapland protection area, situated near the town of Monchegorsk, describes the situation in the town.

[Baraketchov] According to forecasts it will be 250,000 - 260,000 tons, according to the data provided by our supervisory bodies.

[Rautio] According to (Baraketchov), the Monchegorsk sulphur emissions already rose to this level last year. Thus the emissions have risen from the levels of the late 1980's by as much as 40,000 tons. The Soviet scientists currently visiting Lapland do not have exact information about the sulphur emissions of Pechenganikel, situated further north, but the direction at Pechenganikel, too, is clear. This is what (Vladimir Zolotukhin), director of the Lapland protection area, says:

[Zolotukhin] Nothing is decreasing there. Not a single one of our enterprises has reduced emissions.

[Rautio] The poor economic situation of the Soviet Union has, according to the scientists, meant that the outdated factories, creaking at the joints, are now processing poor-quality ore in an attempt to achieve even greater productivity. Scientists also blame the plants for deliberate negligence. The scientists, who are concerned over the situation, recently publicly demanded a reduction in output in order that the sulphur emissions could be reduced. The factory directors were, however, totally negative toward the demands. The Severonikel combine has even been threatened with a fine of 11 million rubles unless it reduces emissions.

Because of the increasing emissions, the picking of berries and mushrooms has been banned in the surroundings of the town of Monchegorsk this autumn. A ban was imposed for the first time two years ago. The centralized buying of berries and mushrooms has ended, but the scientists say that it is difficult to convince individual people of the seriousness of the situation. [end recording]

[Announcer] The increased sulphur emissions in the Monchegorsk area have raised the total sulphur emissions in the Kola area to over 60,000 tons [as heard] per year.

### UN Help Sought in Curbing Construction of Siberian Hydroelectric Facilities

*91WN0596B Moscow ROSSIYSKAYA GAZETA in Russian 9 Jul 91 p 3*

[Article by Valeriy Yaroslavtsev: "The 'Mines' on the Siberian Rivers: Where the Construction Projects of the Century Are Leading Us"]

[Text] The supposed low cost of the largest hydroelectric power plants in the world on Siberian rivers is now resulting in ecological disaster, degradation of the indigenous population, and the withdrawal from use of thousands of hectares of taiga and agricultural lands.

No one has borne responsibility for the impending catastrophe from the time of industrialization to the present. For that reason, obviously, the Siberians have decided to appeal to the United Nations. But will that help?

#### The Ust-Khantayskiy GES

This is the northernmost hydroelectric power plant in the world. The machine room was cut in rock at a depth of 47 meters. But the level of the Khantayskiy Reservoir is lower than planned. The permafrost is being eaten away because of the great amount of water filtration. From the day it was brought permanently on line, the Ust-Khantayskiy GES [hydroelectric power station] has simply not produced the projected amount of electricity.

#### The Kureyka GES

In late December 1989 the fourth unit of this plant near the Arctic Circle, which by that time had produced its first billion kilowatt hours of electricity, was put on line. The fifth and last unit has been set in and is to be launched next year. The GES can produce 2 billion kilowatt hours of electricity every year, but it produces only half that. The excess water from the reservoir has to be discharged unused over the crest of the dam. The plant, which was intended as the main source of power supply for the Norilsk industrial region, has been under construction for more than 15 years. During that time Norilsk residents have received energy for themselves from central heating and power plants and can only receive energy from two of the AES [nuclear electric power station] units. True, Turukhansk needs electricity. The Turukhansk residents just recently got the capital from USSR Minenergo [Ministry of Power and Electrification] to build an LEP-220 [electric power transmission line]. People in Igarka would also like to change their heat supply to electricity, but once again Minenergo asked such an exorbitant price per kilowatt that it was cheaper to haul coal from the "mainland."

The unfinished power plant works at half strength, while the Krasnoyarsk Hidroproyekt [hydro planning organization] has already begun technical-economic substantiation for construction of the Upper Kureyka Hydroelectric Power Plant.

#### The Turukhansk GES

The plan to construct this gigantic plant with a capacity of 20 million kilowatts on the Lower Tunguska caused mass protests of the region's residents and a furious three-year debate in the country. Both the public and scientists assessed the substantiation (TEO [technical and economic substantiation]) for the construction presented by Lengridroproyekt as an ecological and ethical catastrophe. The project in fact might ultimately result in the disappearance of the Evenki people, and so the ispolkom of the Evenki District Soviet justifiably refused to consent to the TEO at dam elevations of 200 and 140 meters. At the instruction of the USSR and RSFSR councils of ministers, in the summer of 1988 the Siberian Department of the Academy of Sciences conducted a comprehensive ecological and socioeconomic expert study of the future project. The

presidium of the Siberian Department of the USSR Academy of Sciences agreed with the findings of the expert commission headed by Academician A. A. Trofimuk and adopted a resolution to recommend no construction. Meanwhile, without waiting for the expert study, the hydroelectric power plant builders began to build a road and an LEP from Svetlogorsk to the location of the future plant's dam, but the people stopped construction. Yu. Semenov, the minister of power engineering and electrification, announced that the question of the Turukhansk GES would be put off until the year 2000, but planning work continues.

#### The Middle Yenisey GES

After decisive protests by the public and scientists against construction of gigantic hydroelectric power plants on the Yenisey, the planners of Hidroproyekt did just the opposite. Instead of one Middle Yenisey GES with a capacity of 6 million kilowatts, they proposed constructing a whole series. The belief is that this will help reduce the area of drowned valuable agricultural lands to less than half. But there still has been no public expert study. And what is more, ecological scientists believe that there should be no hydroelectric power plant-obstructions on the Yenisey in order to avoid unpredictable global ecological consequences. Construction of medium pressure GES's is possible only on the tributaries of the Yenisey, but the "povorotchiki" [scientists who in the past proposed reversing the flow of large Siberian rivers] continue to strive to curb the great river.

#### The Boguchanskiy GES

Long-term construction of 15 years here. But the rate of construction did not speed up at all after the Angara was spanned in October 1987. The time periods for launching the first units have been carried over several times. Now 1995 has been named. How can launching be planned if there have still been no decisions on the formation of the Lower Angara Territorial-Industrial Complex?

And the ecological situation in the Angara region is deteriorating. Agriculture has declined and a centuries-old way of life is collapsing. About 20 populated points will fall in the drowned zone, and that includes the former rayon center of Kezhma, an ancient Angara village founded by Russian pioneers many years ago, in 1665. Roughly 30,000 hectares of farm lands and valuable floodplain lands and 126,000 hectares of forests which will rot will go under water; thick deposits of hard coal and iron ore will be drowned. The Angara will form a fourth artificial sea and will cease to exist as a river. It will become a swamp. But why do it? Even now one must not drink the once-clear Angara water or swim there, nor can one eat the fish. The channel is becoming stagnant.

In mid-1989 the residents of Kezhma and other Angara villages set up an initiative committee to save the Angara.

People are against the construction projects of the century. But they are already tired of fighting with the supporters of those projects. After letters to M. S. Gorbachev and to the

USSR Supreme Soviet, the President's correspondence was published, giving instructions to "examine the matter and finally clarify it." But there still is no clarity. O.S. Shenin, the former first secretary of the Krasnoyarsk Party Kraykom (and now secretary and member of the CPSU Central Committee Politburo), and L. A. Voronin, the first deputy chairman of the USSR Council of Ministers, have already given their word to the country's President "to envision in a short time..." and so on and so forth.

The Angara region inhabitants call all this "obvious disinformation." The joint expedition along the Angara in June 1990 of the kray environmental protection committee, the Academy of Sciences Siberian Department, and Hidroproyekt was pursuing the strictly departmental interests of Minenergo. In confirmation of its order of 10 November 1989 No 344, which authorized the Boguchanskiy GES for the list of priority construction projects, the department is stepping up construction of the dam, despite the protests.

Where else can people turn? Now they have come to the idea of calling on the United Nations. But will the UN help the despairing inhabitants of the Angara region? There is no state program to save Siberia. As a monopoly Minenergo is preparing a program to introduce new hydroelectric power plants by the year 2000. One hundred large and small hydraulic power systems are planned with a total capacity exceeding the existing capacities by a factor of 2.5. New hydro-mines are being laid in the plan.

### Greenpeace Begins Pollution Study in Western Siberia

91WN0617B Moscow IZVESTIYA in Russian 22 Jul 91  
Union Edition p 3

[Article by IZVESTIYA Special Correspondent V. Kostyukovskiy: "Greenpeace' in Western Siberia"]

[Text] What attracted Greenpeace to Western Siberia? Doctor M. Hoffmann, a Greenpeace associate from the FRG, explained:

"We are wherever it is in a bad way and where there is hope of saving something. In this sense, Greenpeace does not know any borders. Really, pollution and contamination of the world does not know any borders and this is our common misfortune and pain. But Western Siberia and the conditions of its environment, especially of the Siberian rivers, increasingly concerns scientists and public opinion in the West. We do not know enough about what is occurring here. We only know what the Ob dumps hundreds of harmful admixtures into the Northern Arctic Ocean. And there is one World Ocean for all of us. We see that these problems are troubling the residents of Siberia to an even greater degree: both workers, leaders, and journalists.

Yes, Western Siberia has long ago become one of the major conglomerates of raw material and resource-intensive sectors of industry on the planet: coal and oil extraction, petroleum refining, metallurgy, chemical, and even the nuclear sectors. Many years of neglect of the ecological aspects of economic activity and the physically obsolete

production technology—all of this has resulted in the fact that the region has become one of the largest environmental polluters in the world. And this is fraught with truly irreparable consequences. Already right now the incidence of disease of Siberian residents is higher than for residents of the European portion of the USSR. One can even talk about the ecological genocide of the peoples that are not numerous: the Shor, Teleut, Selkup, Khant, and Mansi peoples. The barbarous methods of extracting coal and oil and processing timber are leading to premature exhaustion of their reserves. Intensive lowering of the ground water level is occurring in Kuzbass. Naturally, ecological issues are increasingly becoming a part of policy, including in foreign policy, and a topic of concern of people's diplomacy.

Expedition participants have set as their task the conduct of a comprehensive study of the water environment of the Tom-Ob Basin and also the drinking water in the cities and villages on their banks. The route, which began in the Kuzbass, leads northwest through Tomsk and Tyumen oblasts and Khanty-Mansiysk and Yamalo-Nenetsk Autonomous Okrugs right up to Salekhard. Yu. Kaznin describes the work methods:

"Michael Hoffmann and one other Greenpeace specialist Dutchman Vitse van der Haald brought microprocessing instruments and other equipment with them for express-analysis. However, we have known for a long time that express-analysis using any equipment does not provide answers to many questions. Only thorough decipherment of water samples in laboratories can answer them. We are conducting these tests at the Western Siberia Regional Ecological and Medical-Biological Research Center. This is a subdivision of a worldwide laboratory. However, even here, we cannot do everything due to a shortage of equipment, reagents and, finally, the most elementary laboratory vessels. That is why the next stage is work with water samples in Western European laboratories. We constantly sense the great attention of local authorities, scientists, and environmental protection service workers and we are storing up the data from many years of observations in order to compare our results later.

Attention and a proprietary, interested attitude was sensed, for example, in meetings with the leaders of Rapsadskaya Mine and the city soviet of people's deputies at Mezhdurechensk. Having learned that an expedition had arrived in the city, Hunting Guide Sergey Kostyuk and Mezhdurechensk Forestry Engineer Yevgeniy Kalugin donned their boots, grabbed their rucksacks, and came to us to offer their help. We traveled on foot in those places where there are no roads (and the weather did not permit travel by helicopter) to take water samples from the Tom and Belsa. The Greenpeace people traveled in boats from Novokuznetsk to Kemerovo along with Western Siberia Center Executive Director Sergey Sergeev and his coworker Andrey Kravchuk. Our colleagues obtained exhaustive information from Oblast Environmental Protection Chairperson O. Andrakhanova.

And here are examples of another approach. One of the leaders of Kuznetsk Metallurgical Combine was quite

frank with us in the spirit that "Greens" have gotten out of hand: "You see there is nothing for them to breathe." In his opinion, you do not need to breathe but to work in the plant's shop. And whoever does not like the air, let them move to the country, he said, we are not holding anyone here.

One more example from another sphere, although of that same type. Scientists of the Siberian Department of the USSR Academy of Sciences at Tomi have detected dioxins—an extremely harmful substance that affects a man's genetics. However, there is no open information about this yet although the law obliges them to provide this information without delay. This is explained by the fact that the results of the research are allegedly the property of the customer who ordered them. And the customer is vitally interested in blocking the Kuzbass' main river with a dam and it is extremely unfavorable to publicize it. How much dioxin is in the water? Where is its source? Answers to these questions require complicated and expensive research. We hope to obtain them at Greenpeace laboratories in the FRG and Netherlands.

What do the foreign participants say about their impressions? They are tactful, restrained people who regard our problems with understanding and only sometimes do they display their emotions without restraining themselves. I caught sight of the unfinished Greenpeace Krapivinskiy Hydrosystem. This "construction of the century" has been conducted for many years and was announced at one time as "ecological." The idea of customers from the previous Ministry of Land Reclamation and Water Resources and Kazgidroproyekt designers was quite primitive—to build a gigantic "wash tank" on the Tom in the very center of the Kuzbass. They want to accumulate floodwaters and then dilute the harmful admixtures of Keremovo's industries with a large amount of water from the reservoir. To jointly build a hydroelectric plant on this site. However, there is already a prepared and once again thickly grown over reservoir's river bed (27 villages and a multitude of hectares of beautiful flood plain land died during construction!). With this quantity of drainage polluting the Tom, the "Krapivinskiy Sea" simply must become nothing other than a gigantic collection of dangerous sewage. And they are going to "dilute" them? This problem has a large number of arguments against the dam and only one "for": the Tom which has become shallow will obtain a reserve supply of water. What kind, for whom and for what—is clearest of all. They are preparing this water for a new round of "industrialization" and for the most primitive, unreliable, and obsolete level. And for the most dubious achievements of our wretched scientific-technical progress.

For example, for the advertised coal pipeline for the entire country. Yes, the idea of uninterrupted transportation and delivery of coal for hundreds and thousands of kilometers along a pipeline is extremely tempting. But it has been realized in such a way that the coal pipeline, which has undergone several tests and has poured coal suspension on the ground which contains a plasticizer that is harmful to health, is doomed to failure. And here is the "Krapivinskiy

Sea"? The fact is that the coal can only be transported in a mixture with water. That is, take the last drops from the dehydrated Kuzbass and drive them to other places, all of this will reach a dead end. But you cannot even take these drops anywhere. And here a hydrosystem could be of service.

Oblast residents long ago recognized all of this, even during the 1989 strike. The miners insisted on stopping the next "turn of the river." Only conservation work is allegedly going on at the hydrosystem. But then why do energy industry builders continue to place emphasis on an electrical transmission line from Krapivinskiy GES [hydroelectric power plant]? It is as if the most ordinary continuation of construction is occurring.

But several words about the guests and journalists among whom were Americans Frederick Kempe (WALL STREET JOURNAL) and James Dorsey (READERS DIGEST), and Dutchmen Herard Jakobs, Paul Babeliovski, and Theo Witenboggard [all names as transliterated]. They made coverage of the industrial region's ecological problems their primary task. However, journalists are journalists and they have a large number of other themes, all the more so since the majority of them were in our country for the first time. For example, they visited Kemerovo UKGB [Committee for State Security Administration] and they turned out to be the first foreign visitors at this administration.

Long conversations with the leaders of Oblkemerovougol Lease Association—A. Zaytsev, Polosukhinskiy Mine which is entering a Soviet-British joint venture—I. Gladun, Mezhdurechensk Gorsoviet Chairman—S. Shcherbakov, and M. Sitkhali, a farmer from Topkinskiy Rayon, made a profound impression on them. While we were driving from Anatoliy Pavlovich Zaytsev's office, perplexed, Fred Kempe told me: "But you have so many intelligent business people...." He did not continue to speak but the continuation was also understood: Why do you live so poorly?

Well, we will have to talk about that on the way to the Northern Arctic Ocean.

**U.S. Firm Discusses Perm Mine Waste Recycling**  
*PM0708140591 Moscow ROSSIYSKAYA GAZETA*  
*in Russian 7 Aug 91 p 1*

[Unattributed report: "Businessmen also Agree to Waste"]

[Text] A meeting has been held in Perm between leaders of the oblast soviet executive committee and representatives of the Pak-Rim-Katpro [name as transliterated] corporation (United States). In the Kama region the corporation is interested primarily by the Kizelovskiy coal basin. A detailed business plan has been submitted for the oblast soviet executive committee's examination. It suggests creating a network of enterprises to extract a whole range of chemical compounds from the mine dump areas and acid mine water at present poisoning the rivers.



### Krasnoyarsk Experiencing Mercury Contamination Scares

91WN0615B Moscow *LESNAYA GAZETA* in Russian  
16 Jul 91 p 1

[Article by *LESNAYA GAZETA* Correspondent P. Dubynin, Krasnoyarsk: "Mercury Alarm"]

[Text] Panic has hardly ever broken out in Krasnoyarsk. The local radio station interrupted its broadcast several times in a row to report that bread "with possible mercury contamination in it" had arrived at Sverdlovsk Rayon stores. Civil defense headquarters urgently requested that the purchased product be returned and those who consumed the product should report to the nearest out-patient clinic for a medical examination.

Competent organs are now involved with the emergency situation. They will comment only after they have conducted a painstaking investigation.

We need to add to what has been said that there have literally been two mercury alarms in Sverdlovsk Rayon where primarily woodworkers and furniture makers live. First of all, two broken 250-gram "bulbs" filled with the liquid metal were discovered on the pedestrian stair crossing. Later an entire tank with 50 kilograms of the dangerous substance was "found" on the grounds of the kindergarten that belongs to the DOK [woodworking combine].

Well, there have already been nearly 10 such incidents since the beginning of the year. What can you do: mercury is being found in Krasnoyarsk and everything's here! [rtut i vse tut!—a play on words].

### Pulp, Paper Combines Polluting Severnaya Dvina River

PM1608133791 Moscow Russian Television Network  
in Russian 1700 GMT 10 Aug 91

[From the "Vesti" newscast: Report from Arkhangelsk by V. Loyter and Yu. Skalin, identified by caption]

[Text] [Loyter] Here it is, the beautiful Severnaya Dvina—the only river in Russia not partitioned off with dams and not engineered to form artificial seas. Over the last 50 years the five pulp and paper combines on its bank have managed to poison the once spring-clear water with their waste products and output. According to figures dating back three years, within the city limits alone 295 million tons of effluent are discharged into the river, 90 million tons of which are untreated. According to the results of laboratory study, the number of intestinal bacilli in the river exceeds the permissible norms 24,000 times. Therefore it is not surprising that the river is becoming overgrown and its banks are turning into a swamp. The catastrophic shallowing of the Severnaya Dvina follows in the wake of the foolish tree felling along the banks of the river. Splendid diesel ships are laid up in the moorings at Arkhangelsk's river port, unable to make regular trips from Arkhangelsk to Kotlas.

### White Sea Chemical Munitions Burial Sites Revealed

91WN0595C Moscow *KOMSOMOLSKAYA PRAVDA*  
in Russian 20 Jun 91 p 4

[Article by K. Belyaninov: "You Can't Hide Something by Sewing It Up in a Bag. And That's a Good Thing!: The White Sea: The Answer Lies on the Bottom"]

[Text] Despite the assurances from many of our military leaders that there is nothing but starfish and mussels on the bottom of the White Sea, we can definitely assert that if it is not strewn with containers filled with old chemical weapons, then there is excessively much buried there. At least as much as in the Barents, Kars, and other northern seas which at one time caught the eye of our native strategists.

Even now *KOMSOMOLSKAYA PRAVDA* has at its disposal testimony proving that there are not just two chemical munition burial sites in the White Sea, as noted on all navigational charts without exception, but many more.

Here is what we have managed to ascertain with the help of our readers.

1. From February through May of 1956 transport columns loaded with chemical munitions traveled continuously from Arkhangelsk Oblast's Obozerskaya Station to Severodvinsk. In Severodvinsk these munitions were loaded onto ships and then sunk in the White Sea. The entire trip took scarcely more than 48 hours. A year later the remnants of the munitions from the Obozerskaya Station were buried in the region of Spitzbergen Island. These transport columns were accompanied to Severodvinsk by military guard details from an artillery regiment which was subsequently disbanded. Our editors have the testimony from persons who accompanied the cargo, as well as the numbers of the military units [chasti], and the names of the ships which hauled these weapons.

2. During the years 1960-1961 chemical munitions were shipped to Pechenga not only from the Leonidovka Station in the Volga region (see *KOMSOMOLSKAYA PRAVDA* for 13 June 1991), but also from storage facilities located in Saratov Oblast. Trains loaded with these weapons were accompanied by cadets from the Saratov Chemical Warfare Training School. Among other things in the transport columns there were aerial bombs weighing 100, 250, and 500 kilograms; they had been produced during the years 1938-1939 and were charged with sarin [a nerve gas], yperite [mustard gas], and lysite. In Pechenga these munitions were loaded onto ships of the Murmansk Merchant Shipping Company which had been leased by the Ministry of Defense, after which these weapons were sunk in the region of Novaya Zemlya. A total of 183 units of chemical munitions were shipped out of Pechenga.

This is only part of the information which the editors now have at their disposal, and all this data needs to be verified. But the data communicated by our readers is really too detailed—right down to the names of the ships and the

numbers of the military units—and too coincidental for it not to be trusted. And, by the way, almost half of these readers, professional seamen who have served for more than a decade in the Soviet Far North, assert that the currents in the Northern seas are such that the munitions sunk near Novaya Zemlya certainly had to have run onto the southern shore of the Dvina Inlet—the site where the starfish perished. It remains to be explained where the remainder “went.”

Therefore, the “Club of the Inquiring” requests response from those persons who have at their disposal the precise coordinates of the sites where these chemical munitions were submerged. We appeal for help to those scientific institutions and public organizations who are ready to render assistance in preparing a new expedition to the White Sea.

### **Sakhalin War Games Prompt Local Fisheries Protests**

*PM1408153291 Moscow MOSCOW NEWS in English No 30, 28 Jul-4 Aug 91 p 2*

[Stanislav Glukhov report: “Bullets in the Caviar”]

[Text] On Aniva Gulf of Sakhalin island gunships launch missiles, artillery and tanks open fire. It is the rehearsal for traditional July war games. Bleachers for guests have been built on the coast, high-ranking officials from the capital are expected and, centrally, a military delegation from the People's Republic of China is due to arrive. The military unit has been conducting its annual exercises and shooting practices precisely in this area for about 20 years. But today voices of the public, local authorities and the press are being raised, demanding that the July war games be banned.

The point is that “quite unexpectedly” the date of the shooting practices, fixed by the General Staff, are at the very peak of salmon season as well as crab-spawning time. In response to my question about the coincidence, Lieutenant-Colonel Mikhail Orlov from Combat Training Administration of the Far Eastern Military District, gave a disarming sigh.

“We have nothing to do with all this. The date is fixed by the General Staff”.

“I must teach the soldiers to fight against the enemy landing force,” commander of the unit Fedor Makavchuk stated firmly.

“I am fulfilling an order, and I am not going to ask permission of the district Executive Committee.”

“The military simply presented us with a ‘fait accompli’ announcing the start of the war games,” Nikolay Lukyanov, Chairman of the Aniva District Soviet of People's Deputies, explained.

But the salmon do not want to obey the General Staff and postpone the spawning period. So, the Presidium of the District Soviet tried to deny the order and reschedule the shooting time, and sent telegrams to the Supreme Soviet of

the Russian Federation and the Republican Council of Ministers. But all was in vain. As Andrey Toschchenko, Chairman of the district Environmental Protection Committee, put it, as a result of this past April's shooting exercises the military was sued 2.7 million roubles for ecological damage (apparently the first such suit in the history of the region). After the April shootings, in which the fishermen sustained heavy losses, dead crabs and other sea animals were being cast ashore for quite some time.

The situation could be easily remedied by merely postponing the actual shooting. The army could remain in combat readiness and the fishermen could catch their fish quietly. Fishermen, ecologists and the Chairman of District Soviet Nikolay Lukyanov are inquiring about this option now. Incidentally, the Chairman himself was commander of the unit a year ago and understands the task at hand better than anyone else.

Maybe Moscow knows nothing about these surprising coincidences. But I couldn't believe that if I tried: both Marshal Yazov and Moiseyev, Chief of General Staff, have come to the capital from the Far East and know what red fish and caviar are. Or do they think they only come in cans?

### **Green Parties' Conference Views State Sovereignty, Nuclear-Free Zone**

*91P50269A Kiev MOLOD UKRAYINY in Ukrainian 6 Jul 91 p 1*

[Article by Dmytro Yaremchuk: “Sovereignty and Ecology”]

[Text] On 3-4 July in Kiev a political-consultative conference of the politicized eco-movements of the Baltic and Caucasian republics, as well as other states of the USSR was held at the initiative of the Ukrainian Green Party. The theme of the conference was: “State Sovereignty From the Green Point of View.”

A press conference of the participants took place on the concluding day at the headquarters of the Green World Association.

At the conference many party representatives gave presentations from their programs and propositions, especially from Estonia, Lithuania, Georgia, Armenia, the Ukraine and others. The basic questions raised by its participants had three aspects: the problems of a nuclear-free zone, state sovereignty and European cooperation. Agreement was reached to create a consultative council, to which experts responsible for local directions of activity would belong. The Kiev organization of the Ukrainian Green Party, along with representatives of other parties, made a resolute protest on the occasion of the use of weapons by the Yugoslav Army against the peaceful, freedom-loving people of the independent Slovene Republic and supported its drive for freedom. One must say that recently the Slovene Greens initiated and organized the sending of 200 children from radiation contaminated rayons, especially Kiev and Ovruch, to Slovenia to rest. These children just returned during the fighting.

As it became evident during the process of contact, the structure of the parties is practically identical. Despite their regional interests, they gathered in Eastern Europe through a commonality of political actions in defense of the independence of their states. The participants exchanged experience and new interesting ideas. From the words of many of them, this conference is the start of close cooperation and a new stage in the development of the Greens in Europe. And if they believe that state sovereignty, the independence of a nation, its culture and language, and human rights are also ecological categories like land, air and water, then people can rely on them.

### **New Ukrainian Environmental Protection Ministry Established**

*91WN0638A Kiev KOMSOMOLSKOYE ZNAMYA in Russian 24 Jul 91 p 3*

[Article by Valentin Smaga: "Ministry for Survival?"]

[Text] Kiev—A commission of the Ukrainian SSR Supreme Soviet approved the functions and organizational structure of the new Ministry for the Protection of the Environment of the Republic.

There is trouble in our common home, in our native land. The Ukraine has been identified as an ecological disaster zone. For the time being, concerns about our daily bread have overshadowed what should be the main problem today in the public consciousness: The necessity simply to survive in a so-called environment that is inimical to human health. The concern about our daily bread grew even stronger after the "original" idea of Valentin Pavlov, the country's Prime Minister. This idea was to force the population to pay for the disorder brought about by a bankrupt system through a number of step increases in prices.

Judging from the first communication from the press center of the republic's new environmental protection ministry, chances of implementing one of the main points of the Declaration of State Sovereignty of the Ukraine, namely, the right of people to ecological safety, have greatly increased. The new minister, Yuriy Shcherbak, took the bull by its horns immediately, as they say.

In the former Ukrainian SSR State Committee for Ecology, on which the new ministry is based, the resource principle for the protection of nature, a principle that was very useful to various departments, is being eliminated immediately. In its place will be subsections which will be involved in strategic uses of nature. But first and foremost, they will develop ecological programs for saving the land of the Ukraine.

The new ministry will have its own scientific research facility. The state environmental protection service will at last monitor the environment with the help of modern electronic instruments and will create an effective and expert service for evaluating new projects and technology. Its legal organization will actively participate in developing an entire package of laws directed at protecting the total environmental complex of the Ukraine.

A framework already exists for this truly titanic work. Legislative acts on local self-government and on transferring Union enterprises to Ukrainian jurisdiction give all of us the opportunity, more than ever before, to feel that we are masters of our own house, and to provide an opportunity to the new ministry to develop its own capability for inspecting oblasts and districts.

The Ministry has publicly declared that it will observe full openness and credibility of information about the status of the environment. Its plans include the organization of its own publishing unit and the publication of an ecological newspaper.

Our lives are now so complex that good news are especially valued. If the intentions of the new ministry materialize into actions, we shall then live in a country where the sacred right of a person to have fresh air, clean water, and unpolluted earth will be guaranteed much more effectively than at present.

Let us wish many successes to the new ministry!

### **Continuing Environmental Degradation in Aral Sea Area Outlined**

*91WN0648A Moscow MOSCOW NEWS in English No 16, 21-28 Apr 91 p 4*

[Article by Grigory Reznichenko: "The Aral: A Phantom Sea"]

[Text] The level of the Aral Sea has dropped, compared with last year, by almost a meter. There are actually two seas: the large Aral and the small one. The two seas contain just a little over 400 cubic km of water.

Recent research data confirm that the degradation of the environment in the areas adjoining the Aral Sea, with a population of several million, is now on a huge scale. Out of a hundred inhabitants of the Karakalpak Autonomous Republic 70 are incurably ill with hepatitis, ulcer, typhus or cancer. Ninety to 118 babies out of every thousand die before they are one year old. More and more babies are born with deformities.

Tens of thousands of people in the area are unemployed. There are permanent shortages of food and drinking water. There isn't enough housing and medicines. Despite lavish resources of raw materials, local industry is underdeveloped. Agriculture oriented exclusively on growing cotton and rice is in desperate straits.

Over the past six years there have been as many as four government decisions supposed to improve the situation. The last one was headed: "On the implementation of the USSR Supreme Soviet's resolution: 'On Urgent Measures To Rectify the Country's Environment Concerning the Problems of the Aral Sea.'" But even this doesn't seem to be bringing any dramatic changes. Arable lands are exhausted and irrigation systems out of order. With up to 40 percent of the humus layer lost, the land can be made productive if it's given twice or even thrice as much water, plus fertilizers and chemicals. But this kind of technology will ruin

the land, and thus agriculture, altogether. Nothing new is offered in the government's resolution.

Nor does it offer any ideas about how to save the sea and the people living nearby. Of course there are plans to salvage the sea, bit by bit. But to restore the sea's former level about 700 cubic km of water are needed. This will require 50 years at best and 140 at worst. Meanwhile the sea continues to be polluted—20-22 cubic km of pesticide-polluted water are discarded in rivers flowing into the Aral Sea and there are no signs that the situation will change. That means that seven out of ten people will continue to drink polluted water.

### **Uzbek, Tajik Presidents Propose Return to Siberian River Diversion**

*91WN0648B Moscow MOSCOW NEWS in English  
No 19, 12-19 May 91 p 4*

[Article by Ak-Mukhammed Velsapar: "Short-Sighted Politicians Jeopardize Rivers"]

[Text] On 21 April 1991, in the Turkmenian capital of Ashkhabad, President I.A. Karimov of Uzbekistan and President S.A. Niyazov of Turkmenistan signed a treaty of Friendship and Cooperation between the two neighbouring republics.

The press conference was held upon the conclusion of the Treaty. "Our Republic is sick and tired of living the life of a beggar," Uzbekistan's President Karimov said, "and we are no longer going to beg for anything from the Centre. We're going to fix our own market prices on all raw materials taken out of the Republic. And the prices will match those of the world market."

The sore Aral Sea problem was raised at the press conference. And here the audience heard a proposal that called for a return to the project which would divert part of the flow of Siberian rivers to Central Asia. The water, they were told, will return to Russia in the form of cotton, vegetables, and so on. For this to materialize, there is a need to curb the "sharp-witted writers" who speak before the country's Supreme Soviet against the given project. May these writers come to Central Asia in August to get a sense of what life is like here in summer without water. They must see firsthand the needs of a region whose present population of about 32 million will double by 2005. The "sharp-witted writers" have suggested we more conservatively use our water. This will require investments running to at least 21 billion roubles. But with that much money we could divert part of some Siberian rivers to Central Asia. The audience responded to these utterances with tumultuous applause.

I can't accept such a idea.

It's taking us increasingly greater pains to depart from Great Power mentality. And this vice is widespread not only within the Kremlin. I venture to remind our two presidents of a Turkmenian proverb: "Guard whatever little you possess, and this will keep you from coveting other's possessions..."

There is plenty of water in Siberia, of course. But we'd do better to invest our money in drip irrigation and in giving a concrete base to all of our irrigating ditches and water conduits. It's worth considering that our Central Asian Republics switch to less moisture-absorbing crops—grapes, figs, persimmons, olives, apricots, peaches... And it's time, at last, to stop increasing cultivation of cotton which robs us of so much of our water. After all, except for the few mountain streams at the foothills of the Kopet-Dag there's practically no clean fresh water left in Turkmenistan.

There are no royal privileges in ecology. And therefore even presidents shouldn't arrogantly meddle in God's affairs and try to repattern continents according to their liking. May the Earth remain what it was when it gave birth to all of us, uncrippled by various development and construction projects, may presidents resign themselves to the fact that they won't have any Siberian water if they don't learn to conserve their own. In this way they won't have to keep thinking about harming the Yenisei.

During the press conference, I became reconvinced that the newly-baked presidents of Central Asia lack constructive opposition. Without the latter it will be hard for them to properly handle their suddenly acquired omnipotence.

### **New Environmental Weekly Published in Uzbekistan**

*LD0808111591 Tashkent SOVET OZBEKISTONI  
in Uzbek 25 Jul 91 p 2*

[Summary] The Uzbek SSR State Press Committee is to begin the publication, in August, of a new weekly called UZBEKISTAN TABIAT-i [UZBEKISTAN ENVIRONMENT] which will be published on a monthly basis only until the end of this year, then from 1992 it will be published on a weekly basis. Initially, 20,000 copies are to be published at a cost of 20 kopecks a copy. The weekly will cover questions related to the environment, its protection, and the prevention of pollution.

### **Kazakhstan's Ust-Kamenogorsk Seen as Ecological Disaster Zone**

*LD0808175691 Alma-Ata KAZAKHSTANSKAYA  
PRAVDA in Russian 17 Jul 91 p 3*

[Excerpts] A USSR Supreme Soviet permanent expert commission on ecology has been working for eight months in Ust-Kamenogorsk. The commission came here in connection with a major accident at the beryllium line of the Ulba Metallurgical Works. [passage omitted]

"Believe me, we're really not exaggerating," journalists were told at a news conference by Professor A.G. Nazarov, a doctor of biology and chairman of the USSR Supreme Soviet permanent expert commission. "Our group made an independent assessment of the consequences of the Chernobyl accident. It is difficult to surprise us with anything, but the results obtained in Ust-Kamenogorsk are discouraging. As a result of comprehensive scientific and practical research, we came to the conclusion that Ust-Kamenogorsk today is one of the most ecologically unfavorable cities in the world.

"One-third of the city population, or 170,000 people, are drinking water poisoned with heavy metals. Already today a number of water intakes have had to be closed. In certain districts of the city drinking water needs to be transported. Atmospheric emissions have exceeded the reasonable limit. Today, up to one ton of harmful substances are encountered by every resident—including babies and infirm elderly people—each year. Over the decades in East Kazakhstan there has been a three-fold increase in mortality, in all age groups. There has been a drop in the birth rate. Medical-biological research of recruits in Ust-Kamenogorsk has shown a high blood content of chromium, boron, arsenic and lead. One in four young residents of the city suffers from anemia.

"The technogenetic load on the city is simply monstrous. Industrial effluent alone amounts to 150 million cubic meters a year. Complex organic compounds have been found in the city's atmosphere. Their effect on the human organism has simply not been studied. The commission was also alarmed by the following circumstance. In a number of rivers—Ulba, Glubochanka, (Krasnoyarka) — mutant gene centers have been discovered, ie geographical ranges of the spread of mutating plankton. All this allows us to declare a catastrophe whose consequences are difficult to forecast".

Without any doubt, concluded Professor A.Nazarov, it is time to declare Ust-Kamenogorsk an ecological disaster zone. [passage omitted]

## REGIONAL AFFAIRS

### Inter-European Declaration on Cooperation in Nuclear Security, Waste

*91AN0372A Brussels EUROPE in English 28 Mar 91  
p 16*

[Article: "Nuclear: Germany, Belgium, United Kingdom and France Sign a Common Declaration on Closer Cooperation"]

[Text] Paris (Agence Europe)—The French, British, German and Belgian governments signed on Monday a common declaration to cooperate more closely in the field of civil nuclear [applications], especially in the field of security and wastes, said the French Minister of Industry. Other European countries are invited to rally round the declaration, aimed at defining a consensus on energy policy in Europe and on the role given to the nuclear in this policy.

The four countries agreed on the necessity to demand a high level of nuclear security. They intend to strengthen cooperation between their countries at all levels and intensify exchange of information on the functioning of the installations.

Concerning the storage of radioactive waste, the four countries commit themselves to setting up the best achievable technologies with the highest possible safety levels and environment protection. They announced the strengthening of cooperation between the bodies charged with waste management in the different countries.

Finally, the four countries hope to help the countries of Central and Eastern Europe bring their nuclear industries to a level of security comparable to that of the European Community.

### Italy Hosts Conference on Earth Observation Satellites

*91MI0334X Rome SPAZIO INFORMAZIONI  
in Italian 24 Apr 91 pp 2-4*

[Text] Sophisticated remote sensing space technologies are being used increasingly to solve environmental problems and also account for an interesting market niche. This is probably the reason why all the major Italian and European companies presented their environmental monitoring projects at the recent international symposium in Venice on: "The Earth's Environment, An Assessment from Space." On the one hand, therefore, experts and scientists are busy trying to understand the mysterious mechanisms of nature and the weather and to identify the changes brought about by man's presence, and on the other, specialized companies are ready to demonstrate the ability of sensors, satellites, and orbiting platforms to collect large amounts of data on the state of our planet.

The primary goal of the Venice symposium—which was held at the Fondazione Cini by the European Association for International Space Year (EURISY)—was therefore to create a forum where "science" and "technology" could

meet and exchange views in order to face environmental problems in an informed manner and with highly sophisticated tools. Remote sensing via satellite can already play a very important role in this area since it has become the object of a large number of initiatives in Europe. The ESA (European Space Agency), for example, after successfully extending the range of Meteostat meteorological satellites, is now working on new projects that were presented in Venice by Professor Philip Goldsmith, director of the ESA's Earth Observation Program. The ERS-1 (European Remote Sensing Satellite) for ocean studies will be launched into orbit early in May and will be followed in 1994 by the ERS-2, equipped with special equipment to assess the amount of ozone in the atmosphere. In 1997, ARISTOTELES (Applications and Research Involving Space Techniques for the Observation of the Earth's Field from the Low-Earth-Orbit Spacecraft) is scheduled to be launched for the observation of the Earth's gravitational and magnetic fields, while in 1997-98 the POEM-1 (Polar Orbit Earth Observation Mission) will be placed on the Columbus Polar Platform for meteorological, climate, and ocean studies. In his speech, Prof. Goldsmith stated: "The ESA intends to provide the data that is required to understand environmental problems and related phenomena and to enable governments to decide which measures to adopt." In addition to the ESA, other European countries such as France with Glosat and Germany with Atmos, are currently working at projects on new earth observation satellites for environmental remote sensing.

### Italy's Ecosat Satellite

Italy, too, is becoming active in this sector. The EURISY symposium provided Alenia Spazio with an opportunity to present its Ecosat project for the first time. The project involves constructing a satellite to study and protect the environment, and to identify and assess the environmental impact of human activities mainly in the Mediterranean basin, northern Europe, and around the Equator. Professor Ernesto Vallerani, Alenia Spazio president, stated in Venice: "Ecosat is a preliminary attempt to combine consolidated corporate expertise to develop a satellite that will observe certain phenomena and allow experts to understand environmental changes." This satellite, deriving from the technological know-how acquired by the former Aeritalia company, should be carried into orbit in early 1996 by an Ariane-4 launcher. It will be equipped with two sensors: an X-SAR (synthetic aperture radar), and a MIOS (multispectral imaging optical sensor) that operates in the visible and infrared light spectra. With an estimated overall weight of 1,670 kg (780 kg of which are the payload), Ecosat could be built using a modified "body" of the SAX (X-Ray Astronomy Satellite) Italian-Netherlands scientific satellite, and operate at a height of 600 km in a polar, heliosynchronous orbit. Prof. Vallerani pointed out: "Ecosat was conceived to complement its French and German counterparts and, therefore, its configuration is not definitive." Prof. Luciano Guerriero, president of the ASI (Italian Space Agency) added: "We have already suggested coordinating these three initiatives to make them complementary and provide a complete

picture for the future European polar platform." ASI is currently exploring the possibility of continuing a bilateral study with France's CNES (National Center for Space Studies) for the development of a new infrared interferometer (called IASI), whose preliminary configuration has already been defined by the Officine Galileo. Similarly, 60 billion lire in funding have been confirmed for the 1990-94 National Space Plan update—which, however, has not yet been officially submitted to the CIPE [Interministerial Committee for Economic Planning]—earmarked for a small earth observation satellite. An upgraded Scout launcher should launch this mini-satellite from the San Marco launch site in Kenya in the next few years.

Giuseppe Grande, Fiat Spazio president, illustrated this project in Venice. Two models have been defined: Scout 2, with two BPD solid propellant boosters, capable of launching, at a height of 550 km, a 500 kg payload into an equatorial orbit and a 350 kg payload into a polar orbit, and Scout 4, with four boosters, capable of launching an 800 kg payload into an equatorial orbit and 600 kg payload into a polar orbit. In his speech, Grande stated: "Fiat Spazio has combined several Fiat group companies and has reached a series of agreements with national and international companies. We are, therefore, now in a position to offer clients a complete service that includes: mission analysis, system study, design, development, satellite acquisition and integration, launch, orbit control and data collection services." However, when asked by SPAZIO INFORMAZIONI about the development stage of the new launcher (also called San Marco Scout by the ASI), Grande revealed that: "We are still waiting for ASI's response to a proposal for the second study stage which we submitted quite a while ago. No renewal contract has yet been signed."

#### The Spot Environmental Satellite

Italy, too, seems to be developing a greater awareness of the importance of space remote sensing techniques in environmental monitoring. During the EURISY symposium, Telespazio, an IRI-STET [Institute for the Reconstruction of Industry - Turin Telephone Finance Company] group company announced it had secured a contract from the Ministry of the Environment for the use of images taken by the French Spot satellite. The managing director of Telespazio, Raffaele Miniucci maintained: "A method that uses Spot's panchromatic data has been developed to classify 8,000 km of national coastline into different categories using the main indicators for pollutants discharged into the sea. Spot images were used to obtain an updated description of land coverage and use with special reference to urban, industrial, and agricultural areas and ports, which are the main sources of pollution along the coasts.

#### European Space Agency Center for Remote Sensing Satellite Data Opened

91MI0335X Rome SPAZIO INFORMAZIONI  
in Italian 24 Apr 91 pp 4-6

[Text] At the recent inauguration of the EECF (Earthnet ERS [Environmental Remote Sensing Satellite] Central

Facilities) at ESRIN [European Space Research Institute] in Frascati (Rome), Dr. Jean-Marie Luton, ESA (European Space Agency) director general stated: "ESRIN will guide and lead European earth observation strategies over the next 20-30 years." Many experts in the field were present at the ceremony including Senator Learco Saporito, under secretary of universities and scientific research; ESRIN director, Francis Roscian; ESA council president, Professor Francesco Carassa; ASI (Italian Space Agency) president and director general, Professors Luciano Guerriero and Carlo Buongiorno; the director of the San Marco project, Professor Luigi Broglio; head of the Space Division of the Ministry of Universities, Engineer Francesco Mazzuca; ASI scientific committee president, Professor Remo Ruffini, and Alenia Spazio president and managing director, Professor Ernesto Vallerani and Dr. Andrea Pucci.

#### EECF Activities

The EECF is expected to ensure the best and most comprehensive use of data collected by the new ERS-1 [European Remote Sensing Satellite] (to be launched by an Ariane-4 launcher from the Kourou launch site in French Guyana between 3 and 4 May), to meet the diversified needs of users. ESRIN has developed sophisticated computer equipment to ensure uninterrupted connections both with ESOC (European Space Operations Center) in Darmstadt, Germany, which programs the operations of the missions prepared by the EECF, with the earth stations to program the quasi-real-time distribution of the data, with the EDP centers for the output ordered by users, and with the users themselves to give them direct access to the catalogue of worldwide ERS-1 data and message exchanges.

#### Speeches by Saporito and Luton

In his speech, under secretary Saporito stated: "The most important aspect here is probably Italy's determination to make this ESRIN center, which is the ESA's point of contact with users and the epicenter for the future of our environment, play the role it deserves. This cannot but encourage the Italian government to take on international commitments at the ESA's next ministerial conference. Italy intends to honor its commitments in this direction so that the logistic infrastructures and the necessary additional space can be made available to ESRIN as soon as possible." In the subsequent press conference Senator Saporito pointed out that an ad hoc commission has been set up "to improve ESRIN's development prospects" and that, following a study carried out by the ASI to resolve the center's logistic problems, the Ministry of Universities is about to officially assign the task to the ASI "with the possible advancement of funds."

Luton in turn said: "We can already affirm that ESRIN's future in the years to come will be closely related to social and political activities. We will follow this development with great expectations. We will use all the support that the Italian authorities can provide to achieve our goals at

ESRIN. In fact, constraints are already being felt in terms of infrastructures and space for personnel."

#### The ESA's Problems

The presence of Dr. Luton at the press conference with Senator Saporito provided an opportunity to deal with the organizational and financial problems that could become an obstacle to future activities. Senator Saporito stated: "We are concerned because European countries are going through difficult economic times. Therefore, two ministerial meetings will probably have to be called to assess the current situation and identify future objectives. We are dubious and dissatisfied because the Italian effort has not provided sufficient spin-offs to justify our expenditures to parliament." When asked by SPAZIO INFORMAZIONI to comment on these statements and provide some information on the proposal to update the ESA's long-term plan, Luton replied: "Italy's returns in terms of financial and human resources correspond to its investment. The effects, however, will only be felt after a few years. Only in the last five years did Italy increase its financial contribution and therefore the returns are not entirely satisfactory as yet. This will come slowly because trends cannot be reversed in a few months or years. There are sectors in which there is room for improvement, but please do not ask me to return in two months and show them to you."

Dr. Luton then went on to address the issue of updating the long-term plan, which should be approved at the ESA's next ministerial conference scheduled for next fall (October?) in Germany perhaps. He emphasized that he was aware that, "financial problems do exist and all the decisions taken at the Hague conference in 1987 cannot be implemented. At a recent informal meeting held in Santa Margherita Ligure, the board proposed revising the plan with a 10 percent reduction in funding between 1987 and the year 2000 that will still allow us to honor earlier commitments. I am reasonably confident," he concluded, "that our general goals can be achieved."

#### European Businesses Surveyed on Environmental Policies

91AN0473X Groot-Bijgaarden DE STANDAARD  
in Dutch 21 Jun 91 p 21

[Article: "Half of Europe's Large Companies Have an Environmental Policy"]

[Text] Brussels—More than 80 percent of European businesses think that the demand for environmentally friendly products is growing, but only 55 percent of the largest companies have a formal or written environmental policy.

This was revealed by a survey undertaken by DRT. A questionnaire was sent to 250 major West and East European businesses in 15 sectors. Sweden showed itself to be the cleanest; all the concerns questioned stated that they had an official environmental policy, while in Turkey only 18 percent of the companies had one. More than half of the companies in Belgium, Denmark, the Netherlands, Norway, Italy, and Great Britain said that they had an environmental policy.

Of those questioned, more than 80 percent thought that the demand for "green" products is increasing, but only 45 percent have made changes in their production line. Ten percent felt that their company had lost business because consumers have turned away from products which are dangerous for the environment.

## DENMARK

### Ban on Use of Freon Gases Set for 1995

#### Schedule Cut by Environment Minister

91WN0586A Copenhagen BERLINGSKE TIDENDE  
in Danish 20 Jun 91 p 1

[Article by Bodil Jessen: "Ready for Speedy Freon Ban"]

[Text] The Environment Ministry is ready for a total ban on the use of freon gases four years ahead of schedule. The Industrial Council wants more exemptions from the ban in order to avoid shutting down production in a series of factories.

Denmark will ban the use of ozone-layer penetrating freon gases as of 1 January 1995. This is four years ahead of schedule, and two years before the other EFTA [European Free Trade Association] countries will be ready to ban the sale of the materials. Only Germany has a corresponding total ban.

Environment Minister Per Stig Moller (Conservative Party) has shortened the time because the Environment Ministry in cooperation with industry has found production methods in which environmentally dangerous materials can be avoided. Among other things, this has to do with the so-called CFC gases, which are used as means of freezing in the refrigerators and as means of cleaning in the electronics industry.

"We would like to have rapid environmental improvements and at the same time give Danish industry a head start over the other EFTA countries. We are doing this by giving them a shorter time period so that they can be ahead of their competitors with the use of substitutes for ozone-layer penetrating substances," Moller said.

Industry is having difficulty with the head start. "We cannot be satisfied with the announcement," Secretary of the Industrial Council Lars Blom said. He has sent the announcement to 15 affected firms for consideration.

"The companies have asked for a series of exemptions in areas where there are as yet no known substitute materials. Many of these requests have not been met, and this means that in four years we will risk a limitation of production in Denmark while this production will be able to continue abroad," Blom said.

The electronic firm Bruel & Kjaer uses freon today for cleaning print plates, but a total ban will not hurt the company economically or in production.

"I suppose we can find substitute materials," the company director, Per V. Bruel, said.



The announcement on freon gases has been discussed in industry and in environmental organizations. Now the Environment and Planning Committee of the Folketing together with the EFTA Commission must take a position on the environment tightening that is expected to take effect 1 January 1992.

It also includes trichlorethane, which is used in straightening liquid—the so-called “fool’s wax”—together with salts that are used to extinguish fires.

Today there is a ban on the use of freon in spray cans and in the production of foam rubber.

### Most Dangerous Gases Already Replaced by Industry

91WN0586B Copenhagen BERLINGSKE TIDENDE in Danish 21 June 91 II 3

[Article by Bodil Jesson: “Industry Already Reducing Freon”]

[Text] Freon consumption has fallen by up to 70 percent in one year, because industry has gone over to more environmentally correct products. The Danish experience in removing ozone damaging CFC gases will be sold abroad at a conference in the United States in December.

During the past two years, industry has replaced the most dangerous freon gases with more environmentally friendly products. Consumption of one of the most harmful freon gases, CFC-12, has fallen by 70 percent from the first quarter of 1990 to the same period this year, the Environment Administration reported. Many Danish industries have completely removed their part of the dangerous effect on the ozone-layer.

Environmental Minister Per Stig Moller (Conservative Party) said yesterday to BERLINGSKE TIDENDE that all use of the ozone-layer penetrating CFC gases will end 1 January 1995. This is four years ahead of schedule and two years before a general EFTA ban on the sale of the dangerous freon gases.

The Environment Administration has supported 30 projects for two years with a total of 20-25 million kroner in efforts to get industry to use environmentally friendly “soft” gases in production, according to Civil Engineer Henrik Petersen of the Environment Administration. Forty-five million kroner has been set aside for development work. “A fine example of cooperation between the public and private sectors,” in Moller’s opinion.

The results are at any rate very clear. In 1989 industry imported 4,000 tons of CFC gases. In 1990 the amount had fallen to just 2,000 tonnes.

One of the examples is the Tarco factory in Fredericia, which produces district heating pipes. Tarco has reduced the factory’s harmful effect on the ozone layer by 98 percent by introducing substitute materials for the CFC gases.

The Danish results in the removal of CFC gases will now be sold abroad.

“In December there will be a large international conference on CFC gases in Baltimore in the United States, where we will present four of the projects the Environment Administration has supported,” Per Henrik Petersen said.

The CFC gases are used particularly in the coal industry and in the heating industry, both of which are widespread in Denmark. We produce more than a million refrigerators a year, and Denmark provides half of the world’s production of heating pipes. In spite of the decline in the use of CFC, a series of factories will have problems in finding substitutes. Among other things, because a series of substitute materials are also banned in the new environment tightening.

“It is clear that some factories will have problems, but all serious factories are working on the development of substitutes for the dangerous freon gases,” Petersen said.

### Dangers of Freon Substitutes

91WN0586C Copenhagen BERLINGSKE TIDENDE in Danish 21 Jun 91 p 10

[Editorial: “Material for Survival”]

[Text] Denmark wants, together with Germany, to belong to the elite league in Europe, if Environment Minister Per Stig Moller gets what he wants. With a ban beginning 1995 on freon gases, which attack the earth’s ozone layer, the minister hopes to achieve two things: to benefit the environment and to benefit industry. A ban will force industry to speed up the development of substitute materials for freon and thereby give us a head start over foreign competitors,

Says the minister. But he isn’t sure. No one is sure. The fact of the matter is that there is no guarantee that the new materials that are to replace the dangerous CFC gases are not just as dangerous for the environment as the freon we now want to get rid of.

At a meeting in Geneva this week, where the global climate changes were discussed, the British physicist Joe Farman warned the chemical industry, which has spent billions to develop replacement materials for freon, against the new gases HCFC and HFC, which may be worse than the ozone-penetrating freon. And he is not just Mr. Nobody. It was Joe Farman, who in 1986 sounded the alarm after having found the hole in the ozone layer over the Antarctic.

Industry can live with a freon ban, even if it is not as optimistic as the environmental minister in the matter of developing usable replacement materials. And a freon ban can mean that in four years there will have to be a stop in a series of productions that will continue abroad, where there is less restriction. This may be the necessary price of an ambitious environment policy. But before the bill is prepared, it will be wise to make sure that there are less damaging alternatives and that other countries go along. For industry there are billions at stake. For the earth it is simply a matter of survival.

## FRANCE

### **Environmental, Industrial Hazards Institute Established**

*91AN0337A Paris FRENCH TECHNOLOGY SURVEY  
in English Feb-Mar 91 p 4*

[Article: "INERIS: a Major Industrial Environment Project"]

[Text] Unlike other countries, notably its European partners, France has no institute for research, analysis and measurement concerned with the environment and industrial hazards. The Government recently decided to establish such a body, hence the creation of INERIS (National Institute for the Environment and Industrial Hazards). This institute will be a public establishment with an industrial and commercial vocation, placed under the auspices of the French Delegate Ministry for the Environment. It will be formed essentially from the CERCHAR (French Coal Industry Research Centre) team which has acknowledged expertise in industrial safety.

The terms of reference of INERIS will be to develop, implement and coordinate design and research programmes aimed at improving the safety and quality of the industrial environment:

—By foreseeing the harmful effects of industry on its environment;

—By ensuring that proper importance is given to the safety and health of those in the industrial environment.

Its capabilities will cover all technological risks (explosion, fire, air, water and ground pollution, etc.) excluding nuclear hazards.

The institute will provide technical support to the public authorities and local communities:

—It will generate and implement R&D programs to warn of risks and protect the environment from the impact of industry;

—Within its areas of competence it will take part in the formulation of technical standards and regulations both national and international.

It will offer a design and consultancy service to companies. At their request it will embark on studies, tests, or inspections or provide the necessary training to help firms prevent and resolve the harmful impact their business has on the environment:

—At every stage: from identifying the hazard through to post-accident enquiries;

—In every type of impact: physical, chemical, toxic and economic;

—And in every way: the impact on man, fauna, flora and goods.

An essential part of the institute's task will be to organize partnerships with all specialist organizations both in France and abroad, in the framework of joint research programmes.

## GERMANY

### **Aerospace Institute Develops UV-Sensitive Biofilm**

*91MI0305X Bonn WISSENSCHAFT WIRTSCHAFT  
POLITIK in German 3 Apr 91 pp 6-7*

[Text] In order to simplify the series of measurements required to ascertain the connection between the ozone hole and UV radiation, the Biophysics Department at the German Aerospace Research Institute (DLR) has developed a new type of biofilm that offers many advantages:

- The measurement procedure and evaluation of the results could hardly be simpler;
- The film is cheap to produce, and
- The measurement apparatus fits into an ordinary briefcase.

Reduced ozone concentration leads to increased UVB radiation in sunlight. In turn, UVB radiation damages cells and triggers mutation, causing skin cancer, for example. For some time researchers have been trying to prove that there is a relationship between the reduction in the ozone layer and the amount of cell damage due to UVB radiation.

The biofilm functions rather like a photographic film. A commercially available substrate foil is coated with an emulsion containing spores of the *Bacillus subtilis* bacteria. These spores are UV light-sensitive, but can be stored very well in darkness.

Evaluating the spore damage caused by radiation is just like developing a film. After exposure for one year in the Antarctic, where the ozone hole is particularly large, the biofilm is placed in a growth medium. The spores germinate and create biomass, especially protein. When the growth phase is over, the protein formed can be revealed by staining. This results in heavily or lightly colored areas, according to the degree of UV radiation. Heavily colored areas are those that have created a large amount of protein, and were therefore exposed to weaker UV radiation, whereas lightly colored areas received a high dose of UVB.

Different light wavelengths affect biological systems with different degrees of intensity. For example, UVB radiation causes cell damage, UVA tans the skin, and long-wave, i.e., infrared, radiation imparts warmth. Failure of the bacteria in the emulsion to germinate must be attributed primarily to UVB radiation. However, in order to give complete certainty that the cell damage is caused exclusively by UVB radiation, the biofilm is also shielded by filters that absorb all other wavelengths.

The newly developed biofilm, patented by the DLR, represents a considerable improvement on previous processes, especially in the evaluation phase. Before, a large number of different types of spores had to be exposed to

UV radiation in an expensive apparatus for various periods of time. The spores were then placed in a nutrient medium to germinate. This produced thousands of bacteria colonies that had to be counted—a very difficult and time-consuming process.

### Ecological Reconstruction Program for Eastern Germany

91MI0406X *Wuerzburg UMWELTMAGAZIN*  
in German May 91 pp 140-141

[Text] "The current crisis in restructuring the economy in the new laender cannot be overcome with conventional economic instruments alone. What is really needed for a rapid economic upturn is an accelerated ecological clean-up." This is the view expressed by Federal Environment Minister Dr. Klaus Toepfer while presenting the "ecological reconstruction" campaign on 19 February this year.

The analysis of the state of the environment in the new laender that he commissioned last year, long before the two German states were unified, had already demonstrated that considerable environmental strain is caused by the perennially polluted sites. This applies primarily to the heavily industrialized south of the former GDR and for sites previously used by the former National People's Army and the Soviet Army. It was therefore necessary, said Minister Toepfer, to introduce immediate measures for 196 of the 12,250 perennially polluted sites identified to date and to investigate 248,000 hectares of suspicious military areas.

### Ecological Reconstruction Program

The infrastructure needed to clean up these polluted sites would be created shortly as part of the "ecological reconstruction" campaign. Priority would be given to implementing the following measures:

- A world exhibition on reclamation technology to be held in the area comprising Halle and Leipzig, with innovative technology for all sectors of reclamation. The intention is primarily to set up six soil treatment centers, each with a 250 million German mark [DM] budget;
- Five thermal installations to be built for treating contaminated soil, each costing DM200 million;
- A chemical weapons disposal center, which the Bonn Environment Ministry calculates will cost about DM200 million;

As industry in the new laender currently has access to no special waste disposal facilities and still has to dump it, as before, on domestic garbage deposits or in the countryside or waterways, 10 special dumps at an estimated cost of about DM1.5 million each, plus two or three underground dumps at DM12 to 18 million each, are planned under the "ecological reconstruction" campaign.

The Federal Environment Ministry estimates that DM2 billion of the DM5 billion expected to be raised by a new tax will be spent to finance polluted site reclamation in the

new laender. According to an agreement between the parties forming the Bonn government, this new tax will be levied on garbage.

What the reclamation of perennially polluted sites in the new laender will cost can be guessed from the figures established by the IFO Institute of Economic Research in Munich. In a study carried out on behalf of the North Rhine-Westphalia ministries of the environment and the economy on the funds required to solve the most urgent environmental problems in the new federal laender, it concluded that some DM10.6 billion would be needed just for the initial work of hazard assessment and reclamation of the estimated 48,000 perennially polluted sites and suspicious areas.

### Reclamation Target State Railways

The assessment of the perennially polluted site potential in the new laender has concentrated to date on the areas that arouse suspicion according to western German experience. However, a case reported by the Hamburg-based Technical Biological Applications company shows that the need for reclamation may well be much greater. The tanks of a diesel locomotive were damaged on State Railways land and some 2,500 liters of diesel oil were spilled onto the rails of a major trunk line. The material was not removed and taken to a waste dump because of the lengthy line closures that this would have entailed. So the State Railways and the environmental authorities concerned decided to have the contaminated area cleaned up on the spot.

For this purpose a detailed program of sampling and determining the extent of the contamination in terms of surface area and depth was undertaken. It was found that both the soil and substratum to a depth of two meters and the underlying groundwater had already been polluted by the spilled diesel oil. So the groundwater was included in the cleanup. In order to prevent the groundwater contamination from spreading, the Hamburg company sank two wells immediately after starting work, which are pumping out the polluted groundwater. The water is then cleaned in a three-stage installation and discharged into a nearby drainage channel.

The oil contamination in the railroad ballast is dissolved out with surface-active agents and treated with specially adapted bacteria.

It is expected to take six to eight months to reclaim this polluted site. The contamination has already been reduced by more than 50 percent in the first three months.

### Progress on Direct Nuclear Waste Disposal Reported

#### Site Safety Report Published

91MI0365A *Bonn TECHNOLOGIE-NACHRICHTEN*  
*MANAGEMENT-INFORMATIONEN* in German  
17 May 91 pp 4-5

[Text] Environment Minister Prof. Klaus Toepfer presented the results of a safety analysis carried out by the

Reactor Safety Corporation (GRS) on the Morsleben permanent radioactive waste store in the Bartensleben salt mine (in Saxony-Anhalt, north-west of the village of Morsleben) to the public on 8 March 1991. As in a previous interim evaluation dated December 1990, the GRS came to the conclusion that there are no acute hazards that render it necessary to cease operations.

Based on the recommendations of the International Atomic Energy Agency (IAEA), the following four techniques for sealing the waste off safely from the biosphere have been developed and applied for permanent radioactive waste storage:

- Liquid radioactive waste: Delivery in reusable primary containers and transfer, using compressed air, in an underground emptying station, to an intermediate store with two 25-m<sup>3</sup> tanks. From these tanks, the liquid waste is piped to the permanent storage cavity, where it is sprayed onto a previously laid 40 to 50-cm bed of brown coal filter ashes. The ash bed is saturated, and after it has set the next layer is added. This process creates a monolithic block that fills the cavity completely. (Process installed in November 1990).
- Solid radioactive waste in reusable primary containers and sealed radiation sources: Transport below ground with a crane system in the stretch above the storage cavity to a dumping device. The lower cover is removed and the solid radioactive waste is emptied out onto the dumping equipment. During the dumping process, the outer casing and the upper cover of the primary container close the dumping hole off. (Process for combustible waste not subjected to special conditioning installed in December 1990.)
- Solid radioactive waste in 200-liter drums: Transport below ground on trailers and removal to permanent storage site on forklifts.
- Sealed radiation sources and special waste: Sinking of sealed, heat-emitting Co-60 radiation sources in special five-liter containers (steel cylinders) in holes drilled in the floor of the permanent store. (Process installed in November 1990).

In accordance with the permit granted, the cavity in the Morsleben store is gradually being prepared for permanent radioactive waste storage. The first stage of construction comprises 300,000 m<sup>3</sup> of underworkings in the fourth level of the Bartensleben mine, about 75,000 m<sup>3</sup> of which have been opened up to date. This latter capacity is equivalent to a waste volume of about 30,000 m<sup>3</sup>. Between March 1987 and the end of 1990, a total of 14,300 m<sup>3</sup> of, primarily, low-radioactive waste and 6,892 sealed radiation sources were taken in. Total radioactivity stored to date is 654 T becquerels.

Against the background of the GRS safety analysis, the Federal Environment Minister has called on the Reactor Safety Commission (RSK) to issue a statement about the operation of the Morsleben permanent store. The statement is expected for May 1991. Although there is no risk that would absolutely necessitate closing down operations,

the Environment Minister has provisionally discontinued storage of radioactive waste, regardless of whether the order to discontinue storing radioactive waste issued on 20 February 1991 by Magdeburg District Court is upheld or not. Once the RSK's statement is available, a decision will have to be taken on whether permanent storage of radioactive waste should be suspended until the geotechnical concept has been presented.

The terms of the operating permit cover only radioactive waste from the territory making up the former GDR. The Federal Ministry of the Environment has appointed a panel of legal experts that is examining whether and how legally it could be used for the permanent storage of radioactive waste from the entire FRG. At the same time, the Standardization Bureau is examining which existing and future radioactive wastes in the previous federal laender are suited to the permanent storage conditions in Morsleben store and might potentially undergo permanent storage there.

#### Ceramic Binding Material Developed

91MI0365B Bonn *TECHNOLOGIE-NACHRICHTEN*  
*MANAGEMENT-INFORMATIONEN in German*  
17 May 91 p 13

[Text] The Karlsruhe Atomic Research Center (KfK) has developed a new aluminum silicate ceramic for the safe binding of alpha-radiating waste, especially containing plutonium, for permanent storage. This product's long-term stability has been proved in a time-accelerating experiment that took only a few months to generate the maximum radiation load that, in practice, only occurs after storage periods in the order of 100,000 years, a period of time sufficient to destroy most of even the long-lived alpha radiation emitters. This means that a stable, reliable permanent storage product is available for processing such waste, especially waste containing plutonium 239.

Alpha radiation emitters, such as plutonium or other transuranic elements, occur in varying concentrations in sewage sludge, intermediate-level liquids, or solid wastes during the reprocessing of burnt out fuel elements or the production of fuel elements containing plutonium. Because of the high potential biological risk and the long half-life of alpha radiation emitters, special requirements are made on ultimate storage products designed to contain these radioactive elements as regards their chemical and mechanical stability and their resistance to radiation. These are the very demands that are satisfied by the new ceramic products that complete the KfK's work on enclosing high-level waste in glass and intermediate-and low-level waste in cement.

The special advantages of ceramic products are their thermodynamic stability and their inertness to the chemical composition of the waste to be processed.

Processing for permanent storage involves mixing the suitably pretreated radioactive waste with the ceramic raw materials kaolin, bentonite, and corundum, then shaping it into cylindrical tablets. Sintering at about 1,300 °C produces a ceramic that is thermodynamically stable to

internal alpha radiation and leaching. The ceramic's resistance to internal alpha radiation has been proved by tests on samples doped with 18 percent by weight of the "time-acceleration nuclide" plutonium 238. As a result of its considerably higher alpha activity and shorter half-life, within a few months these samples received the same alpha dose that under normal conditions, i.e., with the considerably less active nuclear fuel plutonium 239 incorporated, would only be reached after 100,000 to 200,000 years' storage. In the experiment, one day is equivalent to 500 years' actual storage. Even after a total dose of about  $10^{10}$  Gray ( $10^{12}$  rad), no internal structural transformation, which can entail a considerable loss in quality, could be detected.

Furthermore, the same low leach rates were observed for the time-acceleration ceramics with alpha radiation emitters as for ceramics with genuine waste. These leach rates are so minute that the alpha radiation emitters in the leach medium is barely detectable, even with the latest measuring equipment. The saline leach that could be expected if water were to penetrate the ultimate storage mine was one of the leach media used. Leach rates of this order guarantee that, even in the event of this worst conceivable accident, the environment would be safe from radiation.

The process developed here for bonding radioactive waste for ultimate storage is also basically applicable to handling highly toxic special wastes. Here, too, long-term stability is vital, as the toxic nature of some chemical wastes, such as heavy metal waste, never diminishes, as, unlike radioactive elements, they do not break down.

The work was carried out over a period of about four years at the Karlsruhe Nuclear Research Center Institute of Nuclear Waste Disposal Technology under a European Community research contract with a budget of about 1.2 million German marks.

#### **Laser-Based Flue Gas Measurement System Developed**

91P60240X Frankfurt/Main FRANKFURTER  
ZEITUNG/BLICK DURCH DIE WIRTSCHAFT  
in German 29 Jul 91 p 10

[Text] Scientists of the Institute for Physical Chemistry of the University of Heidelberg have developed a laser-based measurement procedure which could be applied for the protection of the environment. The LISA technique is conceived for purifying flue gases. LISA stands for in-situ laser-based ammonia monitor. It has been especially devised for reducing gaseous nitrogen components in flue gases.

By means of a sufficiently rapid mixture of reducing agents, such as ammonia or urea, within a specified range of temperatures, nitrogen oxide compounds can be reduced without an expensive catalytic converter. But, in order to prevent an overdose of the reducing agent, the drift of the ammonia must be determined as quickly and accurately as possible.

But, as stressed by the scientists, using conventional measurement techniques, massive problems arise during sampling. Moreover, the time resolution of the measurement is reportedly severely limited. Here, the LISA procedure is likely to help. The system was developed within the context of the Tecflam project of the universities of Heidelberg, Karlsruhe and Stuttgart, the Technical College of Darmstadt, the German Research Institute for Aviation and Space, and of the Konrad Zuse Center for Information Technology, with the support of various ministries.

[The procedure] makes possible contact-free measurement of ammonia concentration, directly in the flue gas channel. Here, there is no suction; rather, a spatial integration is carried out along the stream to be measured. The system has a detection threshold of only 1 part per million (ppm) and a response time of under a minute. Thus, application in on-line operation is also possible for automatic control of the addition of the reduction agent.

## IRELAND

### **Greenpeace Warns Against EC Incinerator Plan**

91WN0600A Dublin IRISH INDEPENDENT  
in English 11 Jun 91 p 3

[Text] Ireland will become a dumping ground for poison waste if new EC rules on incinerators are agreed, Greenpeace warned yesterday.

The environment group is campaigning against incinerator use to get rid of chemical waste.

The organisation is concerned about an incinerator planned for Derry and designed to serve all of Ireland.

"The use of incinerators is based on the myth that incineration makes waste disappear. The evidence is they poison the air and threaten people's health," Irish Greenpeace, campaigner, Clare O'Grady Walsh told a Brussels meeting.

### **Government Concerned Over UK Sellafield Nuclear Waste Plans**

91WN0656A Dublin IRISH INDEPENDENT  
in English 23 Jul 91 p 5

[Article by Gene McKenna and Tony O'Brien: "Halt Nuclear Dump by Use of EC Laws Government Urged"]

[Text] Government concern at the British plan to site an underground nuclear waste dump at Sellafield was expressed by Energy Minister Bobby Molloy last night as Opposition TDs urged him to resist the expansion and, if necessary, to stop it by international court action.

As a major controversy over the British proposals blew up, Mr. Molloy has instructed his officials to seek full details of the proposed development which would consist of a £2.7bn scheme for the dumping of nuclear toxic waste at the Cumbria plant.

He reiterated the Government's opposition to the continued operation of the existing Sellafield plant and to any expansion of it.

Mr. Molloy said he had informed his counterpart in the British Government, John Wakeham, of Ireland's concerns about Sellafield during his last meeting with him in London.

The Minister said he was "extremely anxious" to see an independent inspection force being set up at EC level which would have the power to examine nuclear plants not alone at Sellafield but at all sites within the EC.

Fine Gael Energy spokesperson Mary Flaherty said the Government should immediately seek bilateral meetings at the highest level to voice Irish concern and opposition at the dump proposal.

"If there is no response from the British Government to our concerns, the Irish Government should bring the issue to the EC," she said.

Labour's Environment spokesman Brendan Howlin said the decision by Nirex—the British Government agency responsible—to use Sellafield as a nuclear dumping ground was "totally unacceptable."

He said the decision was "an insult and a contempt" for all the representations made.

Pat McCartan of the Workers Party warned of the "potential environmental disaster for Ireland" and said he was "filled with horror" at the prospect of Sellafield becoming the first deep underground nuclear waste dump in the world.

"The Irish Sea will become the main corridor for transportation of nuclear waste in the world," he said.

Meanwhile east coast local authorities are to band together in a campaign of opposition to the Sellafield development. The move was called for last night by Senator Eoin Ryan, a Fianna Fail member of Dublin City Council.

### Study Finds Post-Chernobyl Soil Radiation at 'Acceptable' Levels

91WN0657A Dublin IRISH INDEPENDENT  
in English 23 Jul 91 Supplement p 4

[Article by Frank Mulrennan: "Chernobyl Fall-Out Fades Away Says Nuke Study"]

[Text] On May 4, 1986, it rained for 12-14 hours. Nothing new in that except that the rain clouds unloaded airborne radioactivity from Chernobyl on to this country which later posed serious risks for the reputation of Ireland's food exports.

But now the results of a comprehensive study carried out by the Nuclear Energy Board have given our vital food industry a clean bill of health.

Researchers found that the vast majority of the radioactivity was retained in the land and not passed on to stock or crops.

The actual Chernobyl incident itself occurred eight days earlier on April 26, while a test was being carried out on a turbogenerator at the time of the scheduled shutdown on the reactor.

Design faults compounded by human errors led to the safety systems being closed off, and the reactor plant exploded sending lethal radioactive gases heading for Western Europe.

Ireland was the sixth most contaminated country in Europe with our mountain lambs deemed greatest at risk. There were also fears for our meat and dairy produce with at least one South American country posing serious questions over the health status of Bord Bainne exports.

The big fear was cesium-137 with its 30 year half-life, but detailed soil analysis at farming sites in the months after the incident and research by John Cunningham and Jarlath Duffy of the Nuclear Energy Board [NEB] has confirmed that acceptable levels of radioactivity exist in Irish soils.

It has also been confirmed that only two percent of this radiation was actually transmitted from the land to the grazing sheep.

Furthermore, the incidence of cesium-137 in those lambs sampled at the time fell from 2,000 Becquerels/kg to one-quarter that level within 20 days and continued falling.

The new acceptable level within the EC is now 1,250 Becquerels/kg and improved monitoring procedures under the aegis of the NEB are designed to provide much greater assurance to the population should a similar disaster ever happen again.

The Nuclear Energy Board is about to be renamed by the more apt title of the Radiological Protection Institute of Ireland (RPII)—considering that Ireland does not have a nuclear energy industry.

## ITALY

### New Gasoline Additive Found To Reduce Exhaust Pollution

91P60238X Frankfurt/Main FRANKFURTER  
ZEITUNG/BLICK DURCH DIE WIRTSCHAFT  
in German 11 Jul 91 p 8

[Text] Via the addition of Cuban, a cubic hydrocarbon, the effective output power of commercially available gasoline can be increased by around 5 percent. Cuban is a solid which is stable up to 200 degrees Celsius. The research group of an Italian automaker observed that a 447 cubic cm single-cylinder engine with direct fuel injection, whose fuel mixture was replaced with Cuban up to 30 percent by weight, managed to develop 17 kW of power at 5400 rpm instead of the usual 16 kW figure.

For the automotive firm, what appeared to be particularly interesting about the test model was that a vehicle powered by a gasoline-Cuban mixture not only performs better but

has to make fewer fuel stops, owing to Cuban's higher density of 1.29 kg per liter. For quite some time, Cuban has been produced only on a laboratory scale. However, the researchers estimate that it would be worthwhile to build a larger facility for the synthesis of Cuban. But, another fuel additive could become interesting as well. By adding minute amounts (0.0015 percent) of ferrocene—an iron sandwich complex—to the fuel, the nitrogen oxide discharge in the exhaust can be reduced by up to 40 percent. Also, the proportion of carbon monoxide and hydrocarbons in the exhaust was smaller in the test vehicle using the ferrocene additive than in a comparison vehicle.

Even the fuel consumption of the mid-sized car used as the test vehicle was lower. Both this latter and a comparison vehicle with a standard catalytic converter covered a stretch of 80,000 km. In diesel engines, owing to improved combustion, the ferrocene even reduced the discharge of soot. According to a report appearing in GIT (June 91), the laboratory's professional journal, the ferrocene additive also works favorably in older engine models whose fuels still rely upon the presence of lead alkyls. Just like the lead compounds, ferrocene protects the exhaust valve seats. This improves compression, prolongs the lifetime of the valve seats and has a positive effect upon engine performance. As the initial long-term tests with ferrocene indicate, this iron compound appears to be a technically more favorable expedient for reducing the pollutant content of automobile exhaust.

## NETHERLANDS

### Project To Ban CFCs From Electronics Companies

91AN0419A *Amsterdam COMPUTABLE in Dutch*  
10 May 91 p 9

[Text] The trade organization Holland Elektronika wishes to ban polluting chlorofluorocarbons (CFCs) from electronics companies. It aims to help companies develop alternative, CFC-free production methods and means. Through the Dutch Society for Energy and Environment (NOVEM), the Ministry of Housing, Physical Planning, and Environment subsidizes the feasibility studies undertaken within the framework of this program. In addition, the implementation of alternatives in the production process may be subsidized. The first results of this two-year project will be demonstrated during a technology day in late 1991 or early 1992.

### New Research Program on Recycling

91AN0445A *Rijswijk POLYTECHNISCH WEEKBLAD in Dutch* 16 May 91 p 1

[Text] The new Innovation-Oriented Research Program (IOP) on Recycling is ready to be started upon approval of the steering committee. Together with the Environmental Biotechnology and Prevention programs, the recycling program is part of the overall IOP on Environment Technologies.

The new IOP is based on three principles. First, R&D should focus on practical recycling applications which will be available within five to 10 years.

Second, scientific research into recycling should be adapted to the needs of industry. In addition, this research should be complementary to worldwide and European developments.

Third, networks will have to be established between research institutes, universities, and industry.

In order to realize these goals, the Recycling IOP will concentrate on the development of differentiation and separation techniques, compatibilizers, and thermal techniques. The first category consists of techniques for complex waste flows such as combinations of metals and plastics and mixed plastics. One of the problems that has to be solved is the dismantling of audiovisual equipment, as these products contain both metal and plastic parts.

Compatibilizers are used to blend different sorts of plastics. This makes it possible to process different kinds of used plastics into a new end product. The Recycling IOP is to develop new applications.

Thermal techniques include (hydrogenating) pyrolysis and gasification. They are used to process "difficult" waste flows.

STIPT, the organization which executes the technology policy of the Ministry of Economic Affairs, is supervising the new program.

This year, Economic Affairs and the Ministry of Housing, Physical Planning, and the Environment will allocate 3.75 million guilders to the Recycling IOP.

## TURKEY

### Industry's Policy, Efforts in Environmental Protection Outlined

91WN0614Z *Istanbul DUNYA in Turkish* 28 Jun 91  
p 12

[Article by Alaattin Ciftci]

[Excerpts] It has been stated that the portion of environmental pollution attributable to industry is not as great as it is thought and that this portion can be reduced even further by "environmental protection technologies." [passage omitted]

### Industrialists' Approach to Environment

The slogan of today's Turkish industrialist is: "The objective is to produce without polluting the environment and to leave a cleaner and more peaceful environment to future generations." Based on that slogan, Turkish industrialists formed the Environmental Advisory Board, the Environmental Specialty Board and the Environmental Affairs Department within the Istanbul Chamber of Commerce (ISO). Yavuz Dogan, the chairman of the Environmental Specialty Board, enumerated the basic goals of these

organizations as: "To make society and chiefly industrialists sensitive to environmental protection, to offer training and guidance that may help the solution of environmental problems, and to enhance efforts in this direction by ensuring coordination with relevant institutions." He added: "Today's rapid industrialization and the growing concentration of population in large cities have introduced new dimensions to the relationship between nature and society." Stating that ecological problems caused by the pollution of nature for different reasons have become high-priority concerns in every segment of society, Dogan outlined the work ISO is conducting in collaboration with the Istanbul Water and Sewage Authority. He said that, as a result of this collaboration, work is under way to treat effluents and to protect water basins in Istanbul and that permanent and realistic solutions to environmental problems are being sought within the framework of cooperation among universities and specialized organizations in Turkey and abroad.

Noting that the share of industry in environmental pollution in Istanbul is not as great as it is thought or portrayed, Dogan said: "For example, only six percent of the pollution in the Kucukcekmece Lake is attributable to industry. The comparable figure for other bodies of water is estimated to be 10 to 15 percent. Industrial air pollution in Istanbul, except for some areas, is negligibly small compared to pollution caused by vehicle exhausts and heating fuels."

Stating that the ISO is prepared to offer every form of training and consulting services and professional support to help industrialists implement measures aimed at environmental protection, Dogan said that industrial corporations must be given priority in gaining awareness about protecting the environment and in solving environmental problems because of the direct impact of their output on water, air, and land and the indirect damage caused by the employment they create. Dogan continued:

"The industrialist is aware of his traditional responsibility to reduce the negative effects of the sector on the environment to an unavoidable minimum and thus to set an example to other segments of society." [passage omitted]

#### **TUBITAK and Environment**

Established jointly by TUBITAK [Turkish Scientific and Technical Research Organization] and the Turkish Chemical Foundation, the Center for Environmental and Chemical Technologies (CEKTEM) offers research and development, planning, contracting, periodic control and consulting services on waste treatment systems for factories.

CEKTEM coordinator Enver Hasim Tunali summarized the capabilities of his group and said that the environment, defined as "the medium of land, air, and water in which all creatures live," is our most indispensable asset. He added: "The task of preserving this asset is incumbent upon humanity on behalf of all living creatures. Our lifelong principle must be to keep the environment clean so that we do not have to clean it."

Tunali noted that the level of development of countries is measured by their industrial might and that the chemical industry is one of the cornerstones of industry. He added that this industry has had a negative impact on the environment in our country as it has all over the world. Stating that he is pleased with the growing sensitivity of political circles to environmental issues, Tunali said that the Turkish industry has to restructure itself in accordance with environmental regulations whose practicality is being debated. These regulations envision:

- Building of new factories only in certain locations and with waste treatment facilities.
- Requiring factories that do not have treatment facilities or whose treatment processes do not meet desired criteria to build proper treatment facilities.
- Requiring factories located in critical regions of drinking water basins to move away from the region even if they have waste treatment facilities.

Noting that industry formed CEKTEM to find lasting and sound solutions to these problems of growing urgency, Tunali said: "As is known, since its inception TUBITAK has offered small and medium-sized companies with no research and development components support and services in terms of accumulated knowledge and instrumentation. Now this service will be offered in a more rational and effective manner through CEKTEM." Tunali enumerated the services CEKTEM will offer on environmental problems as follows:

- Control and consulting services in environmental issues ranging from taking specimens to the building and operation of the plant. Specifically, these services include characterization of wastes; waste treatment projects on a laboratory or pilot scale; planning and feasibility studies for waste treatment facilities; contracting and selection of construction methods and equipment.
- Construction and certification of turnkey waste treatment facilities; periodic control and consulting.
- Preparation of environmental impact reports for new chemical plants; consulting on environmental problems and treatment and minimization of waste.
- Preparation and implementation of modification projects for the efficient operation of existing waste treatment facilities. [passage omitted]

#### **Turnkey Treatment Plants**

The development of "environmental protection" technologies have paralleled the rise in environmental problems in recent years.

As firms manufacturing household and industrial waste water treatment facilities; packaged water treatment systems; conditioning systems for drinking water, pools, and industrial plants; and flue gas scrubbing units multiplied in Turkey, industrialists and touristic facilities have begun installing these systems either voluntarily or because of regulations.

Pinar Arik is the director general of Arbiogaz Construction Industry and Trade Corporation, which is one of the firms



in Turkey involved in the building of such facilities. Commenting on one of the most important of environmental problems, Arik said: "Environmental problems such as pollution caused by waste in rivers, lakes and seas; atmospheric pollution caused by flue gases; acid rain; soil erosion; and climatic changes resulting from damage to nature are debated in public on an almost daily basis, and humanity is urgently taking very serious legal and technical measures for a healthy future. [passage omitted]"

Charging that many of the waste treatment plants that have been built or are being built today are shams designed to circumvent prohibitions, Arik said that these plants also constitute a burden on industrialists in terms of investment and operation without solving environmental problems. He said: "We find during our inspections of various factories that simple and economic treatment facilities can be built with minor changes in their main production activity." [passage omitted]"

#### Sea Pollution Threat to Tourism

Stating that no attention is being paid to infrastructure in touristic regions, Arik said that a sea polluted by household wastes because of an absence of treatment facilities in those regions is threatening tourism. Noting that a solution to the problem is still being sought in septic tanks and suction pumps, Arik said that this system is outmoded and that, in addition to being unhealthful, tourists do not want to see it. He added that inexpensive and simple solutions must be phased in in these regions with help from consumers.

#### Public Education

Scientists who believe that environmental protection depends on educating the public are working in that direction. Scientific research is under way within TUBITAK and the relevant departments of universities in Turkey. Publications designed to inform the public are being drafted. One of these is the "Report on Public Education for Sensitivity to the Environment," which was recently circulated for signatures. [passage omitted]"

#### Principal Target of Education

The report identifies the segment of people to which public education must be directed and proposes that this effort begin with the residents of regions that are severely polluted and groups who make a living from the destruction of the environment, such as fishermen, hunters and farmers. The report further identifies poor people in urban and rural areas who have nutritional and health problems because of rapid population growth and workers, students and housewives who have the potential to have a strong influence on society as groups that must be given priority in education. The report summarizes legal, political and administrative initiatives and arrangements to make environmental education available to the public as follows:

- Citizens must be educated and encouraged to be sensitive and knowledgeable about environmental issues so that they can participate in decisions related

to the environment and oversee the measures that are taken.

- Strategies about protecting, developing and utilizing the environment must be identified, and a consensus must be achieved among all political parties on this issue.
- Citizens must be given the opportunity to play a more active role in environmental issues and to participate in decisionmaking processes through civilian social organizations such as cooperatives, unions, professional chambers and associations. Giving local governments a prominent role in environmental issues is a prerequisite for the more active participation of citizens on this issue.

## UNITED KINGDOM

### Antipollution Regulations Potential Economic Threat to Small Farms

91WN0602A London THE DAILY TELEGRAPH  
in English 26 Jun 91 p 9

[Article by David Brown]

[Text] Small family farmers could be forced out of business because they cannot afford to spend up to L500 a cow to improve antipollution facilities required by law, according to experts at a leading agricultural college.

Virtually all intensive livestock farms will have to spend substantial amounts on improving slurry and effluent storage facilities to prevent pollution of rivers, streams and underground water courses.

Under the new regulations, a typical dairy farmer might have to spend up to L50,000, or roughly L500 a cow, says a report from the Harper Adams Agricultural College at Newport, Shropshire.

Even farms which simply need to upgrade existing systems rather than put in new facilities, could end up paying L200 a cow because of strict design standards which will be enforced by the National Rivers Authority [NRA].

Farmers who fail to upgrade substandard facilities face fines of up to L2,000, but they can be fined up to L20,000 by magistrates, and even more in Crown Courts, if they pollute rivers and streams with effluent.

Liquid manure, the toxic liquor from stored silage and even large quantities of milk itself can devastate fish and other aquatic life in ponds, streams and rivers as well as affecting water quality itself.

Mr. Peter Bloxham, head of the Harper Adams farm waste unit, said yesterday: "Some farm businesses, especially smaller units, may well be forced away from certain livestock enterprises, particularly dairying."

He urged farmers to take independent advice, and said: "Cost is clearly going to be a serious consideration for many."

Under one rule, which has already been in force since March 1, farmers installing new facilities must make sure they have enough capacity to store four months production of animal slurry.

They must also be able to store the liquid seepage from silage at the rate of about 4.5 gallons per square yard of stored silage.

Farmers with existing storage facilities can get away with lesser restrictions if NRA inspectors are satisfied that only minor modifications are needed to bring them up to an acceptable standard.

Miss Jiggy Lloyd, National Farmers' Union water adviser, said: "Some farmers cannot afford to carry out the work and we expect some to go out of business.

"The NRA has powers to compel farmers to carry out the work and we are monitoring the way the regulations are interpreted. We have contacted the Environment Secretary and Ministry of Agriculture about this."

#### **Nuclear Electric Proposes New Program for Decommissioning Atomic Plants**

*91WN0604A London THE DAILY TELEGRAPH  
in English 26 Jun 91 p 6*

[Article by Roland Gribben]

[Text] Nuclear Electric is seeking Government clearance for new plans for shutting atomic power plants and placing them in brick or concrete "tombs" for a longer period to save almost L2 billion.

It wants to abandon plans based on dismantling all buildings outside the reactor core at an early stage and instead leave them intact inside the cocoon for 135 years.

The company, set up to take over the operation of nuclear power plants in England and Wales after the decision to abandon privatization of atomic stations, wants to use the first generation Magnox station being dismantled at Berkeley, Glos, as a "guinea pig".

Nuclear Electric believes the new program will cut total decommissioning costs for the 13 stations it operates from earlier estimates of L3.9 billion to about L2.1 billion. It would reduce the provisions made by the company to cover the costs by about L50 million a year from the last estimates.

The original strategy was based on a three-stage program involving removing the nuclear fuel, which accounts for 99.9 percent of the total radioactive content of reactors, then dismantling other plant and buildings.

The reactor unit would have been left entombed for about 100 years to allow the residual radiation to decay before final clearance.

Now the company wants to reduce the program to two stages, leaving all the plant and buildings around the

station reactors for up to 135 years before they are dismantled. The buildings would be left for 30 years initially before being enclosed within a concrete or brick structure for another 100 years.

Mr. Fred Passant, the company's waste and decommissioning manager, says the extended rundown period will allow radiation to decay naturally before undertaking any significant dismantling work.

"This reduces the technical complexities of dismantling the radiation doses to the work force and the amounts of radioactive waste produced. These in turn reduce the costs."

The plan, outlined today at a meeting of the British Nuclear Forum in London, is called the Deferred Safestore Strategy. The complete sealing of the plants means they can be safely left "for more than 100 years with the minimum of surveillance and maintenance," Mr. Passant said.

Nuclear Electric has considered burying the stations to reduce the need for dismantling but Mr. John Collier, chairman, has told the Government, the new two-stage strategy is the preferred option.

#### **Government Urged To Halt Import of Hazardous Waste**

*91WN0608A London THE DAILY TELEGRAPH  
in English 26 Jun 91 p 20*

[Article by David Fletcher, Health Services Correspondent]

[Text] The British Medical Association [BMA] called on the Government yesterday to reduce and ultimately halt the import of hazardous waste for treatment and disposal in Britain.

In a report on toxic waste and health it said the amount of waste imported was increasing substantially. Although most came from Holland, Belgium and Ireland, it also came from as far afield as Canada, Australia and America.

The BMA said all the countries sending waste were industrialized and capable of developing their own facilities to treat it.

"The movement of wastes presents a hazard in itself by increasing the likelihood of accidents; we should be aiming to minimize the distance between production of waste substances and disposal point," it said.

The report deals with all forms of waste including industrial chemicals, agricultural, sewage sludge, power station residues and medical.

It says that about 95,000 chemical substances are in commercial use and some are finding their way into the environment. Chemicals leach into the ground water from some landfill sites and only half the sites where contamination is known to have taken place have acted to control the problem.

Chemicals used in dry-cleaning which can cause cancers in animals could now be detected in some drinking water supplies.

The BMA said some waste products could cause illness and even death in those exposed to them but there was uncertainty whether they were a source of harm at low levels.

Sir Christopher Booth, chairman of the BMA's Board of Science, said: "We cannot, as doctors, completely reassure you and say there is no hazard. The question for doctors is whether there are symptoms of ill health, unrecognized by the text books, produced by the presence of these substances."

He was not aware of anyone who had died from casual exposure to waste from modern processes but illness was more likely to be a problem.

The report calls on the Government to develop a national strategy for the disposal of hazardous waste and to create a national agency to oversee all aspects of hazardous waste management and environmental health issues.

It urges stricter measures to deter illegal disposal of hazardous waste.

Industry should stop discharging waste contaminated with heavy metals into the general sewerage system and "ill-considered dumping" of hazardous substances on land or at sea should stop. There should be as much recycling as possible.

### **Project Assesses Greenhouse Effect on Europe's Forests**

*91WN0658A Leeds YORKSHIRE POST in English  
13 Jul 91 p 8*

[Article by Robert Benson: "Scientists in Forest Study Projects"]

[Text] Horticultural scientists at Britain's leading glass-house research institute are taking part in a £768,000 EC-aided project to assess the impact of the greenhouse effect on Europe's forests.

While scientists disagree as to whether there has been a recent rise in global temperature, there is no doubt that atmosphere carbon dioxide levels are growing.

Horticulture Research International's research station, at Littlehampton, Sussex, is among eight universities and institutes throughout the European Community which are studying the way in which trees will respond to predicted increases in the level of atmospheric carbon dioxide.

The research, funded by the European Commission, is worth £63,000 to HRI.

Dr. Bob Besford, leader of the Littlehampton team, believes that carbon monoxide enrichment might have beneficial effects upon forestry and that trees can in turn be used to soak up the greenhouse gas like a sponge.

"The image of the greenhouse effect is one of disaster, but from a silvan cultural point of view, high carbon monoxide will probably encourage tree growth and timber production.

"Provided that the timber is used for long-term purposes like construction and home insulation and not simply burnt or allowed to decay, the carbon can be safely removed from the atmosphere and locked away for hundreds of years," Dr. Besford stated.

Littlehampton pioneered work on plant growth in high carbon monoxide greenhouse environments, but until recently research has concentrated on herbaceous crops like tomatoes and cucumbers.

"Trees have far longer lives and many individuals will experience a doubling of carbon monoxide levels during their lifetime. At present we just do not know how they will respond," said Dr. Besford.

A molecular biologist, he will be using growth cabinets in which carbon monoxide, humidity, temperature, light intensity and daylight length can be controlled, to look in minute detail at the process of photosynthesis within leaf tissue at the sub-cellular level.

The results of the work will be used to help in the shaping of European forestry policy.

"We are trying to build into the research framework the idea of encouraging land set-aside from agriculture to be put into mixed woodlands."

### **Plans for Environment Agency Shelved**

*91WN0655A London THE DAILY TELEGRAPH  
in English 2 Aug 91 p 16*

[Article by Charles Clover, Environment Editor: "Major Shelves 'Green' Agency Over Poll Fears"]

[Text] Mr. Major has intervened to postpone the publication of plans by Mr. Heseltine, Environment Secretary, for an Environment Agency, amid concern that the proposed version of a new pollution watchdog could cause disastrous damage to the Tories' election prospects.

It has emerged that Mr. Heseltine's chosen model for creating the agency will include dismembering parts of the National Rivers Authority—described by ministers at its launch three years ago as Europe's strongest environmental agency—and hiving them off to the Ministry of Agriculture.

While claiming that the Government is united in its approach to the creation of a pollution agency, Mr. John Gummer, Agriculture Minister, has been lobbying to gain control of vital operational parts of the rivers authority, such as fisheries, land drainage and flood protection.

The agency, announced by Mr. Major last month, was first thought to be a simple combination of the National Rivers Authority and HM Inspectorate of Pollution. Under Mr. Gummer's scheme, only pollution control would remain under the Department of the Environment.

The three proposals from Mr. Heseltine are:

- Combining the rivers authority in its present form and the inspectorate in a loose federal structure, with one board responsible for all functions, including regulating waste, which the new body is to take over from local authorities;
- The combination of the two regulatory bodies, but the hiving-off of flood defence and navigation to the Ministry of Agriculture;
- The creation of a small pollution authority, around a quarter of the rivers authority's present staff of 7,500, with all responsibilities, including fisheries, flood defence and navigation, being hived off to a new body under the Ministry of Agriculture.

Mr. Heseltine is understood to favour the middle option. Lord Crickhowell and his board of the National Rivers Authority favour the first, Mr. Gummer the third.

Mr. Gummer is claiming that it is vital to separate the regulatory functions from the operating functions of the authority. Department of the Environment sources put

this down to sour grapes at the Agriculture Ministry over the loss of sole responsibility for land drainage and fisheries.

Concern about the political dangers in the creation of an Environmental Agency has prompted Mr. Major to set up a Cabinet Office committee to examine the proposals independently while he is on holiday.

The Government has been shaken by the strength of feeling among its supporters and conservationist groups—such as the Royal Society for the Protection of Birds—that the principle of managing all aspects of a river within the same body should remain.

The Government is under pressure to come up with legislation to create an Environment Agency by the autumn, so that it can be set up before an election.

A consultation paper on the proposals for the agency was expected by next week. Some Government sources are saying that it will now be weeks before Mr. Major is satisfied that the problems have been resolved. He is thought to be wary of the reorganisation turning sour, as it did over the Nature Conservancy Council.

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