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TRANSLATIONS ON ENVIRONMENTAL QUALITY

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LEGISLATION TO CONTROL POLLUTION

Christchurch THE PRESS in English 10-11 Mar 77 p 2

/Text/

New legislation to control pollution in New Zealand harbours was in the pipeline, said the Minister of Transport (Mr McLachlan) yesterday.

Mr McLachlan, opening the annual conference of the Harbours' Association, said that legislation was being drafted to incorporate into the Marine Pollution Act, 1974, the 1973 international convention for the prevention of pollution from ships.

The convention controlled the discharge from ships not only of oil but dangerous chemicals, garbage, and sewage, he said.

"An important provision is the requirement for ports to provide facilities for the reception and treatment of residues and contaminated ballast water that cannot be discharged into the sea," said Mr McLachlan.

"I expect that most major ports in New Zealand will have to improve their facilities in order to meet the new requirements, and my Ministry has written to your association about this.

"Most ports in New Zealand have provided the necessary facilities for the reception of oil residues, as at present required. What is needed now is for the harbour boards to provide the additional facilities to maintain this even higher level of anti-pollution equipment by the time the convention comes into force internationally, probably by 1980."

CSO: 5000

ANTI-POLLUTION LEVY SOUGHT

Christchurch THE PRESS in English 10-11 Mar 77 p 3

/Text/

All ships on the New Zealand coast will have to pay a special levy to finance emergency equipment to fight oil spills, if the Harbours Association gets its way.

At its annual conference in Christchurch yesterday the association accepted in principle a remit calling for a fund to be established to buy anti-pollution equipment and to pay costs incurred in cleaning up oil spills where these costs could not otherwise be recovered.

The association agreed that the details of the proposal would have to be worked out by its executive committee and with the Government.

In putting the remit, the Wellington Harbour Board said there was growing world-wide awareness of the need to protect the environment — a sentiment echoed by the Government, which had ratified various international conventions concerning marine pollution.

However, a member of the Bay of Plenty Harbour Board, Mr R. A. Owens, said that it was not the ships but the oil that was the problem. Therefore the oil should be levied — and this could be done simply by adding a cent to the tax already imposed on petroleum sales, and siphoning this off into the special fund.

The association agreed to consider levying both ships and oil.

CSO: 5000

CSSR CONSERVATION EFFORTS DISCUSSED

Care of Forests Is Vital

Bratislava SMENA in Slovak 22 Apr 77 pp 1, 4

[Article by Eng Augustin Mistrick, SSR deputy minister of forestry and water management: "From the Forest"]

[Text] The rapid scientific and technical progress at the present time has created favorable conditions for the increase in material production, which is one of the prerequisites of a higher standard of living. It becomes, therefore, increasingly urgent to supply production with the necessary raw materials primarily of domestic origin, among which wood, the product of our forests, occupies an important place.

Wood has always been and still is one of the most important materials--not only because of its relatively abundant supply, systematic renewal of its resources, relatively simple workability and the high and useful value of products made from it, but also because its use does not seriously endanger the living environment. Its exploitation and processing has passed through several developmental phases and the range of products made from it constantly increases. The number of its potential uses from the original 2,000 increased tenfold during the last five decades. This wide application of wood as the basic raw material together with its esthetic effect and virtually inexhaustible raw materials base--when properly managed--predetermine this substance as material significantly affecting our living environment also in the future. In view of the relatively large area occupied by forests in our state and particularly in Slovakia, where the forest land constitutes 38.73 percent of the total area, forestry is a major factor as one of the sources of further increase in the efficiency of the national economy.

Forests, however, do not constitute only a source of raw materials; their primary importance lies in the favorable effect on the climate, precipitation, watershed and protection of soil, and their esthetic importance and recreational use constantly increase in today's industrialized world. Together with

water reservoirs, the forest land is the regulator of rain water flow. The forests, especially those located around the source of rivers and their tributaries, constitute the principal part of our water management system. The fact that the ratio between the minimum and maximum water flow reached the value 1:62 in river basins with 83 percent forest land, but the value 1:837 in river basins with 31.2 percent forest land proves that forests effectively reduce and retard the run-off of rain water.

Attention paid by our society to the problems of forest management increases in direct proportion to the importance of forests. Property relations have undergone a fundamental change. As of 31 March 1977, the state sector manages 1,859,621 hectares or 98.1 percent of the forest land in the SSR, the JRD [unified agricultural cooperatives] 22,500 hectares or 1.18 percent, and the private sector only 4,939 hectares or 0.26 percent. By the abolition of private ownership of forests, of scattered land holdings, the conditions have been created for a systematic application of principles beneficial to the society in economic methods.

The 15th CPCZ Congress therefore set an ambitious goal for forest management: "to promote further increase in the forests' production capacity and to make cultivation more effective by a more extensive use of appropriate seeds and seedlings, by the improvement of forest soil and by paying careful attention to young trees." This means that forestry workers will plant new trees on the area of 19,400 hectares in 1977 including 6,000 hectares of so-called nonforest land which was earmarked and transferred from farm land for this purpose.

The forestation of this area will make it possible that the clearings as well as nonforest land will not only participate in future timber production but also improve the ecological conditions of the country. Young growth will be controlled by pruning on the area of 31,500 hectares and by selective felling on the area of 92,700 hectares. The type and quality structure of trees will thus improve and their resistance to calamities increase. In accordance with the forestation requirements 140 million seedlings will be produced. At the same time, measures are being taken to increase this production in conformity with the increasing annual targets for forestation of nonforest land, which should amount to approximately 8,000 hectares by 1980. This goal will be achieved primarily by better care of the existing forest nurseries and further intensive concentration of production in the nursery centers, which will be provided with the latest accessible equipment, technology and modern social facilities. About 8,900,000 korunas will be invested in 1977 to achieve this goal.

In accordance with the increasing production capacity of forests, 2,264,000 m^3 of evergreen utility timber and 2,543,000 m^3 of deciduous timber will be produced in 1977. The shipments of evergreen timber will amount to 2,180,000 m^3 and of deciduous timber 2,229,000 m^3.

In our lumbering operations we place more emphasis on economy and quality of production. This will involve more systematic technological preparation of the working places, their more purposeful concentration and other progressive organization of production technologies and work procedures, particularly in the comprehensive gangs in accordance with the introduction of more efficient equipment in handling and hauling of lumber. Especially complex relations--between the rationalization of lumbering operations and the needs for the protection and increase of forest functions apart from timber production--will be resolved with the help of comprehensive rationalization brigades.

A particularly difficult task will be the processing of approximately 720,000 m^3 of timber from the trees felled during the wind and snow disaster in December 1976, which for the most part sporadically damaged primarily young evergreen trees in the central Slovakia Kraj.

We regard the deliveries of timber--the last phase of material forest production--as one of the key problems of supplying the national economy with the wood material. The deliveries of timber will reach the index value of 102.4 percent. This sphere of activity, which depends upon the availability of railroad transportation, mobility of inventories and so on, will require flexibility in the solution of the arising problems.

Further mechanization of operations and several tasks involving technical expansion constitute an important part of the program of comprehensive socialist rationalization in forestry for 1977. As a final effect, this will result in the relative reduction of the labor force by 590 workers and saving of Kcs 17.8 million in costs.

Mechanization of lumbering operations will continue in accordance with the higher targets set for the elimination of hard work. One can realistically assume that the planned degree of mechanization will amount to 89.2 percent by the end of the year. The fundamental prerequisites have already been created for a positive increase in the qualitative level of mechanizing the production process, particularly by employing on a larger scale special domestically produced tractors with a high wheel output in handling operations. We hope to get from our industry this year 50 LKT 80 special forestry tractors, 42 universal wheel tractors, especially equipped for forestry operations, as well as caterpillar tractors from the USSR.

As far as hauling of timber is concerned, we shall continue in the qualitative modernization of our fleet of transportation vehicles within this year's allocations by purchasing 75 trucks. Since the rate of replacement of trucks falls short of the requirements of forest management, the achievement of hauling targets will be among the most difficult tasks of 1977.

Although we certainly have mobilizable reserves in the employment of more efficient equipment, and especially in its potential effective use, the necessity of operations in difficult terrain and in scattered places of work

characterizes an unproportionately greater dependence of forest management on workers than is the case in other sectors. A great need for live labor naturally calls for the creation of tolerable working and living conditions for the workers directly participating in the production process. Although Kcs 20 million more were spent in 1976 than in 1975 for housing purposes and common accommodations--in fact 68 million more in 1976 than in the preceding year for social welfare, including the measures for occupational protection and safety--this effort has not been as yet favorably reflected in the reduced number of occupational injuries, in the increased proportion of permanent workers or in a more drastic change in the utilization of the working time. The comprehensive welfare programs for workers have become an integral part of the enterprise production and financial plans. It is important now to improve workers' welfare through the implementation of approved measures and, together with the introduction of appropriate equipment, to make the work in forestry more attractive for the young people.

The parts of our state covered by forests are increasingly becoming the place of deserved rest for the working people. A prudent economic policy pursued in direct relation to the societywide functions of forests is the prerequisite for the gradual improvement of the function of the forest land as one of the most important factors in the natural, and thus also living, environment. The total area of special-purpose forests already is 436,000 hectares or 23 percent of the forest land in the SSR today.

A complete General Plan of the Bratislava Forest Park with the area of 17,000 hectares of forests will be submitted to the national committee of the capital of Bratislava this year. The work on this plan took 3 years and the project, when completed, will be the first one of this type on the CSSR territory.

In accordance with the already approved plan chart, the general plans of the Kosice forest park with the area of 7,000 hectares and of the Nitra forest park with the area of 2,400 hectares will also be completed this year. The project of the Dukla forest park will also be submitted so that the planned celebration of the 35th anniversary of the Carpathians-Dukla operation could take place in already landscaped environment.

The work will start this year also on the forest parks for Povazska Bystrica, Zilina, Zvolen, Rimavska Sobota, Michalovce and Roznava.

In accordance with the already approved flow chart for the development of forests for health and recreational purposes, a project will be worked out for a forest adjoining the Smrdaky spa, and gradually plans will be drawn for the development of forests adjoining the following spas: Brusno, Trencianske Teplice.

The enthusiasm over the recent tremendous technological progress, which was followed by the hope and demands of mankind for gaining the maximum for raising the standard of living, has been replaced in many countries today by the fear of the impending shortage of pure water and anxiety over the noise and

pollution of environment. Society's former lack of interest in forest management and production methods in forestry has been superseded by great interest bordering on a sentimental attitude towards the forests. Neither of these extremes benefits society. For this reason we forestry workers are trying to demonstrate that interventions are beneficial to the forests, that the purpose of our management is a balanced use of forest land not only for timber production, but also for the benefit of the entire society. Our effort, however, can be multiplied by the positive contribution of those who come to the forests for short- or long-term recreation. We hope to find in them sincere fellow-workers who protect the forest environment in order to make it more attractive not only today but also in the future.

Ore Mountains Need Special Attention

Prague SVOBODNE SLOVO in Czech 23 Apr 77 p 10

[Article by Frantisek Raven: "Treat the Forests Like Your Own Garden"]

[Text] Battle for Ore Mountains [Krusne Hory] Forests

There have always been conscientious managers of forests in the area of the Krusne Hory. For example a remarkable map drawn on the plotting paper in 1575 which covers the area around the castle Kysperk nad Bohosudovem has been preserved; the types and summary age of trees growing there at the time are marked on it. They were removing broken trees already in the 16th century and tried to eradicate the bark-boring beatles for the first time in 1699. They scrupulously observed the national forestry code for Bohemia issued in 1754 which forbade the devastation of forests and promoted their protection and reforestation.

The workers in the forests of north Bohemia at the present time are motivated by the same noble goals. They must, however, combat new enemies of forests--primarily the effect of the fallout of the emissions of sulfur dioxide and other harmful substances including nitrogen dioxide, toxic materials (particuarly heavy metals) and gaseous fluorine compounds. These emissions caused a substantial damage to the trees in this area during the 1960-1975 period: the area with slightly damaged trees increased from 18,329 hectares to 26,660 hectares, with considerably damaged trees from 6,395 hectares to 17,265 hectares, with seriously damaged trees from 1,196 hectares to 4,268 hectares and with drying trees from 56 hectares to 1,226 hectares. Emissions attack mainly the coniferous evergreen trees, but adversely affect also the deciduous trees. They soak into the soil, impair its quality and necessitate planting of new trees with a complicated procedure. Many trees must be felled ahead of schedule. This causes losses in the quality and quantity of timber, and the reforestation because of its frequency and scope becomes very expensive.

Previously they used to reforest approximately 470 hectares in the area of the Krusne Hory annually, but it was already 1,329 hectares last year. The North Bohemia State Forests national enterprise had to plant more than 14 million evergreen and 8.25 million deciduous seedlings in the area of 3,682 hectares which is under its jurisdiction.

General Plan

In view of these certainly weighty reasons, the CSR Government passed a resolution in April last year which served as the basis of a general plan for the development of forest land in the area of the Krusne Hory with reference to the forecasts of the trend in air pollution and to all main functions of forests (timber production, water management, recreation, hydrometeorology and others). The outline of this general plan should be ready by the end of the year. It will be a joint product of research institutes, appropriate national committees and economic organizations. Its essentially already completed sections contain documentary material on air pollution, including forecasts; the trend in the degeneration of forests in the area of the Krusne Hory (again including the forecasts); background material for the main functions of these forests; an economic evaluation of the effect of exhausts on forest management; plans for further development of forests under these complex conditions and also specific tasks and measures. The plan will become a live, constructive document representing a combined effort of all who are determined, in accordance with their abilities and existing possibilities, to contribute to the best possible preservation of forests in the Krusne Hory even under these more difficult conditions, so that they can perform their important functions in the best possible way and actively contribute to a better living and working environment. The plan will also serve as a timely warning for heavily industrialized areas in other parts of the republic in which a similar danger of industrial exhausts begins to appear.

Other Concrete Actions

In addition to the work on the above general plan, economic workers of course continue in their everyday effort to minimize the effect of harmful emissions, while forestry workers pay foremost attention to the prompt felling and removal of dry and drying trees and to the reforestation. Evergreen trees indigenous to the area of the Krusne Hory are not planted anymore. On the basis of scientific research and conditions, they now plant so-called imported "introduced," that is, exotic trees. Predominant among them is blue spruce, native to North America. They planted it approximately 55 years ago--not because of the air pollution, but in order to make use of the completely exploited peat bog--on the St Sebastian Mountain [Hore Svateho Sebastiana], which is one of the areas most exposed to harmful fumes now. It is still in good shape because it resists emissions rather well. Also in Flaje, where it was planted approximately 15 years ago, its growth is promising. Another exotic tree is maraana spruce, which also is native to North America. The Litvinov forestry center has been following its culture for 10 years. Grey spruce is the third time-tested "American." The fine, widespread pancic spruce, imported from the Balkans, appears to be promising. The twisted pine also is promising. It has proved successful in the GDR, where the weather conditions are, of course, incomparably more favorable than in our country. The short-term, but very strong and, therefore, more harmful emissions do not occur there in foggy weather as they do in our country.

The planting of these "exotic" trees will definitely not become fashion. They are more expensive, grow more slowly and their wood substance is inferior and the yield, therefore, lower. Our slender spruce is superior to all of them! It will again return to the Krusne Hory after all coal in the north Bohemian basin is exploited. Under the present conditions, however, the exotic and deciduous trees including rowan [mountain ash] and birch are definitely better than nothing at all.

Like in Your Own Garden!

It is perhaps most appropriate to ask those who know very well the difficulty of basic protection of forests, namely, the employees of the enterprise directorate of the North Bohemia State Forests, the following questions: "What do you wish the visitors of forests to do and not to do there?" Vladimir Knotek, engineers Jirgl, Kubelka and other give an almost identical answer: "We want them to go there as to their own garden or to the garden of their good friend. There, they do not destroy anything, do not step on plants, do not break branches, do not throw away cans, bottles and paper. On the contrary, they pick up trash, pull out the weeds, behave tactfully toward birds and animals, do not frighten or even chase them."

Let us therefore remember these wishes whenever we wander in the beautiful giant forests, even though we occasionally come across a mess [of lumbering waste] in the forests which is atypical of the gardens. After all, our forestry workers, even though they are doing their best, cannot take care of everything. But for esthetic reasons and because of the potential fire danger, pieces of wood remaining after lumbering operations begin to be burned or otherwise used, at least in some lumber centers.

When spring comes, the forests again become an enormous garden for hundreds of thousands of citizens. If these hundreds of thousands of citizens were familiar with the situation in the forests of the Krusne Hory area, they would appreciate every cluster of shrubs. Let us therefore behave in the enormous forest garden as we would in our own garden or in the garden of our good friend, not only during the Month of Forests, but during the entire year.

CSSR Position on Water Conservation

Prague MLADA FRONTA in Czech 22 Apr 77 p 3

[Interview with Eng Vaclav Plechac, CSR Ministry of Forestry and Water Management and member of the delegation to the UN Water Conservation Conference, by correspondent Milada Surova: "Shall We Be Able To Avert a Worldwide Water Crisis?"]

[Excerpts] The first UN worldwide conference on water conservation took place in the Argentine city of Mar del Plata. It was attended by approximately 2,000 delegates from 16 UN member countries.

[Plechac] The developing countries want to bring quality water to every village. By that they usually mean constructing a public pump, a fountain or freely accessible waterspouts in several places of every community, where one can go to fetch water. That means one should not waste but save water and also facilitate work for women who in some areas must go several kilometers to bring water to their households. Our problem is different. We want to secure a water supply for everybody in our country, to make it available to every apartment at the mere turn of the faucet. We estimate daily water consumption at more than 450 liters per capita by the year 2000.

[Question] What is the crux of the worldwide problem?

[Plechac] In the first place, the population must be supplied with drinking water. Second, there must be irrigation projects without which the worldwide problem of hunger cannot be solved. Czechoslovakia is atypical in this respect. Only 1-3 percent of the available water supply is used for irrigation in our country, while some states use 30-50 percent; the developing predominantly agricultural states use 70-90 percent, and in India even more, for this purpose. Water supply to industry ranks only third worldwide. It poses a major problem in our country today, although water consumption per unit of production has declined continuously since 1961. Water supply to industry poses a problem of purity rather than of quantity, both in our country and abroad.

10501
CSO: 5000

GDR RATIFIES CONVENTION ON PROTECTING BALTIC SEA ENVIRONMENT

[Editorial Report] The GDR GESETZBLATT (LEGAL GAZETTE), Part II No 8 published in East Berlin on 27 April 1977 carries on pages 110-148 the text in both German and English of the "Convention on the Protection of the Marine Environment of the Baltic Sea Area" which was drawn up at Helsinki on 22 March 1974. Preceding the convention on page 109 is the "Announcement Regarding the Ratification of the Convention on the Protection of the Marine Environment of the Baltic Sea Area of 22 March 1974 by the German Democratic Republic of 16 February 1977" signed by H. Eichler, the secretary of the GDR State Council. The announcement states that the Convention was singed on 22 March 1974 for the GDR, that the GDR State Council ratified it on 5 November 1976 and that the ratification instrument was deposited with the Finnish Government on 6 January 1977. The announcement further states that the date on which the convention comes into force in the GDR will be announced in the LEGAL GAZETTE.

The convention itself consists of 29 articles and seven annexes. The articles define such terms as "pollution," "dumping," "harmful substances," etc. The articles also set forth provisions for such things as "principles and obligations concerning land-based pollution," "prevention of pollution from ships," "prevention of dumping," "responsibility for damage," "settlement of disputes," etc. Article 12 provides for setting up the "Baltic Marine Environment Protection Commission."

The annexes contain lists of specific hazardous and noxious substances that contracting parties are expected to prevent, to the extent possible, from contaminating the Baltic Sea area. In addition, the annexes contain further definitions for the purposes of the convention of such things as "ship," "discharge," "jurisdiction," etc. Definitions of "noxious liquid substances in bulk" and conditions for discharging such substances, lists of such liquids, lists of oils and of other liquid substances carried in bulk are included in the annexes. Annex V deals with "Exceptions From the General Prohibition of Dumping of Waste and Other Matter in the Baltic Sea Area" and Annex VI deals with "Co-operation in Combatting Marine Pollution."

CSO: 2300

CHEMICAL INDUSTRY FACES AIR POLLUTION PROBLEMS

Warsaw PRZEMYSL CHEMICZNY in Polish Feb 77 pp 57-58

[Article by Jerzy Werner, PROAT Air Pollution Control Design Office, Szczecin;
"Problems of Air Pollution Control in the Chemical Industry in 1976-1980"]

[Text] Problems related to the preparation of investment tasks in the chemical industry are discussed from the viewpoint of air pollution control. Technical possibilities for limiting emissions of various pollutants and orientational estimates of investment outlays related to various methods are presented.

After the power industry and heavy industry, the chemical industry holds third place in the amount of emissions, but it emits a whole range of pollutants, including substances with particularly toxic properties (Table 1). The sizes of emissions in the chemical industry are estimated to be as follows (in thousands of tons per year):

	1970	1975	1980
gases	543	547	721
dust	227	242	268

It follows from this that the basic problem is to limit emissions of gas pollutants, although it would also be useful to reduce dust emissions, a task which is entirely possible in technical respects.

The substances emitted are highly toxic, and a presentation of the amount of substances emitted and toxicity shows how grave the problem is. Most plants of the chemical industry usually emit several or a dozen and some types of pollutants at the same time, and their effect spreads, placing greater limits on the amounts which must be eliminated.

The location of the chemical industry in Poland is focused in the industrial regions along the following belts: a southern belt from Debica to Brzeg Dolny, a central belt including Warsaw, and an area in the north in Gdansk and

Table 1. Percentage Breakdown of Gases Emitted by the Chemical Industry and Their Toxicity

Substance	Percentages	Concentration Permissible on Earth's Surface (mg/m^3)	
		20 Minutes	Per Day
Sulfur Dioxide	48	0.9	0.35
Sulfuric Acid (mist)	3	0.3	0.1
Nitric and Nitrous Oxides	7	0.6	0.2
Carbon Monoxide	16	3.0	1.0
Hydrogen Sulfide	1.5	0.06	0.02
Carbon Disulfide	3	0.045	0.015
Fluorine	0.5	0.03	0.01
Hydrocarbons	16	2.0	1.0
Others	5	----	----

Szczecin. These regions have already a full background for basic pollutants, and further development of the chemical industry will be limited by the amount of the pollutants emitted.

Existing standards for permissible concentrations are very important. Their levels provide initial data as a starting point in the design of new plants and the expansion of existing plants, and the necessity of adhering to them stimulates the size and method of production and determines costs. On the other hand, their attempted revision rests beyond the scope of the Ministry of Chemical Industry, and their numerical sizes are correlated with others on the European scale based on several decades of research and experience in highly developed countries, largely the United States, USSR, Japan, and Great Britain. A basic effort in the Ministry of Chemical Industry is to carry on production while staying within air pollutant emission limits.

Proper Preparation of Investment Tasks from the Viewpoint of Air Pollution Control

An analysis of the chemical industry conducted in many countries and published for the United States, has shown that from the viewpoint of air pollution control:

The chemical industry uses several hundred processes and operations in its technology,

The number of raw materials, partly finished products, and products runs into the thousands,

The types, quantities, and composition of the pollutants emitted give a hard-to-define number of cases to be practically resolved,

No solution to air pollution control problems must be at the cost of making the water economy and waste-water management problem worse or of increasing the amount of solid waste.

In the 1960's the chemical industry was given the task of seeking out so-called pure technologies, those without waste products. As the result of a dozen and some years of work in this direction, certain results have been achieved, but it is estimated that no more than 30-40 percent of the technology used or newly designed make it possible to carry on production without emitting toxic gases. Technical progress has taken on a broader scope in this situation. For most production technology in plants of the chemical industry it is essential to use special technologies for processing waste gases and make them fit plant conditions, but such technologies can be applied after appropriate organization of the waste gases. The whole area of processing waste gases has its own specific characteristics in technologies, apparatus, regulation and control of processes. This is an area based on the processes and technologies used in the chemical industry, but it can also be applied on the scale of all industry. Progress in this area in Poland is presented in Table 2. In cooperation with plants and with scientific institutes, foundations have been prepared for the design of most processes and operations used for air pollution control.

The production of apparatus for environmental protection is a separate problem. The situation here is still more difficult than with the production of technological equipment.

Very often the dispersion of gases with high guns is the method used. This technique is controversial, owing to the transmission of harmful substances. Up to the present the power industry has been using this method, although in countries which have a simultaneous limit on concentrations in the layer next to the earth and the size of the emission, it is not possible to meet air pollution control requirements in this way.

The technique of protective zones, a technique which isolates the plant and also meets general restrictions on emissions into the environment, was developed in conjunction with the regional plan, on the one hand, and the general plant plan, on the other.

There are some possibilities of linking the method of conducting production to the condition of air pollution in a given region. Measurement systems near the plants provide detailed observations of this situation. Results of observations of chemical industry systems in conjunction with results of continual measurements of emissions at the main launchers make it possible to conduct production in the plants without causing inconvenience. In disputed cases the results of the measurements can serve as evidence.

Without going into technical details we can say that from the technological standpoint the chemical industry can substantially reduce its emissions.

Program Preparation of Investment Tasks from the Air Pollution Control Viewpoint

The proper solution of air pollution control problems to a great extent depends on taking these problems into account sufficiently early in keeping

Table 2. Limiting the Emissions for Basic Gas Pollutants

Pollutant	Source	Present Technological Possibilities for Solution	Course of Action Proposed
SO_2	Power-producing processes	None	Conduct research on selected technology, follow progress
SO_3/SO_2	Sulfuric-acid production	Existant	Pilot projects, inculcation, planning
H_2S, RSH	Stratal waters, sewage treatment, cellulose and paper industry, synthetic fibers industry	Limited	Planning, pilot projects Planning, pilot research
NO, NO_2	High-temperature combustion of HNO_3 production, nitration processes, waste-water	None Existant Limited	As for SO_2 No conclusions
Other N-, such as amines, pyridines	Fat industry, pyridine solvents, amines	Existant	Pilot design research
Cl_2	Production of hydrochloric acid, chlorine, chlorination, PVC combustion	Existant	Pilot design research, pilot projects
HF	Phosphorous fertilizers, aluminum production	Existant	Offer pilot research
SiF_4	Fertilizer production, ceramic industry	Limited	
CO, CO_2	Complete and incomplete combustion	None	Follow progress
Hydrocarbons: parafine, olefines, aromatics	Refining, petrochemical industry, operations with volatile substances and solvents (production, transportation)	Limited	Designing, pilot research
Aldehydes, ketone, alcohols, phenols	Petrochemical processes, partial oxydation, production of substances and coatings	Existant	Pilot research, design
Chloroorganic compounds	Purification, degreasing	Existant	Designing
Odors	Food industry, coating	Existant	Designing

with the "alfa" system. Catalogue cards should fully reflect the air pollution control components. Problems to be solved in the realm of air pollution control should be described in detail sufficiently early in the research and development task cards. The concept for the implementation of the plant development program [Koncepcja Realizacji Programu Rozwoju Zakladow = KRPRZ] in the joint catalogue cards [Karty Katalogowe Zbiorcze] for investment undertakings must contain full information on the scope of the air pollution control problems, the methods for resolving them, and the outlays anticipated in connection with this goal. These materials will make it possible to select completely the data for analysis, from the environmental protection viewpoint, and to provide confirmation for the KRPRZ drafted by the plant or provide the basis for another thorough analysis of the problems.

In keeping with the intent of the "alfa" system, official inquiries concerning information about the area should represent an informational link to the system for planning the development of the regions and macroregions within the local coordination bodies. Figure 3 of W. Zak's article in this same issue of PRZEMYSL CHEMICZNE showed the relationship between investment documentation and the legal documents necessary for obtaining the appropriate approvals. The attainment of a positive "official response" is the point of departure.

We should say a few words about so-called "turn-key investments." Air pollution control specialists are brought into the process of getting investments ready at far too late a point. The requirements made of parties bidding on the contracts are general in nature, and air pollution control problems are not part of the discussion. The results of this are difficult or impossible to correct at the later stage of production.

Estimates of Outlays

The preliminary assessments of needs in the realm of air pollution control already show that the meeting of the requirement that production not create an environmental nuisance is a grave economic achievement. The ratios concerning the amount of total outlays devoted to air pollution control are estimated to range from a few percent to a dozen and some. Efforts in this area must also be scrupulously weighed, as with basic production technology. Selected examples of costs are given to illustrate the costs of air pollution control. Installation in the realm of air pollution control costs as follows:

recovery of solvents -- about 15 million zlotys,

installation to limit emissions (of varying amounts), operating on the absorption principle -- from 2 to 15 million zlotys,

furnaces for thermal, catalytic combustion -- from 1 to 20 million zlotys,

protection zone for a small plant -- runs in the tens of millions of zlotys, for a complex -- a few hundred million zlotys,

measurement system in the region of a complex -- from 20 to 40 million zlotys.

In cooperation with plants and leading technological offices the Proat design office has presented the needs of the chemical industry in Poland in the realm of air pollution control for the years 1976-1980. According to estimates of plant management, in order to meet the basic requirements of local officials 3.2 billion zlotys is essential for indispensable needs and Proat estimates the full needs in this area to be on the order of 9 billion zlotys. The air pollution control outlays which should be allocated in the ministry of the chemical industry are so high that charges for this are beginning to be a considerable part of the costs of production.

There is an urgent need to estimate the losses which the national economy is bearing when emissions are discharged into the atmosphere. So long as the discussion bears the nature of a difference of opinion between ecologists and engineers, it is impossible to adopt a definite position.

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CSO: 5000

CHEMICAL INDUSTRY INCREASES INVESTMENTS IN ENVIRONMENTAL PROTECTION

Warsaw PRZEMYSL CHEMICZNY in Polish Feb 77 pp 54-56

[Article by Mieczyslaw Wolff, Biprowod Water and Sewage Management Project Office: "The Problem of Environmental Protection in the Chemical Industry Vis-a-Vis Environmental Protection in the Country"]

[Text] The question of preventing water and air pollution is discussed from the viewpoint of the current situation in the chemical industry compared to that throughout the country. The activity of the Prochem-Biprowod group's project design office is outlined.

The 20th Century is characterized by the spontaneous development of industrial civilization, sudden urbanization, activation of agriculture, and in this connection the phenomena which upset the balance of the natural environment, as manifested in changes in the system of water relationships and the composition of the water, air, and soils which form the foundation of human existence. These changes have been particularly severe in the United States and Europe, because the problems of the natural environment stem from economic development. It was not until the middle of this century that we became aware that if the environment is wastefully exploited its resources will be rapidly destroyed and further possibilities for development thus hampered. Environmental protection was pushed to the forefront of political issues (for example, U Thant's 1969 report and the 1972 conference in Stockholm). In recent years state bodies interested in the problems of protecting the environment have been created in many countries.

In Poland, the Sejm law of 29 March 1972 created the Ministry of Administration, Local Economy, and Environmental Protection, or MAGTOS, whose scope of activity includes problems of preventing water and air pollution, protecting growing things, excessive noise and vibration abatement, and waste treatment and management. MAGTOS was created, because although the course of changes in the quality of the environment in Poland corresponds to the mechanism observed in other countries, the extent of damage to the environment is nonetheless quite substantial in comparison to the scale of industrial production. This is also the result of many years of

neglect, which sometimes goes back to the beginning of our century, for example, in water and waste-water management, as well as the result of the fact that there are many old plants in which it is often impossible to construct environmental-protection installations. In highly industrialized countries the reconstruction of industry basically occurred during the 1950's. The majority of the factories intensively expanded after the war were not outfitted with environmental protection equipment. This problem was not noted until 1950-1960, and the more substantial outlays for these purposes were allocated in 1965-1970. In 1966 when locations were determined for factories, the problems of the environmental impact were not taken into account. This fact led to a number of unpleasant problems for the towns, national parks, and other adjacent areas. Water pollution and emissions of pollutants and gases into the air are the most noticeable in our country.

The Question of Water Pollution Control Throughout the Country

Contamination of the water and the growing shortage of water resources are the factors affecting the water economy in Poland and the quality of the environment. The pollution and contamination are affecting first of all the surface waters of rivers, brooks, and lakes, as well as the water in ports and the coastal waters of the Baltic. This pollution is the result of dumping waste-water into the water, particularly waste-water which has either not undergone treatment or has been treated only mechanically. The amount of waste-water is constantly on the increase along with the rise in the demand for water.

The amount of waste-water put directly into the surface waters in 1974 amounted to 8.2 billion cubic meters in 1974 (8.6 billion in 1975). The waste-water accounted for about one-seventh of the mean annual runoff from Poland and consisted mainly of industrial waste and municipal waste requiring treatment (2.3 billion cubic meters) and water for cooling (5.3 billion cubic meters; 6.2 billion in 1975). The Ministry of the Chemical Industry dumped 1.1 billion cubic meters of waste-water, which is 13.5 percent of the total quantity, and this included 0.6 billion cubic meters of waste-water requiring treatment, or 26 percent of the total amount. Of the waste-water which should be treated, 35 percent was put into the water without treatment of any kind. This figure was 27 percent for the Ministry of the Chemical Industry. It has been calculated that by 1990, at the past rate of increase in water consumption, only 3 cubic meters of mean annual rainfall runoff will exist for every cubic meter of waste-water.

The clear shortage of surface waters aggravates the already difficult situation in terms of water resources in the country. Some 99.8 percent of the area of Poland is part of the catchment area of the Baltic Sea, a sea basin which our country and the other countries on the Baltic are particularly concerned about protecting against pollution. This fact is demonstrated by the international agreements which have been recently signed. Some 88.1 percent of the territory of Poland is located in the river basin of our

two largest rivers, the Vistula and the Odra. The total surface water resources in our country are estimated at 31 billion cubic meters per year, of which 23 billion cubic meters per year are utility resources in an average dry year. Poland places far down the list of the 28 European countries in terms of water resources, and holds 22nd place. When we take into account the fact that even in 1970 water consumption exceeded 10 billion cubic meters per year, or nearly half the total available resources, we can draw the conclusion that plans related to the development of industry in Poland must take into account the factor of how much water production consumes (and the degree of water pollution) as parameters which limit freedom of choice in selecting production technology and location.

The chemical industry's consumption of water in Poland amounts to 12 percent of the country's total needs and about 21 percent of the water used by industry. In absolute figures this consumption amounted to 1.1 billion cubic meters in 1970, 1.5 billion in 1975, and will reach an estimated 2.3 billion by 1980. Correspondingly large quantities of waste-water require treatment; 0.6 billion cubic meters in 1975, and by the year 1980 this figure is to reach a billion cubic meters.

Three classes of purity have been established for inland surface waters in the country, depending on intended use. On the basis of the most current analysis of water purity conducted for the 117 major rivers of the country (including the Vistula and the Odra), it was found that the following percentages apply for the various classes of water purity:

	1970	1975
Class I (drinking water)	25.2	16
Class II (for recreation purposes)	33.7	
Class III (for industry and agriculture)	17.7	
No class	23.2	30

The great dumping of waste-water is making the river pollution very great. The water of the Vistula, with the exception of a short section (river source) and that of all the Odra is unfit for transportation purposes. This situation is similar for the Wart and the Bug. Of the large Polish rivers, only the Narew above Ostroleka has pure water. Many sections of rivers have water which does not meet basic standards and therefore is unfit for use. In recent years the pollution of the Vistula has increased further. The worst situation is noted in the following voivodships, in which the extent of nonclassed rivers under study is expressed in percent as follows: (according to the administrative division prior to June, 1975)

Katowice Voivodship	about 70 percent
Opole Voivodship	about 73 percent
Lublin Voivodship	about 54 percent
Wroclaw Voivodship	about 53 percent.

Direct pollution of subsurface waters is a rather frequent phenomenon, but its scope is not very great. It takes place in neighborhoods without sewer systems and along polluted rivers. The intensive use of artificial fertilizers and pesticides also leads to contamination of the first layer of subsurface waters and hence also to the pollution of surface waters, because for a long period of time during the year they are increased by ground waters from this layer.

At the scientific and technical conference entitled "The Application of Fertilizers and Water Eutrophication," which the Polish Academy of Sciences set up in Zielona Gora in May of this year, results of research on the seeping of artificial fertilizers into the ground and surface waters thus producing the phenomenon known as eutrophication were presented. In order for eutrophication to take place there must be a phosphorous content of more than 0.01 milligrams per liter, a nitrogen content of more than 0.3 milligrams per liter, and flow of less than 0.1 meters per second. These conditions are met for over 90 percent of our lakes. This phosphorous content, which comes from the application of fertilizers, laundry products, and soil erosion, is the decisive factor in the occurrence of eutrophication.

What is the effect of eutrophication on the flora and fisheries of the lakes? Riverbanks are overgrown with reeds and cattails. Plankton shows rampant development in the water. Gradually fish which require oxygen (lavaret, European whitefish, perch, sturgeon, salmon, and pike) die, and the less valuable types of fish (roach, bream, krab, and wzdega) begin to develop. For example, in 1911, 30-40 sturgeon were taken out of the Varta. In the period between the wars, several were caught each year. After the war, the last one was caught, in 1950. Only four lakes in Wielkopolska have lavaret. The eel is disappearing from most of the large rivers. Five or six tons of certa per year were caught on the Notec 5 years ago. Now no fish of this species are.

The Question of Nationwide Air Pollution

Up until now the problem of air pollution has occurred on about 15-20 percent of the area of the country. The greatest danger is found in 35 regions of the country located mainly around large industrial centers. Pollution balance-sheets are being worked out for plants located in these regions. They cover about 50-60 percent of all the country's pollution emissions. In many localities and around factories the standards established for pollution concentrations are exceeded. Their main sources are industry, transportation, and heating.

On the national scale, industrial air pollution emissions are estimated at 3 million tons of gas (carbon dioxide excluded) in 1975. Sulfur dioxide represents 70 percent, or 2.1 million tons, and another 2.2 million tons consists of dusts, including toxic substances (for example, compounds of heavy metals). Fly-ash makes up the greatest quantity, 1.3 million tons.

The precipitation of dust in many towns exceeds the permissible standard of 250 tons per square kilometer per year, and in certain measurement points located near chimneys amounts of even several times this figure have been recorded. The concentration of sulfur dioxide in certain points of many towns (Krakow and Katowice, for example) exceeds 0.35 milligrams per cubic meter, the maximum permitted, during the heating season under adverse atmospheric conditions. The situation in the Upper Silesian Industrial District is now critical, making it practically impossible to expand heavy industry any further in this region without at the same time reducing pollution emissions from the existing sources.

Dust pollution emissions from the "balance-sheet" of 371 plants in 1971 were at a level of 1.2 million tons, and at the end of 1975 the estimate is 1.9 million tons, with a simultaneous substantial increase in industrial production within the country. The most heavily polluted voivodships are Katowice, Krakow, Wroclaw, Opole, Warsaw, and Poznan Voivodships. The greatest decline in dust emissions after the 1971-1975 plan had been accomplished took place in the voivodships with heavy emissions. Compared to 1970, these are the figures for reductions in emissions: about 25 percent in Katowice Voivodship, about 27 percent in Krakow Voivodship, and about 20 percent in Wroclaw Voivodship. In certain voivodships, Szczecin Voivodship, for example, this pollution increased. In the chemical industry this pollution amounted to 241,000 tons in 1975, that is, about 12.6 percent of the total such emissions in the country. By the year 1980 this amount will increase insignificantly, to only 268,000 tons, or by about 10 percent. Following are the shares which the various associations of the chemical industry contributed to pollution emission: Petrochemia -- 63 percent, Nieorganika -- 11 percent, Chemitex -- 10 percent, and the other seven associations altogether -- 16 percent.

As has been mentioned, the emission of toxic gases is estimated to have been 3 million tons in 1975. In relation to 1974 this is an increase of about 81,000 tons. An analysis of the plan shows that the increasing consumption of fuels, especially coal, has a fundamental influence and tends to increase the overall amounts of gas pollution emissions. Besides sulfur dioxide, whose influence and occurrence are already regional in scope, carbon monoxide, compounds of zinc and lead, copper, fluorine, nitrogen, chlorine, and carbon disulfide, sulfuric acid, hydrocarbons, and others also play an important role in pollution of the air, soils, and living organisms. In the future we should expect to see more pollution caused by the development of the automotive industry. Even today a substantial amount is noted at many points were communication routes cross in large towns. In the Upper Silesian Industrial District and on land nearby a substantial decline in solar radiation is being recorded as the result of air pollution. For the whole solar spectrum the decline in radiation amounts to a dozen and some percent and for ultraviolet rays, about 30 percent.

In 1975 gas emissions in the chemical industry totalled 547,000 tons, that is, 18 percent of the total amount of the country's emissions of gases, and 30 percent of the amount recorded. The various industrial associations had the following percentages of the total amount, which equals 100 percent: Petrochemia -- 55 percent, Chemitex and Nieorganika -- 12 percent each, Organika and Erg -- about 5 percent each, and the other five industrial associations -- 23 percent altogether. Among the harmful gases which the domestic chemical industry put into the air we can name the following: sulfur dioxide (48 percent), carbon monoxide (16 percent), hydrocarbons (16 percent), nitric and nitrous oxides (7 percent), and the rest (29 percent) consisted of sulfuric acid, hydrogen sulfide, carbon disulfide, fluoride compounds, and others.

Design and Investment Activity in the Chemical Industry

The Biprowod Water and Sewage Management Research and Design Office of the chemical industry was created on 1 January 1960, by virtue of a directive of the minister of the chemical industry. By the end of 1960 the office had 73 employees and had completed projects for the following waste-water treatment facilities: for the Mazowieckie Refining and Petrochemical Works in Plock, for the Pulawy Nitrogen Plant, for the Zloty Stok Mining-Chemical Plants (Butanol Department), and for the Pronit Plastics Plant in Pionki. In 1968 Biprowod had added to it the Department of the Man-Made Fibers Project Office in Szczecin, in order to specialize in air pollution. This department was made independent at the decision of the minister of the chemical industry in the middle of 1973, and it took the name Proat Air Pollution Control Design Office. The Biprowod design office currently has nearly 600 employees, including more than 300 in Warsaw Voivodship, with the rest in field units and departments in Zabrze, Wroclaw, Gdansk, Pulawy, and Rzeszow.

In 1975 the sales value of Biprowod reached 113 million zlotys, and work productivity has increased from 189,500 zlotys per employee in 1975 to 215,400 zlotys during the first half of 1976 (annual rate). The Biprowod project office's contribution during the past 16 years is the completion of 20 treatment plants, and another 18 currently under construction will be put into service in 1977-1978. The total capacity of these treatment plants is 1.7 million cubic meters per day, which corresponds to a city of 5 million. The office recently began to draft documentation for the biological part of a treatment plant on the right bank in Warsaw. The worsening condition of Polish rivers and lakes requires effective preventive action, through both new investments and increased technological discipline on the part of the industrial plants. This latter task is to be furthered by a new water law which was promulgated this year. The law introduces a fee for water and for the discharge of waste water (DZIENNIK USTAW, No 41, dated 13 December 1975). On the other hand, investment activity in the ministry of the chemical industry should be made equal to activity throughout the national economy.

Throughout the economy 26 billion zlotys was spent on the treatment of waste-water from 1961 to 1975, and 13.3 billion was spent during the five-year period from 1970 to 1975. For the years 1976-1980 the investment plan which MAGTOS proposed at the beginning of this years calls for 26 billion zlotys, that is, twice the amount of the past five-year period. The next five-year period will be a period of water-treatment plant modernization. In the chemical industry expenditures on the water economy and sewage management amounted to 5.2 billion zlotys in 1971-1975. This is 4.1 percent of total investment outlays. The expenditures are to be increased only by a negligible amount in 1976-1980, by 19 percent to a total of 6.2 billion zlotys. The postulates of the First National Conference of Environmental Protection Specialists of the Chemical Industry, which was held in Szczecin on 31 March and 1 April 1976, point up the need to increase these outlays to 9.5 billion zlotys, that is, by 80 percent more than during the past five-year period. In addition, during the course of the above-mentioned meeting, there was a call for the expenditure of 9.0 billion zlotys for air pollution control and of 2.5 billion zlotys for solid waste management.

Summing up, the data presented show that the chemical industry is trying by 1980 to bring about a reduction in the plants' effect on the natural environment and to achieve a condition of harmonious coexistence between industry and the environment.

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SERBIA OUTLINES RESEARCH PROGRAM FOR ENVIRONMENTAL PROTECTION

Belgrade EKONOMSKA POLITIKA in Serbo-Croatian 1 May 77 p 36

[Excerpts] The soon to be signed self-management agreement on scientific research work in the area of protecting and developing nature and the environment regulates questions of organizing, planning, financing, and using the results of research in this field [in the Republic of Serbia]. These questions are of mutual interest to the signers, namely: the Executive Council of the Serbian Assembly, the Republic Association for Science, as well as other republic associations, the Republic Water Fund, the United Electric Power Enterprises of Serbia, and the "Put" Associated Enterprise for Roads.

The program for scientific research work in this field in Serbia plans for long-term research in 6 basic fields (with 21 subject areas). These fields are: social and techno-economic problems, institutional-legal problems, water, air, land and eco-systems, and food. The long-term republic program in these areas is divided into two stages: the first stage should be completed by November of this year, and will require a total of 30 million dinars, while 30 to 50 million dinars will be required for each following year. The Serbian Executive Council and the Republic Association for Science will provide 45 percent of the finds, while the signers of the agreement, depending on interest and need, would provide the remainder.

CSO: 2800

DR LAH DESCRIBES ANTIPOLLUTION MEASURES

Maribor VECER in Slovenian 4 Feb 77 p 4

[Interview With Dr Avgustin Lah, president of the Slovenian Republic Environmental Protection Committee, by correspondent Braco Zavrnik]

[Text] The Assembly of the Socialist Federal Republic of Yugoslavia proclaimed the current year "environmental protection year." This gesture, on the one hand, draws attention to the fact that our environment is seriously endangered and, on the other hand, shows that we are determined to preserve or improve our environment and bring it to a level where healthy and undisturbed life is possible. We interviewed Dr Avgustin Lah, vice president of the Executive Council of the Socialist Republic of Slovenia and president of the republic's Environmental Protection Committee on what has been done so far in Slovenia for environmental protection, what is being done, and what will have to be done in the future.

[Question] Comrade President, what is your assessment of the present situation with respect to perfection of legal regulations on protection and improvement of environmental quality? Can we be satisfied with the laws and regulations adopted thus far or are there still other things that should be done to cope with the situation?

[Answer] First we must observe that there are a great many regulations on the books. These were published by the committee in a voluminous double issue of the review NASE OKOLJE. Regulation of waste and noxious substances is still open. However, proposal to adopt legislation to cover this area and the basic premises from which it should proceed has already been sent by the [Federal] Executive Council to the Assembly of the People's Republic Slovenia for review.

Upon examination of all the regulations it can be seen that they were evolving gradually over the last decade in which undesirable effects of our activities on the environment were piling up. For this reason the regulations, especially in specifying the sanctions, are not uniformly strict. Moreover, some enforcement rules have still not been promulgated which impedes the application of the statutes.

The republic penal code is currently being revised. The draft which has already been submitted to the Assembly of the Socialist Republic of Slovenia provides for uniform treatment of offenses and the imposing of sanctions in the area of public safety and environmental protection. A corresponding assignment has been submitted to the investigating community.

Dangerous Exceptions

[Question] Our environmental situation continues to deteriorate. This includes even the areas where appropriate statutory provisions for environmental protection, including the sanctions, already exist. What is the reason for this in your opinion?

[Answer] Concerning the environmental quality, incidents, and problems associated with it, we must observe that the working people's awareness of society's concern for healthy living and working conditions has grown considerably in recent years. There is increasingly more observation and professional recording of the environmental phenomena. We are taking a more critical look at the problems which we used to overlook in one way or another before.

In essence, we do not find that the environmental situation is growing worse at the present time. Of course, there always are exceptions and some heavy pollution and poisoning of the rivers are very disturbing. However, the deterioration of the environment has been arrested in many instances and there are increasingly more examples of successful solutions where pollution has been stopped or reduced starting with the Maribor Livarne [foundry] pollution of the Reka River in Notranjsko.

There are plenty of statutes but not enough regulations although quite a few have been promulgated. However, these statutes and regulations must be implemented by action and practical solutions in the organizations of associated labor, local and interest communities, procedural manuals of professional service organizations, urban planning and allotment of space. This part of regulatory work has not been completed, and it is here that serious difficulties exist, because of which negligence is not being prevented. The organizers of operations should take professional interest in this, while the self-management authorities should be involved on behalf of the general interest of society, ranging from the regulation of working relationships to purely economic aspects. Unfortunately, we find that statutory regulations covering the intermediate range by and large are also deficient in this respect and, moreover, no social agreements for their implementation have been concluded.

At present the republic's Secretary of Industry will issue instructions on the required procedures for preparation of reports and evaluations for all new construction or modification of existing projects. Timely assurance that no new sources of pollution will be created and that in all changes only non-polluting technology is being introduced holds forth the prospect of gradual but certain improvement and satisfactory control of the environment.

Threat to Ecological Balance

[Question] Destruction of the environment not only causes great harm to the so-called ecological balance but also substantial economic damage. Is the latter given adequate consideration in the efforts for environmental protection and does it indicate a different approach to this problem than has hitherto been in use?

[Answer] The environmental protection is justified in its concern for the life and work of the people. Observation that man is our most precious resource cannot remain an empty platitude. It was for the advancement of its own interests that the working class supported by other working strata, fought for and won the control of the government, brought about a revolution, and developed self-management based on the socialist principles.

Man lives by the fruits of his labor, which is to say that he needs food and other goods, clean water, clean air, ability to move around, and daily replenishment of his physical and mental capabilities for continuing the next day's work. We cannot give up these requirements. Under less favorable conditions our productivity tends to decrease. We all work to survive and to live as well as possible. This is why we bring up new generations, carry out the search for natural resources and new opportunities, and seek the best methods of production and subsistence.

Where are our greatest economic losses? Primarily in the building up of fertile farmland. Slovenia produces 85 percent of the food it needs, and we should bear in mind that for the sake of the general interest as well as for reasons of self-sufficiency we are responsible for each square meter of agricultural land.

Several countries in the world are buying food. All industrial countries endeavor to optimize their agriculture. We must expect that in a critical situation chemicals, fuel, machinery, and personnel could become scarce and it may become necessary to plant and harvest on every piece of land.

Expensive Waste

Moreover, we are losing a great deal because of waste. We burn and destroy a lot of waste that could be used as raw material. Each ton of paper means a loss of a given number of trees. We pay large amounts of foreign currency, tens of millions of dollars earned by hard work and skill, for scrap iron and rags imported from abroad. With every liter of waste we pollute 300 liters of running water, which is none too abundant, especially not in the time of drought.

Uneconomical use of energy and excessive heating of rooms wastes coal that was dug up by hard labor or other forms of expensive energy, and, moreover, the efficiency of people working decreases in overheated rooms.

This is why we advocate planned collection of waste, systematic exploration of natural resources, development of appropriate technology and, especially, planned siting of activities with respect to their environmental impact. Some of these objectives--for example, cooperation of industry in utilizing waste and introducing new technology--can be readily accomplished. All these objectives, however, represent permanent long-range goals which will be gradually implemented.

In our republic we are confronted with some acute problems of environmental destruction which can be solved only through cooperation between the republics or on the international scale. What has the committee done so far for cleaning the Sava River and for the protection of the Adriatic Sea off the coast of the Slovenian People's Republic? Cooperation between the republics is carried on in several ways. Our cooperation with the neighboring republic, at least along administrative lines in the area of urban planning and elsewhere, is good. In the domain of energy resources, too, we are carrying on discussions of mutual interests so that the responsibilities of each party could be more rationally defined. Cooperation also exists between various organizations such as, for instance, between the Lendava Oil and Gas Refinery with the Croatian INA.

Attached to the Federal Executive Council is the Council for Environmental Protection and Space Planning that coordinates the positions of all republics and autonomous regions. Problems also are approached in other ways. With this I do not mean to say that everything has already been resolved. We are, however, solving our common problems by joint planning and the like.

Effort To Clean the Rivers

We wish to clean the Sava River. A good example in the most critical part of its flow has been provided by the cellulose and paper mill Djuro Salaj at Krsko. By introduction of new technology the waste that was previously dumped into the Sava River is now used as an energy resource. The plant's production has increased while the pollution was markedly reduced. It would be well if others, too, followed their example.

The effluent from the coal mining region's flotation plant will cease to flow into the Sava River when another thermoelectric power plant is completed. All the leftover coal will then be burned at that plant, the flotation will no longer be needed, and the pollutants will be discharged through the newly built high smokestack.

For the present it is necessary to make every effort to clean up the Savinja River and its affluents from Mozirje and Velenje to Store, Celje, and beyond. There are a hundred reasons for this, otherwise the Savinja River valley and the Celje basin will sustain irreparable deterioration. What is at stake and must be saved are the cities and health resorts along this river and the Sava River. All the working collectives are expected to make an earnest attempt at solving this problem by pooling their skills and resources. In addition the Sava River and all the springs flowing into the Sava River from Jesenice to Moste must be saved.

As a matter of fact it is necessary to say the following: At present the level of industrial and urban pollution is so high as if three times more people were living in Slovenia, that is, over 7 million. Most of this pollution is caused by some 20 industrial organizations in the fields of paper and cellulose processing, chemical, textile and leather industry. It is in this area where the greatest pressure for compliance must be applied. It is necessary, however, that realistic target dates be set and that agreements on the necessary arrangements be reached. The same applies for our part of the Adriatic: This is a tranquil sea which we wish to transform into a high density zone of maritime economy. Both goals can be attained only by universal agreement and strict observance of the principles and measures of environmental protection and rational use of space in the distribution of economic activities. We must persevere in our planning and negotiations. Construction of a refinery and chemical industry is in preparation. We should realize that nonpolluting technology requires a 26 percent higher investment. This must be taken into the account at the economic calculations and decision making.

Importance of Planning and Agreements

[Question] The need for environmental planning has been viewed by many as a matter that could be shunted to a side track. Do you feel that the state of our environment changed such thinking, in other words, are we treating environmental protection as a matter of universal social concern of equal importance to some other interests?

[Answer] We have already indicated the importance of planning, coordination, distribution and cooperation of the various entities by our previous agreements. No activity is an end in itself by which I mean without influence on the environment and, conversely, the natural and social environment influences every activity.

The following holds true concerning the establishing of self-management interest community is already in operation and they are bound by the air resources protection law to establish, in the endangered areas Nos 3 and 4, a community for protection against air pollution, these are merely action and coordinating groups for coordinating the programs, and their implementation, of the interested responsible parties of the area.

Water resources groups already have a more in-depth character and more immediate large scale assignments. This, however, does not absolve other factors in the area from their responsibility to take steps that their environmental impact will not be harmful and dangerous to others. The interest communities, no matter how active they may be, cannot replace the self-management factors in associated labor or local communities and opstinas--all these entities must come into play, and it is appropriate that they work together in the spirit of friendly cooperation and solve one problem after another.

Also important is social organization which has its basis in the socialist alliance. The solving of environmental problems has several aspects:

the specific professional planning, technological feasibility, functional purpose and architectural compatibility with the surroundings. The socio-economic aspect enters because the problems are solved through the pooling of resources and according to a plan, the political because of the people's interests, and the cultural because of the need to protect our cultural heritage and promote culture in the development of our standard of living and social life.

All this is most effectively coordinated in the Socialist Alliance of Working People [SAWP] from where the agreements and assignments proceed to their common goal. Also cooperating within the SAWP are social organizations--communities for environmental protection, professional physical education, educational and other activities. Only in this way we can find out what "the universal social interest" is so that we may all give it our support.

And another thing concerning environmental protection: Energy resources, transportation, industrial and other activities and policy should be coordinated with agreements and the policy on the protection of man, natural and social resources, and the entire environment. In this way we shall be able to succeed in making progress and solve most of the environmental problems through planning in advance.

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CSO: 5000

POLLUTION FROM COPPER REFINERY DESTROYS CROPS

Lima EL COMERCIO in Spanish 18 Apr 77 p 3

[Text] The fumes expelled by the Ilo copper refinery plant cause serious problems in the agriculture of the zone which is almost completely restricted to olive groves.

This situation has the farmers seriously worried, and they hope that the commission named to study this grave problem will effect the recommendations pertinent to the solution of this situation.

The sulfuric anhydrite expelled by the Southern Peru Copper Corporation's Ilo refinery causes serious damage to the olive groves by retarding production of table and oil olives.

Presently, 450 hectares of olive trees and various other farm products are cultivated in Ilo Province. The area is divided amongst countless farms. There is not a single farm where the effects of the toxic fumes is not felt.

"It is paradoxical, but the fumes seem to prefer the especially fruitful trees with unseen preference, and not the generally less productive ones," said several Ilo farmers.

It is also appropriate to indicate that the olive tree is a plant singularly resistent to environmental inclemencies; nevertheless, it is sensitive to the fumes emitted by the cited plant. -

It is easy to suppose, then, that weaker plant species such as farm products are practically defenseless against these toxic fumes.

On the other hand, studies are in progress to purify these fumes and make them less toxic, although nothing concrete has been accomplished as yet.

A Front Against Pests

A front of farmers has also been formed in Ilo to fight crop pests.

An agreement has been established between the producers and the Ministry of Agriculture to set up a center for raising beneficial insects for pest control.

The farmers agree to pay 15 soles for each protected tree. It is estimated that 300,000 soles can be collected to proceed with construction of the insect center.

9038
CSO: 3010

POLLUTION THREATENS WILDLIFE IN RUWENZORI NATIONAL PARK

Salisbury THE RHODESIA HERALD in English 25 May 77 p 9

/Text/

WHAT remains of the wildlife in Uganda's once famous Queen Elizabeth National Park — now the Ruwenzori National Park — is threatened with extinction by pollution, according to conservationists here.

The park, some 2 000 km² of lush pasture and forest in western Uganda near the foothills of the Mountains of the Moon, is about to be inflicted with a vast, modern salt factory.

Built in the park on Idi Amin's orders, the factory chimneys will pump out dense smoke while the factory itself is expected to emit large quantities of polluted water into the park's ecosystem.

Sited near the factory, which will come into production soon, is the Uganda Institute of Ecology, the researchers of which have waged a campaign to trigger off world indignation at the threat to the park.

Ten years ago the park had a heavy population of elephant, but most have already been killed for meat and ivory by President Amin's armed forces.

The conservationists' last indignation wave rippled round the world five years ago when it was reported that Amin's soldiers were killing the park's elephant by "baiting" them with troughs of poisoned bananas.

Much of the park's boundary runs along the former Lake Edward, now renamed Lake Idi Amin Dada.

Scientists fear the factory effluent will find its way into the lake to threaten the large hippo population.

Ornithologists have already reported that the factory will threaten the park's bird life.

CSO: 5000

MONITORING THE QUALITY OF MOSCOW'S AIR

Moscow MOSKOVSKAYA PRAVDA in Russian 5 Apr 77 p 3

[Article by T. Novikova]

[Text] The Ostankino television tower is so narrow in its high-altitude section that when climbing up the inside stairs one's back leans against its rear wall. Here at the 503-meter level is the observation platform of the Central High-Altitude Hydrometeorological Observatory which is the farthest from the earth's surface. Instruments fastened to long poles make 24-hour observations and transmit data on the state of the atmosphere to the computer center in the observatory. However, one can imagine the processes occurring in the lower atmospheric layer of the capital without climbing to the highest point. From the glass viewing area to which the tourists are taken the entire lower layer of the atmosphere is presented in a sectional view with graphic clearness. Overhead, from above is the clear blue sky. A little lower is a grayish layer of haze. When the sun rays encounter it they are dispersed. From the earth they seem to be dissolved in a white haze.

"The air in Moscow today is much cleaner than in Washington, New York, Tokyo and many other large cities in the world," relates A. S. Britayev, head of the observatory and candidate of physico-mathematical sciences.

"Although in recent years the number of cars in the capital has increased considerably, the volume of industrial production and its pollution of the atmosphere has not."

Even a single listing of the measures taken to preserve the freshness of Moscow's air basin is impressive. It is enough to recall that in recent years many enterprises which polluted the environment were moved beyond the city limits. Other factories and plants were equipped with special purifying facilities. Planting areas grew. A major role was played by the rebuilding of the capital's highways which were widened and straightened, thus providing free movement of traffic. Cars have been designed which operate on gas fuel. Monitoring of the state of the environment has been perfected.

Britayev shows me the graphs illustrating the level of the air condition in Moscow. At the end of each month, information on the atmosphere in all the regions of the capital is summarized. Specialists of various professions are interested in these data, from workers in industrial enterprises and the sanitary-epidemiological services who, in accordance with them, monitor the level of industrial discharges into the atmosphere, to physicians who use the precise characteristics of air purity to adjust the regimen of patients. Pollution of the lower atmospheric level in the same regions of the city can, in fact, increase several times from a change in the humidity, solar radiation, wind strength and other factors.

"Observations of the air in Moscow are made by 30 continually operating stations located in all regions of Moscow," relates A. S. Britayev.

"Work has now begun to create a single automated system for observation of air pollution. The first laboratories of the new system 'Post-1' have already appeared on the streets of the city. So far there are a total of 10 of them and the indices from transmitters, instruments for collecting air samples and miniature weather bureaus must be sent to Ostankino 'by hand.' In several years when the system will be completed there will be dozens of these stations in Moscow and their information will be automatically transmitted by electronic computer. This system will permit us to increase the volume of information by several hundred times and to gather it constantly. And this, in turn, will help to make a more accurate 'diagnosis' of the condition of the environment."

The computer center is the heart of the observatory. Work does not stop here for a minute. At the order of the electronic computer the tape recorders and teletypes record the gathered information. Here one can obtain an especially graphic picture of the enormous volume of work of the Central Hydrometeorological Observatory and the comprehensiveness of its tasks. It has only been a short time since trucks were not allowed to drive on the central highways of the capital. How did this measure affect air purity? A prompt answer should be given as soon as possible.

But the majority of observations which are made in the laboratories of the main observatory building in Ostankino last for several years. This permits the determination of the laws governing phenomena. Here for the first time in our country systematic studies have begun on "photochemical smog" which is formed as a result of hot sun rays acting on the products of automobile exhaust. Los Angeles and the southern cities of Japan suffer from this malady. And although Moscow, which is located in the more northern latitudes, is not yet threatened by this danger, this phenomenon has become the object of intensive research.

"At the same time, methods are being developed in the laboratory for more lengthy monitoring of atmospheric pollution. I believe that in the future the forecast of air purity will occupy the same legitimate place in our

life as the weather forecast," smiles Britayev. "We can already make a rough 'forecast' of air pollution for 1-3 days ahead. Besides meteorological data one must, therefore, take into consideration a change in discharges into the atmosphere by Moscow enterprises. These data are already being analyzed. In addition, attention must be focused on irregularity of traffic flow and in the case of a vast fleet of private automobiles, even the psychology of the drivers. As you see, it is not an easy task. But in principle it is feasible."

...A place was even found for me in the van of the Moscow clean air service together with the head of the laboratory for observations of air pollution in the city, R. I. Cherdantseva. Leaving Ostankino behind, our UAZ-452 rushes to the Malaya Kolkhoznaya square. We stop in the courtyard. Not long ago there appeared here one of the metallic silver houses of the hydrometeorological service "Post-1," the first of the future automated monitoring service. There is little work. It is enough to take from the instruments tapes with running recordings of information. Before setting out from here for the laboratory we still take in an ordinary volleyball box several dozen cubic centimeters of the local air for sampling.

9035
CSO: 5000

ENVIRONMENTAL PROTECTION MEASURES FOR BLACK, AZOV SEAS

Moscow SOVETSKAYA ROSSIYA in Russian 30 Mar 77 p 4

[Text] The RSFSR Committee of People's Control verified how the decree of the CPSU CC and the USSR Council of Ministers on preventing pollution of the basins of the Black and Azov Seas is being implemented in the Belgorodskaya Oblast.

The check showed that in the oblast specific work is underway to end disposal of untreated sewage into the basins of the Black and Azov Seas. The sanitary conditions of the Northern Donets River has improved somewhat in comparison with 1975. Water conservation measures have been developed and affirmed for 22 projects where construction is planned for 1976-1980.

However, untreated sewage is still being dumped into the rivers of the oblast. The heads of individual industrial enterprises and construction organizations have not paid enough attention to accelerating construction and improving the use of water conservation projects. Last year the investment plan for water conservation measures was 94.3 percent fulfilled.

The "Belgorodstroy" trust of the USSR Mintyazhstroy [Ministry of Construction of Heavy Industry Enterprises] began work on treatment facilities in Belgorod in March 1971. Construction was slow and of poor quality. The actual duration of the construction exceeded the normal by more than twice. The project was accepted with the rating "good," although the treatment facilities were put into operation in December 1976 with substantial imperfections. The municipal production administration of the water and sewage economy did not prepare facilities for operation and staffed them only with 50 percent of the attendants. Therefore, biological treatment of sewage is not properly provided. Construction of a sewer has been underway for over 3 years at the Starooskol'sk Cannery of the "Roskonservprom" association of the RSFSR Minpishcheprom [Ministry of Food Industry]. At the end of last year it was also put into operation with the rating "good," but as yet the sewer has not been connected to the municipal treatment facilities and is not being used due to the large volume of unfinished work.

It was found during the check that the "Soyuzruda" association of the USSR Minchermet [Ministry of Ferrous Metallurgy] is not taking the necessary measures to expand treatment facilities in the Lebedinsk mine of the "KMAruda" combine. The ministry did not ensure the timely formulation of technical documents and did not plan financing for this project for 1977.

Measures are slowly being taken to end disposal of untreated sewage at the Belgorod Vitamin Plant of the "Soyuzvitaminy" association of the Minmedprom [Ministry of Medical Industry]. Local treatment facilities in the combine have been in operation since June 1976, but they have not yet been accepted by the state reception commission due to the large number of imperfections. Operation of the working filter beds is unsatisfactory; treatment of industrial run-off does not meet sanitary requirements.

A check of 10 enterprises of the sugar industry showed that the "Rossakharprom" association of the RSFSR Minpishcheprom also does not focus enough attention on construction of water conservation facilities in the oblast' and does not stop in time gross violations of the state discipline which are permitted when the facilities are again put into operation.

Members of the state reception commissions from the sanitary-epidemiological stations and water conservation organizations in the oblast sign reception documents in violation of the prevailing standards and rules, thereby disregarding the proper requirements and principles.

F. M. Lesnykh, head of the Belgorodskaya Oblast administration of water and sewage economy, was reprimanded by the Committee of People's Control for accepting treatment facilities into operation with imperfections and defects.

K. F. Luk'yanov, deputy general director of the Belgorod production association of the canning industry, RSFSR Minpishcheprom, was severely reprimanded for accepting into operation an incompletely built sewer in the Starooskol'sk Cannery and for altering the state accounts.

V. N. Teodorovich, head of the "Rossakharprom" association of the RSRSR Minpischeprom, was reproved for permitting uncontrolled construction of water conservation facilities.

The committee required the RSFSR Minvodkhoz [Ministry of Water Management] to strengthen control over fulfillment of the party and government directions on protecting the basins of the Black and Azov Seas from pollution.

It was suggested that the Belgorodskaya Oblast committee increase its control over the construction and putting into operation of the water conservation projects in the established periods.

9035
CSO: 5000

ENVIRONMENTAL PROTECTION MEASURES IN SVERDLOVSKAYA OBLAST

Moscow TRUD in Russian 10 Apr 77 p 3

[Article by A. Borisov, chairman of the Sverdlovskaya Oblast Soviet of Workers' Deputies ispolkom: "Ural Waters Are Clearing"]

[Text] Nature has generously endowed the Urals with her bounty--it is not without reason that it has become a region of well-developed industry. But, while building its power, Ural industry has increasingly come into conflict with nature. The reasons are obvious. Plants that were built during the years of the first five-year plans, those that came to the Urals during the Patriotic War as well as postwar enterprises bear the mark of time in that the majority of them were not provided with any sort of equipment to purify the toxic emissions of industry. No authority extended to this at the time.

Nowadays, there are many enterprises whose operation has an effect on the environment. The problem lies in the fact that it is mandatory not only to solve the diverse aspects of protecting the environment in this day and age, but also to repay the "debts" built up over the decades.

Active work has begun following the adoption of a law on environmental protection. A great deal has been accomplished in 15 years. Given our limited water resources, it is especially important that enterprises "drink" less and less from Ural rivers. More than half are operating with closed water-recirculating cycles, and, during the Tenth Five-Year Plan, the amount of water in recycling and recirculating systems will increase by half as much again.

That our rivers are becoming cleaner is a second comforting fact. It is difficult to imagine today, but it was true that the larger plants of Pervoural'sk, Revda and Polevskoy once poured tons of noxious effluent into the Chusovaya every day. Now, industrial wastes do not enter the river untreated. For several decades, there was no life in the murky waters of the Tagil. But now, pike, burbot and perch are spawning there again.

After the war, a new plant appeared in the city of metallurgists. By Ural standards, it was not even a plant but a shop. The prospects for its production were then considered slight, but the damage was felt not only by the residents of the Tagil area, but also by those of Tyumen'; even in Tura, 20 miles away, the concentration of phenol given off by the plant exceeded accepted norms by several times.

The enterprise grew and became the largest plastics plant in its industrial field. But, pollution of the water reservoir was the spoonful of tar that counteracts all the useful work.

Following enactment of a law on environmental protection, chemists became seriously involved in the problem of treating waste water and undertook to establish a series of biological purification works. Major expenditures of about 5 million rubles were required. In return, when the complex went into operation, sewage from not only that plant, but also from the entire Dzerzhinsk region of Nizhniy Tagil was being treated (this being prior to fresh river water conditions).

It would appear that even the most aggressive industry in relation to the environment cannot only be rendered totally harmless, but can even become useful to nature.

What is needed for this? "Money," the directors of enterprises would say, and they would be correct.. Of course, capital resources are necessary. But, in the main, what is needed to solve the problem first is that every director must understand that the issues of environmental protection are no longer in second place; they are of top priority. We must overcome the inertia of the past relationship to the environment. Resources, incidentally, depend on this to a great extent since money does not fall from the sky--it, too, is allocated by people.

Unfortunately, there are still some managers who continue to live in the past. This, as it were, often impedes the solution of conservation problems, even when there is no lack of capital funds.

According to the plan of the oblispolkom, treatment facilities in Irbit which are critical to the city, should be in operation this year. However, the completion date is threatened by delays: equipment worth 250,000 rubles is lacking in the construction. Many of the nation's enterprises are engaged in the manufacture of equipment and the majority of them have persistently delayed delivery of the finished goods to the Ministry of Housing and Municipal Services. It is obvious that these orders have been placed in secondary categories at the manufacturing enterprises until now.

The problems of protecting the atmosphere are very difficult to solve. During the Ninth Five-Year Plan, 69 million rubles were expended on these measures (almost three times more than in the previous 5 years). About 300 dust filters and gas treatment facilities have been put into operation (a two-fold increase).

The total figures are good so long as they are total. But, they must be expanded, and it immediately becomes obvious that the contribution of various enterprises, departments and ministries to the effect is far from equal. Some are working actively while others are patently inadequate. Among the latter are enterprises of the ferrous and nonferrous metallurgy industries, the cellulose-paper and chemical industries.

During the past five-year plan, the RSFSR Council of Ministers instructed the management of the Nizhnetagil metallurgical combine to equip nine open-hearth furnaces with gas-purifying facilities. Only four were completed and work was stopped. And yet, the USSR Ministry of Ferrous Metallurgy and the technical inspection of labor are patiently listening to a discourse from the combine's management on the difficulty of assembling the treatment equipment....

A very effective means for solving the problem is well-known: emissionless technology and the elimination of any discharge into the atmosphere and water reservoirs. It is clear that, within the conditions of existing industry, the older the technological process, the more difficult it will be to alter it and sometimes it will be impossible. But we can, and we must, strive for this.

At the Uralasbest combine, this problem is being solved through the process of reconstruction. Asbestos dust was previously discharged into the air by the ton. Now, warm air which is used to clean the dust is not discharged outside but is used in the production process.

What constitutes progressive technology, a progressive industrial process? The factors defining these concepts are many. They must contribute to the output of modern production, they must promote the growth of labor productivity, and they must be economically effective.... But one requirement should remain immutable and progressive only in the sense that it serves the "interests" of the environment and causes no harm.

Timber is a great asset of the Urals, our pride, and our responsibility. From an economic point of view, this is a huge reserve of raw material. It is inexhaustible if used rationally, as the present masters are obliged to do.

More than 20 million cubic meters of wood pulp are processed in the area every year. This is a great deal. But, it will not be harmful if the timber industry is conducted knowledgeably and if the principles of proper forest exploitation and improving its productivity are observed.

Cutting over and above the estimated wood to be felled causes irreparable damage. This leads to a change in the vegetation. A coniferous forest does not have time to replace itself and the cuttings become overgrown with less valuable wood and weed trees.

And this is not the only loss of valuable raw material. The forest is no less valuable to us as a protector of the climate, as a defense against erosion and as protection against cold and scorching winds. Saving the forest in the central mountainous industrial portion of the oblast is especially important, as Mendeleyev said when he arrived in the Urals at the end of the last century. But, even here, the forest industrial service of the USSR Ministry of the Timber and Wood Processing Industry cuts more than 3.5 million cubic meters over and above the rated cutting rather than developing new major forests and systematically transferring industrial strength there.

Just follow the trail of timber agents, particularly the so-called "independent" agents (this is the self-inflicted downfall of various industries and organizations of the non-forested regions of the country). Vast piles of brushwood and shocks form avalanches in the clearings. How much ethyl alcohol, albumin, resin or fiberboard could be obtained from them! So often this raw material is not only unused--it is even treated as waste: the brushwood rots which disrupts natural biological processes and leads to pollution of the rivers.

The timber and wood processing industry should be a wastefree field. But, this need, which is defined by scientific and technological process, and which totally complies with the interests of both man and nature, is extremely slow in being realized. No more than 30 percent of the cutting residues are going on to processing.

However, it would be unfair to lay all the blame for damage to the forest exclusively on those associated with the procurement of timber. We are all tied to the forest, and saving it is necessary for the entire world.

The oblispolkom is taking steps to preserve the unique creations of nature in the Urals in all its beauty. Scores of reservations and preserves where large-scale tourism and hunting are prohibited have been organized, and 275 monuments to nature have been established (among them, for example, are the celebrated Shartashsk palisades, the larch under which Yermak spent the night in legend, the Denezhkin stone, and the cliffs of the Chusovaya River)--these are especially protected by local organs of power and society. The system of natural reservations will, of course, expand. But restricting everything is neither the only nor the primary way.

"It is necessary to teach people, and especially the young, to walk on the land! But on the living land. This is not the same as walking on lifeless asphalt." It would be impossible not to agree with the words of B. P. Kolesnikov, a great scholar and corresponding member of the USSR Academy of Sciences.

Something is being done in this direction at home in Sverdlovsk. Scholars, members of the All-Union Society of Environmental Protection, foresters, and students of local lore are giving programs at enterprises, in institutions and at schools. Special departments are being established in several

national district universities. But, these are only the seeds of the "naturalist's campaign against illiteracy" which must be organized.

The problem of preserving nature is diverse and complex. Its directions are determined in a special division for future planning of the development of the national economy of the Sverdovskaya Oblast.

It is necessary to unite all efforts and coordinate the actions of many institutions, organizations and enterprises, and to establish control over the exploitation of resources selected by the government to successfully implement the extensive program. In our view, the need to create special organs for this purpose (oblast administrations for environmental protection) has become stronger.

After all, nature is a great house in which we all must live.

9003
CSO: 5000

EKOFISH SPILL MAY AFFECT COMING ELECTIONS

Paris POLITIQUE HEBDO in French 9-15 May 77 p 33

[Interview with Paul Hofseth, director of the Department of the Environment of the University of Oslo, by Claude Boris]

[Text] By dramatizing the successful outcome of the accident which occurred at Ekofish off the coast of Norway, Phillips Petroleum officials have practically succeeded in making people forget that the oil slick covers over 5,000 square kilometers of the North Sea. With Paul Hofseth, director of the Department of the Environment of the University of Oslo and one of his country's leading ecologists, we have tried to go further and learn more than what we were complacently told by part of the press, which was prompt in reassuring the mass of public opinion.

[Question] Do you know what really happened that Friday at the time of the accident?

[Answer] Beyond the purely technical circumstances, the real cause of the accident was that the workers and technicians who were working on the valve that gave way were told to hurry. They protested, bringing about a ruckus, and took risks to gain time, which is money for the oil companies.

[Question] But it is important to know what the technical breakdowns were in order to avoid another accident.

[Answer] There has been talk about a metal piece which fell into the pipeline, a piece that could not be properly recovered. There has also been talk of a very old valve that should never have still been in place. But since Norwegian experts have long been forbidden from approaching the platform, it is to be feared that the most compromising traces or proof have been removed. Furthermore, during the duration of the operations, we were in fact totally deprived of information. We were told all kinds of things.

[Question] Can one evaluate the consequences of the accident?

[Answer] It is still difficult to do so. On Sunday, I flew over the disaster area and it is even impossible to give its precise area, which extends over thousands of square kilometers.

[Question] But it is said that the slick is disappearing.

[Answer] You know, 20,000 or 30,000 tons of oil, perhaps more, since no one measured what came out of the open valve, cannot disappear by magic. And the part no longer on the surface is between two sheets of water or on the bottom and continues to do damage. At any rate, what can fishermen do in an area where their nets are gummed up with oil?

[Question] Were chemical products used?

[Answer] Absolutely, despite the ban from Norwegian authorities. What is worse, the oilmen used substances of which they refuse to give the composition, just like they refuse to say what quantities were used for nearly a week.

[Question] What right did they have to do so?

[Answer] The same right that those people take even though they are working deposits under Norwegian jurisdiction.

[Question] What about the antislick dams?

[Answer] That is another smokescreen. They were destroyed by the waves as soon as they were erected and they cost a fortune. They were as ineffective as the boats which are supposed to pick up the oil on the surface of the water. Actually, the accident clearly showed that one can do nothing against an enormous spill and that they lied when they said the contrary.

[Question] What has been the reaction of the Norwegian people?

[Answer] They debate the question a lot and they protest. For May Day, the demonstrations against the negligence of the government were very numerous, but people do not forget that most of the parties approved of these operations. Now the parties say: "It was Phillips' fault." It is a convenient way to duck their responsibility.

[Question] Now what?

[Answer] The problem of oil, like the nuclear question, will affect the election debate that will continue until autumn.

[Question] Will the ecologists present candidates?

[Answer] We shall pose precise questions and we shall demand reassurances from everyone, from those who -- with the exception of the leftists and the radical socialists -- approved the drilling and the conditions under which the operations would take place. The fishermen, who were greatly affected and very impressed by the accident, will not be the least virulent.

[Question] But why not present "green" candidates?

[Answer] There have been some, a few years ago, in the municipality of Oslo. But too many of the ecologists who were elected were disappointing, since they were often more conservative than the representatives of the traditional parties. Some even came out for Norway's entry into the Common Market. That was enough for us.

11,464
CSO: 5000

DESTRUCTION OF COUNTRYSIDE, FUTURE OF LAPLAND AREA OUTLINED

Stockholm SVENSKA DAGBLADET in Swedish 6 Apr 77 p 3

[Article by Rolf Kjellstroem, temporary professor at Uppsala University, Ethnographic Institute: "Project 'Hjertfjellet'"]

[Text] In spite of the development of the Lule rivers for more than 50 years, the employment in Jokkmokk Municipality is threatened. New power stations do not involve any rescue in the long run, but only destroy the countryside and the culture.

Jokkmokk is a population center for which the future outlook is becoming darker and darker. It is expected that up to 1981 1100 jobs will disappear and with them an estimated 3500 people from the municipality. If the estimate is correct, Jokkmokk would thus lose approximately one-half of its present population. The municipality thus needs more jobs, and it was believed that these jobs could be found in the continued operation at Vattenfalls*. At present the plans to build a power station at Sitoatno seem to be of special interest. The municipality believes that this should be sufficient to save the labor situation for a couple of years until a more permanent industry can be located at Jokkmokk.

The development of Lilla [small] and Stora [big] Lule Rivers has been going on for more than 50 years, and these rivers, which mainly lie inside Jokkmokk Municipality, have been utilized for 12 complete power stations (13 inside Sirkas Lapp Village). Jokkmokk Municipality thus has more experience than any other in evaluating the long-range employment possibilities provided by the development of water power. But the short, devastating history of Jokkmokk in the last 50 years gives a clear message: today the municipality is poorer than it has been for a long time. Does anybody actually believe that the development of power stations can increase the municipality's possibilities for employment over the long range?

Suitable Name

The project the National Power Administration now proposes has been given the

*National Power Administration

name Tjaahkevarasj ("Hjertfjellet") after a mountain located in the area. The name probably does not mean much to most people and can therefore be said to be suitably chosen if the purpose is to try to complete the project without rousing public opinion. But the project concerns the better-known Sitojaure and Sitoatno. These now-threatened lakes drain northern and eastern Sarek. The western end of Sitojaure, with the valuable delta in upper Sitoetno, lies inside Sarek National Park, and it might seen unnecessary to discuss the possible development of the lake for this reason alone, if one did not already know about what transgressions have taken place earlier with respect to the protection of the national parks.

Probable Development

If Sitojaure is regulated, the storage capacity will be more than twice as large as the lake now, and water will flood hundreds of hectares of valuable delta land in the national park. Sitoatno downstream from Sitojaure will be drained. Furthermore, one cannot exclude the possibility that additional water will be required to fill the dam. In that case it will be a question of using the water from the Rapa River, which will result in a destruction of the Rapa delta. Some people actually consider this to be a probable development if permission is given to build Tjaahkevarasj.

Sitojaure and Sitoetno, both the lake and the river, have been placed in the highest protection classification in a government report (SOU 1976:28). This has been done because of the area's unique value for nature protection, recreation, science, culture, and reindeer management.

The fauna in the region is, for instance, very valuable. It can be mentioned that eastern Sitojaure has very important open water areas whoopers, geese, and other birds, and these are important because other open water nesting areas in the district were destroyed by power stations which were built earlier.

From a tourist point of view it is urgent that Sitojaure remain untouched. Kungsleden hiking trail goes over the eastern end of the lake (by boat), and the tourists usually use the cabin and the tent sites on the north beach of Kaskajaure for staying overnight.

Unravished rivers, lakes, forests, and mountains should be able to give Jokkmokk Municipality some income from tourism over the long range too. In recent years an increase in the interest for this type of area has been noted both inside and outside the country.

Lost Grazing Fields

With regards to the development of waterfalls in Jokkmokk Municipality it is primarily one group which suffers from this interference: the Lapps. The grazing fields have been put under water, trails have been cut off,

several fishing lakes have been damaged to such an extent that their original importance and value have been lost, and settlements have had to be moved. With regards to reindeer management the situation is that a given land area has a limited capacity. It is therefore impossible to replace calving land with money to be used to buy new reindeer. Instead the result is that some reindeer keepers have to give up their source.

First-class reindeer grazing land can be found around Sitojaure and the the adjoining lakes Rinimjauratj, Kaskajaure, and Kaabtaajaure. During springtime it is calving land, and the reindeer also graze here during long periods of the year. Building a dam would involve choking off the natural reindeer trails from Pastavagge and Suodjilandet, since the reindeer will no longer be able to use the swimming place from Nammatjudden over Sitojaakkaa and they will not be able to use the natural trails from Pastaskatje to the north side of Sitojaure either. If Sitojaure is dammed up, an unusually valuable reindeer grazing and calving area would be lost and tundra would be left.

Those living along Sitojaure naturally do not want to have their fishing destroyed. For the Lapps fishing has always played a certain and often important role and has roots going far back in their history. Probably nobody believes that future generations can be compensated with money for their fishing opportunities which are lost or strongly reduced when lakes are regulated.

Lost Homes

Another aspect has to do with the feeling of home. I remember a Lapp woman from Sirkas Lapp Village who with a great sense of loss talked about the place in the mountians where she had grown up but which had been lost in connection with a dam. She said that those who make decisions on these regulations have never understood how it feels to lose one's home. She had--in contrast to so many of us who may have been away for a long time--been deprived of any possibility for returning to her childhood environment. There are many Lapps who live around Sitojaure in the spring and fall and even in the summer.

How then does Jokkmokk labor union look at these Lapp problems? Well, apparently they do not exist at all, because in the reply from the union to the Ekstroem report with the plans reported here for Jokkmokk the Lapps are not mentioned at all.

Many Cultural Memories

The Swedish mountain landscape contains many traces of hikers and travellers from old times--and even from our times. The traces are there in various forms: as a thoroughfare, a pit for catching wild animals, Laplander's tent sites, stable area, storage area, stone circle, simple shelter, bone or horn deposit, offer site or some other cult site. These artifacts may not

be as easy to see as other artifacts in other environments, but they are there and in large numbers.

Some of these physical remains are from very recent times while others go back as far as to the Stone Age. We now know far too little to be able to definitely assign all these remains from various times to any definite ethnic group. It may, for instance, be quite possible that some phenomena have their roots in a culture other than the Lapp culture. But even if that should be the case, it is still the Lapp culture which dominates the landscape, and it is Lapp culture which has characterized the mountain landscape in historical times. It is therefore primarily the Lapps who can make a claim to and have a feeling of affinity with the mountain landscape.

From the Stone Age

Around Sitojaure the National Antiquarian Office has taken an inventory and registered a couple of hundred remains just in the area around Sitojaure. The findings date from the Stone Age. They show that people have used Sitojaure and its surroundings for thousands of years to make a living.

With its position in Lapp spring and fall country, probably few areas in the world of mountains could measure up to Sitojaure with respect to the density of cultural remains. Other equally good areas have probably been found, but they are not regulated. Sitojaure is one of the few large lakes.

Not Only Wilderness

In this connection it may be worthwhile to draw attention to an area located to the WNW of Sitojaure around the small lakes Paarajaure, Laautakjauratj, and Nierekjaure. This area is culturally connected to Sitojaure because during summertime it constitutes living areas for the Lapps who stay and have stayed around Sitojaure during the spring and fall. In this smaller area (60 square kilometers) the Nordic Museum in collaboration with the National Antiquaria Office have conducted inventories and been able to register no less than 825 cultural remains. With such rich findings it would consequently be a narrowminded point of view to consider the mountain region only as a wilderness.

As mentioned in the beginning of the article, there is a great need for jobs in Jokkmokk. One might think that Jokkmokk Municipality, which more than any other municipality has contributed to supply hydroelectric power here in this country, would also get these jobs. But let these projects then be of a nondestructive nature.

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ENVIRONMENTAL IMPACT OF TREATMENT PLANTS ON OIL INDUSTRY EXAMINED

Stockholm SVENSKA DAGBLADET in Swedish 13 Apr 77 p 24

[Article: "The Environmental Problems of the Oil Industry are to be Investigated"]

[Text] There are at least 100 different hydrocarbons in each discharge from the refineries in Bohuslen. The existing purification installation has a misleading effect since the pollution appears to be transferred from the water to the air. So far we know nothing about what long-range effects these materials have on nature.

This was established by the environmental protection unit of the county administration in Goeteborg in a second report on the monitoring of the environment in Bohuslen -- which is a unique report in this country.

"The investigation of the refinery discharge is based on a complicated analysis technique," says engineer Anders Thorslund at the environmental protection unit. The tests have been developed in Oslo, and the results now form the basis for continued discussions. A working group with representatives from industry, the county administration, and the environmental protection department will now investigate what can be done about the oil industry's environmental problems.

"The information that there are at least 100 hydrocarbons in the discharge was a surprise to me," says Anders Torslund.

"And we have not yet had time to look at what petrochemical discharge contains. We now believe that they are of at least the same magnitude.

"We are trying to determine how dangerous the materials are. The best information comes from the environmental protection authorities in the United States. An attempt was made to obtain better information together with Berol Kemi in Moelndal. The discharge water was tested with a new biological test methods, 'the Ames test,' where reactions from bacteria rapidly reveal possible mutation and carcinogenic effects. No such effects were demon-

strated in this test. But the county administration believes that those materials which cause most damage to the environment must be controlled and removed. It is not sufficient just to decrease the total amount of acid-consuming substances.

"The long-term effect in nature will be even more difficult to clarify," says Anders Torslund. "The chemical industry produces compounds faster than the biologists manage to investigate the effects of them. It involves materials which do not exist in nature and which biological life has never previously been exposed to."

When the county administration investigated how the refinery's purification plant operated, they started suspecting that the pollutants were simply transferred from the water to the air. An investigation at Esso in Stenungsund showed, for instance, a strong discharge of hydrocarbons into the air from the purification plant. And a test in Scanraff showed that the purification effect did not get worse at all in spite of the fact that the biological purification plant was shut off for some time.

"One can question whether it is reasonable to build purification plants for several million only to move the pollutants," says Anders Torslund. It is not absolutely sure either that the biological purification is the best technique.

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FISH BREEDING STATIONS MAY HELP SAVE DYING LAKES

Stockholm SVENSKA DAGBLADET in Swedish 10 Apr 77 p 5

[Text] Aneboda. In a heavy, red wooden building in the middle of the forest near Aneboda 40 kilometers north of Vexjoe in Smaaland one of the world's most modern fish breeding stations is humming along. Here they are breeding, for one thing, grass carp, the Chinese plant-eating fish, which can help to save dying lakes, especially in Sweden. If the Fisheries Administration gives its expected approval, the first large lot of fish will be released early this summer. A total of approximately 1 tonne of grass carp will be distributed over 30 overgrown lakes in various areas of the country, of which half are new projects.

Good Appetite

When the carp are released they weigh only a few hundred grams, but their appetite is enormous, and in the fall the weight may be up to a kilo. The stock of smothering water plants has then been decimated.

The idea of letting grass carp serve as guardians of the environment was hatched at the end of the 1960's at the Institute for Water and Air Preservation (IVL) in Stockholm.

The first practical tests, with fish from Poland, were started in Oesbysjoen in Djursholm in 1970. There are now specimens in the lake weighing several kilograms.

The grass carp can not breed in the natural way. Nobody knows why. In order to get them to produce milt and spawn which can be used for breeding work, the researchers must therefore inject sex hormones into the fish from the hypophysis of normal carp.

Since the grass carp tests have been so promising and many municipalities are lining up to get fish for implanting, IVL wants to become independent of import. Space is required for raising fish on a normal scale.

Advanced Research

A free chance came when the old and quite worn out fish raising installation at Aneboda was offered to IVL as a donation a couple of years ago. Here one could raise fish and at the same time conduct advanced biological research.

The Aneboda installation is completely fascinating from a fisheries and cultural history point of view.

It started in 1905-1906 when fisheries superintendent Oscar Nordqvist took the initiative to create Southern Sweden Fisheries Association and started looking for a suitable test area.

He wanted to prove that it was possible to raise fish in reservoirs both for consumption as well as for placing in lakes. It is a wonder how Nordqvist could wind up in the dark forest in Smaaland in an area of fields covered by moss and bogs near Aneboda, but it may be even stranger that he succeeded in acquiring the area by negotiating with six different owners.

Acidic Water

The water he worked with was poor in nourishment and acidic, but it was rich in humus and iron. This must have been a challenge: if it is possible to raise fish in Aneboda, yes, then it should be possible almost anywhere else. A system of dams 5 kilometers long was dug up. The unusual names of the reservoirs, such as Brittelagg, Jemfelledamm, Maddamm, etc., may indicate that Nordqvist was Finnish-Swedish. According to the newspapers 100,000 young whitefish were delivered for stocking and 41 kg of tench were delivered as food as early as 1910.

Many experiments were carried out, for instance with the alternate use of oats at the bottom of the ponds which sometimes had to rest from the fish. Plants for pasture were also raised, and at one time the fish installation kept their own cows and horses.

As a reminder of this, several hens are now cackling in a building with plastic vessels for the fish. They are now laying eggs so fast that there are eggs left over in spite of the fact that IVL has 11 researchers boarding with manager Ann-Louise Martin.

Field Test

"The expansion is now taking place gradually," says IVL's research manager Arne Jerneloev. The reservoirs, most of which are approximately as large as half a football field, provide possibilities for field tests on a scale between that of the laboratory and natural conditions. The reservoirs are filled with water in the spring, the fish are placed in them and are allowed to grow during summer, and the water is then tapped out and the fish are raked in from a net in the discharge channels.

One thing which is being studied is the effect of the acidification. The effect of all the sulfur which has been collected in last winter's snow masses can also be read off in Aneboda's ingenious water system.

Intensive lime washing of the bottom of the reservoir is the measure used at present, exactly as it has been used during earlier Aneboda eras. It is possible that the new researchers in Aneboda may gradually provide other methods.

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AGRICULTURAL COMMITTEE PROHIBITS USE OF TOXIC SPRAY

Stockholm DAGENS NYHETER in Swedish 20 Apr 77 p 32

[Test] The use of "Hormoslyr" containing dioxin will be prohibited completely. The parliamentary agricultural committee has agreed on this. The committee thereby goes further than Minister of Agriculture Anders Dahlgren (Center Party), who in a speech on Tuesday revealed that the government this spring considered proposing a prohibition against dispersing this type of "Hormoslyr" from the air.

"Hormoslyr," which is used primarily in forestry, is based on phenoxy acids, of which the most controversial 2,4,5-T contains dioxin. It is the same poison which caused the environmental catastrophe in Seveso in Italy.

In Sweden the spraying with poison has recently become of interest since it was pointed out that an unusually large number of fetal injuries occurred in "Hormoslyr"-sprayed districts in northern Vermland. An environmental group from Torsby has recently protested against the spraying both to Prime Minister Thorbjoern Felldin and to the parliamentary agricultural committee.

Spraying chemical agents from the air in forestry was prohibited in Sweden from 1972 to 1975. The prohibition was cancelled in spite of the fact that several unwieldy agencies--for one thing the social administration--and a considerable minority in Parliament were against it.

The agricultural committee is now processing a motion from Bjoern Eliasson (Center Party) and others to reintroduce the prohibition about spraying phenoxy acids from aircraft. The committee thus goes further and will completely prohibit the use of "Hormoslyr" which contains dioxins.

It was primarily the Social Democrats--headed by the previous Minister of Agriculture Svante Lundkvist--who pushed the question about total prohibition in the committee. If the preparation is dangerous in small, scattered

quantities from the air, it was believed that it must also be dangerous for those who have to handle the agent in more concentrated forms.

It was especially in consideration of worker protection that the Social Democratic minister of agriculture, Lundkvist, wanted to cancel the prohibition against spraying from aircraft in 1975.

In a speech at the Skaraborg LRF [National Farmers Association] meeting on Tuesday Minister of Agriculture Anders Dahlgren said that the government wants to introduce a prohibition against spraying from aircraft with the preparation 2,4,5-T in spite of the fact that an almost unanimous body of experts on the subject believe that any health risk cannot be demonstrated. However, he believed that politicians can not leave it completely to the experts to evaluate this type of question.

"In large groups of people there is anxiety and apprehension that the agents may have effects which the researchers have overlooked," said Dahlgren. "The technique of spraying from the air gives many people a feeling of powerlessness and thereby increases the distrust."

"I therefore believe that we cannot be satisfied now by referring to the fact that an investigation is being carried out. As long as there is uncertainty about the risk, safety should come first.

"I am aware that a prohibition against spraying with "loevsly" from aircraft involves a setback for agriculture," continued Dahlgren, who himself had been on the Southern Forest Owner's administration. "At the same time I am convinced that forestry is not served by living in opposition to a broad opinion."

"If it should turn out that the suspicions which have been raised against 2,4,5-T are well based, then the responsibility rests heavily on forestry and those who have made spraying from aircraft possible. If on the other hand it can be shown clearly that the warning signals were unjustified, it should be possible in a couple of years to carry on the discussion in a more relaxed atmosphere," said Dahlgren.

"Only the First Step"

"In any case it seems like a little progress that spraying "Homroslyr" with aircraft now will be stopped by the government, but it must only be the first step. All spraying in the forests must be stopped."

This is what DAGENS NYHETER was told by Lars Lundin, who took the iniative for Torsby Environmental Protection Group in northern Vermland. This group has probably reacted more actively than any other against the "Hormoslyr"

Quite recently it called on the parliamentary agricultural committee in Stockholm and presented a large number of cases which indicate that "Hormoslyr" has demanded its tribute.

"Then we also wanted the municipalities to have the sovereign right to prohibit spraying with poison within their boundaries," continues Lars Lundin. "The decision should be decentralized to the municipalities whose inhabitants themselves should have the right and the possibility for prohibiting poisoning of their native place."

Lars Lundin and Torsby Environmental Protection Group absolutely believe that "Hormoslyr," which is sprayed out over the forests in northern Vermland, causes fetal injuries to children and many different types of cancer diseases, etc., in the population. Lundin himself has made an investigation and prepared a "cancer report."

It is not scientific, but it still shows, according to Lundin, especially how many forest workers who have worked with "Hormoslyr" spraying or who have worked in "Hormoslyr" sprayed forests have been struck by various forms of cancer and died. Lundin finds clear evidence for an unusually high mortality by cancer especially in forest areas which have been sprayed.

This unusually high mortality which Lundin talks about as well as the many fetal injuries to children in northern Vermland are now being subjected to an interdisciplinary investigation by the social administration.

That Lars Lundin, who is 60 years old, a few years ago started getting interested in environmental questions and the spreading of poisons to such a high degree is to some extent associated with the fact that he himself became sick.

"I worked on the family farm at Torsby and was struck by a poisoning from the strong poisons used in the barn in order to keep it clean from, for instance, flies and other insects," says Lundin. "I became very sick and was later struck by one disease after another. At the same time I heard talk about 'hormoslyr' injuries. I decided to assume my part of the responsibility and called on the authorities on the subject, and Torsby Environmental Protection Group was later formed."

Today Torsby Environmental Protection Group has members all over the country, for instance in Stockhom and Soedertelje. There are many people in the group who organize and work actively to stop the spreading of the poison. The actress Solveig Ternstroem, for instance, has been actively interested in the environmental protection group, which she became aware of when she was in Vermland. Besides Lundin, she has been one of the leading people in contacting the authorities, etc.

"Spreading the poison in nature has gone far, maybe too far already now," maintains Lars Lundin. "But we must still do what we can to stop the successive, senseless destruction of nature, which year after year gradually sneaks up on us. We must break the vicious circle in order to survive."

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END