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'ACIDIC MIST' OVER CITY ALARMS CALCUTTA

Calcutta THE STATESMAN in English 31 Jul 78 p 1

[Text]

By a Reporter

AIR pollution is assuming alarming proportions in parts of Calcutta, where people are becoming more vulnerable to accidents and diseases. If preventive action is not taken, experts apprehend that in another 10 years, Calcutta may face a situation comparable to the "Donora air pollution" in California (USA) in 1948 when the death toll rose to about 500 within an hour or the great "London Fog" of 1952 when London's links with the rest of the world were snapped.

According to Mr S. C. Banerjee, Chief Inspector, Smoke Nuisance Directorate, the two worst-affected areas are around Birla Planetarium and the Ultadanga station. In both areas the content of sulphur dioxide in the air has increased considerably.

Near the planetarium, the amount of sulphur dioxide in the air is now about 74 parts per million parts (p.p.m), forming an "acidic mist" with the moisture of the air. The earthwork done by the Metropolitan Transport Project contributes to pollution by throwing up dust. The "acidic mist" and the dust combine to form a large number of aerosoles in the air, which affect visibility.

The traffic bottleneck in that particular place (again because of the tube railway work) are also contributing to the increase of sulphur dioxide in the air. The high percentage of fuel (exceeding 5%) and the exhaust fumes from stalled vehicles also affect the atmosphere. The number of vehicles is much larger in the BBD Bag area, but they have greater mobility and, as a result, there is less sulphur dioxide in the air.

The position is worse in the Ultadanga station area. In fact, the spurt in train accidents in that area during the last few years is believed to have been caused mainly by the polluted atmosphere there. Almost all drivers have complained that signals were not visible in the evening, according to railway sources.

ACID VAPOURS

Mr Banerjee said there were a number of acid-manufacturing plants on Bagmari Road and Mumaripukur Road, emitting acid vapours all the time. As in the Birla Planetarium area, these acid vapours, mingled with dust particles form aerosoles, reduce visibility to a great extent in winter. The only way accidents in the station can be averted, Mr Banerjee felt, was by closing all the plants. "Accidents or no accidents, the position is dangerous," he added.

The existing Smoke Pollution Act, which came into force as early as 1905, is inadequate to cope with the problem. Strangely, no changes have been made to the Act since 1905. The Central Air Pollution Act has been under consideration since 1972.

The Chief Inspector felt that modification of the existing Smoke Pollution Act was urgently needed to cope with the problem and to gear up the department concerned. Referring to the Water Pollution Board, he said the board had not been able to organize its "infrastructure", though the Bill was passed by the Centre a couple of years ago.

The proposed amendment to the Smoke Nuisance Act, Mr Banerjee said, should be implemented immediately, for it covered all aspects of the air pollution crisis. He also was in favour of a scheme for an adequate "infrastructure" for the directorate. Other State Governments have passed or modified the Act without waiting for the Central Act. The Maharashtra Government has recently done so. "Why should West Bengal wait?" Mr Banerjee asked.

In Calcutta, about 6,000 industries emit 396 tonnes of smoke every day. Vehicles emit about 358 tonnes of smoke and soot a day, while the contribution by households is 126 tonnes. These were revealed in a survey, undertaken by the National Environmental Engineering Research Institute recently. Indiscriminate burning of rubber tyres, wood-chips and other items, especially in winter, add to pollution. The consequent health hazards also require preventive measure for pollution is believed to hasten the growth of cancer and respiratory diseases.

The Smoke Nuisance Directorate is "crippled" mainly because of shortage of staff. There are only three inspectors to supervise the operations of 6,000 factories and about 27,500 furnaces in and around the city. This not only makes supervision difficult but also leads to an annual loss of about Rs 3 lakhs in Government revenue.

CSO: 5000

WATER PURIFICATION PLANTS WORK UNSATISFACTORILY

Sofia OTECHESTVEN FRONT in Bulgarian 21 Jul 78 p 2

[Article by Georgi Pavlov, chairman of the Committee for Environmental Protection, Council of Ministers: "Construction and Operation of Water Treatment Plants"]

[Text] Maintaining the cleanliness of water flows and basins and making integrated use of water are among the basic thrusts in efforts to clean up the environment. In a number of the country's regions, the water balance is negative. Water is a major natural resource and an essential raw material for industry, and in some places it is already in short supply.

To protect bodies of water against pollution from sewage water from population centers and industrial enterprises, efforts are underway to build effective treatment plants and reduce the amount of industrial waste water by introducing waste-free production technologies and water recycling.

Normal operation of a treatment plant depends on its design, construction, and operation. Each of these factors may be the cause of improper functioning and inadequate performance of a plant. For this reason, it is essential to find new technologies which make it possible to eliminate pollution and utilize wastes in production itself, and also to find other technical and technological solutions for higher-quality water treatment.

Despite the successes we have achieved recently in the field of design, we also find a number of design errors, for example, inadequate or low-quality blueprints or the acceptance of wrong initial data. The best illustration of this can be seen in the waste industrial water treatment plant of the Kostinbrod poultry-processing plant, the waste water treatment plant for the Sofia Rodopa meat combine, the treatment facility in the fuel oil operation of the Al Voykov DZK [State Boiler Plant] in the city of Novi Iskur, and others.

The problem of high-quality and on-time completion of the construction of treatment plants is an urgent one in this country. The state is allocating substantial funds to implement adopted programs. The reasons for failure to

complete projects on time and up to standard are many and various, but the main one is failure to appraise the problem properly.

Delays in the construction of treatment plants are also the fault of the investors, who are not properly meeting their obligations with respect to financing, conclusion of contract, assurance of timely delivery of machinery and components, and construction assistance.

Excessive delays in scheduled construction of treatment plants cause funds to be tied up inefficiently, construction machinery to be committed for long periods of time, and design applications to become obsolete before they can be put into operation. Most important, they excessively delay the process of cleaning up water flows and basins and bringing them up to standards governing the particular category. For example, the Lyutadzhik tailings dump in Eliseyna and the Golyam Bukovets dump in Chiprovtsi were started in 1974. Final completion is now set for 1979. Construction of the treatment plant for the Garant Metallurgy Plant in Byala Slatina began in 1973 and was supposed to be finished by 1976, but it is still not ready. The Ministry of Construction and Construction Materials will have to take urgent steps to ensure on-schedule and high-quality completion of construction-installation work on waste water treatment plants.

After the creation of the Committee for Environmental Protection under the Council of Ministers as a specialized agency, its prime and basic task was to make all treatment facilities operational and to institute strict control over inoperative or poorly-operating plants. In collaboration with ministry, state economic association, and enterprise management, specific programs and schedules were worked out along with measures designed to improve the efficiency of the treatment in poorly-operating plants.

In compliance with adopted schedules and programs last year, 232 treatment plants improved their performance, and 71 of these achieved full treatment efficiency.

After remodeling, the Khaskovo treatment plant went into operation; today it operates with a capacity of over 100 liters/ second. The operational start-up of the sludge-storage facility in the Medet MOK [Copper Concentration Combine] makes it possible for water recycling to reach 86,000 cubic meters/day. Water recycling is also in operation at the V. Kolarov Sugar Combine in Plovdiv. With the start-up of facilities in 1977, 155,000 cubic meters can now be treated every 24-hour period.

At present, 8.3 percent of the treatment facilities are functioning unsatisfactorily and require prompt remodeling and modernization in order to boost their capacity, also the introduction of new treatment technologies and so on.

Despite good achievements, some treatment plants are still functioning poorly. For example, the facility in the Ho Chi Min Plant in Stanke Dimitrov, the

Chemical-Pharmaceuticals Plant in Stanke Dimitrov, the municipal treatment plant in Karnobat, treatment facilities of the poultry-processing plants in Ruse and Razgrad, the incinerator facilities in Khaskovo, Pleven, Burgas, and Vidin, the meat combines in Sandanski, Gotse Delchev, Troyan, Srednogorie, Tolbukhin, and others.

It should be noted that over 45 percent of these facilities are in enterprises of the system of the Ministry of Agriculture and Food Industry. Low efficiency characterizes the performance of many facilities in units of the Ministry of Electronics and Electrical Engineering, the Ministry of Transportation, the Ministry of Chemical Industry, the Ministry of Metallurgy and Mineral Resources, the Ministry of Machine Building, and others. It is essential that the officials of these ministries and their units undertake specific actions to provide prompt repairs, remodeling, and proper operation of treatment facilities.

The Vodokanal Proekt KNIPIBKS [Complex Scientific-Research and Design Institute of BKS] has set up a group of experienced specialists to regulate the treatment process in order to set optimal operating conditions for treatment plants. The group is preparing instruments and automation equipment for the whole technological process.

The essence of the preparation is to proceed on the basis of the composition of the waste water in order to determine and develop the best types of bacteria for the biological process and to adjust the appropriate equipment to ensure optimal treatment efficiency. The group issues the necessary recommendations, helps to choose the best technological operating conditions, and performs start-up and adjustment work on the equipment.

The results of these efforts have been positive, but the small group is still not up to the task of keeping pace with the rapidly-rising needs of production-operational personnel for scientific-technical aid in order to achieve maximum efficiency from the introduction of treatment plants and facilities.

In many places enterprise managers, in order to economize, have been in no hurry to assign the necessary number of qualified personnel to treatment plants; naturally, this has led to substandard performance of the facilities. In the treatment facility at the Petrochemical Combine in Burgas, where treatment efficiency is inadequate, the management has been striving to save on electricity and reagents. Aerators, pumps, agitators, and so on have been shut down, and chemical treatment has been inadequate.

In some plants, logs are not kept on the treatment process, or else they are kept only formally, without technological analysis in order to decide on timely adjustment of the process to achieve maximum efficiency.

At present, the worst polluters of bodies of water are the sewage systems of population centers, which receive waste water from industrial enterprises constituting over 50 percent of the country's total industry. The treatment plants in some facilities are overloaded, and their efficiency is low. This

is the situation at the Food and Feed Yeasts Plant and the Magnetic Heads Plant in Razlog, the G. Dimitrov State Wood-Processing Plant in Troyan, the S. M. Kirov Feed Combine in Dolna Mitropoliya, the dairy complex in Kurdzhali, and elsewhere.

In recent years, preference has been given to the construction of municipal treatment plants and facilities in the most heavily polluted regions in the upper reaches of rivers.

Without accelerated construction and channeling of capital investments into the construction of municipal waste water treatment plants, and unless the most efficacious solutions are found for their construction, because of diminished funds and delayed start-up deadlines the effect to be gained from their construction will be threatened and the directives issued at the 11th Party Congress with regard to cleaning up the waters and rivers may not be implemented.

During this five-year plan, construction is underway on treatment plants for the country's biggest population centers: Sofia, Plovdiv, Varna, Burgas, Pleven, V. Turnovo, Gabrovo, Vratsa, Tolbukhin, Sliven, N. Zagora, St. Dimitrov, Pernik, and elsewhere. They will be used to treat most of the household and sewage water. Nevertheless, construction is encountering great difficulties. On the one hand, funds stipulated in the annual plans are not adequate to complete plants that were begun in the last five-year plan; on the other, despite the decision of the Secretariat of the Central Committee of the Bulgarian Communist Party, some ministries and okrug people's soviets have been reducing these funds and diverting them for other purposes. For this reason, work on projects has been disrupted, and deadlines have been delayed.

The worst thing is that the normative timetable for the construction of treatment plants--2.5 years--has not been complied with. For example, the treatment plant in Vratsa was supposed to be built by 1969, those in Sliven, N. Zagora, and V. Turnovo by 1973, and those in Gabrovo, Pernik, St. Dimitrov, and Sofia by 1974. The deadline on some of these plants has been postponed several times. According to the five-year plan, facilities were to be completed by 1978 in Vratsa, V. Turnovo, G. Oryakhovitsa, and St. Dimitrov, but according to the 1978 plan the only operational one is that in Vratsa.

The funds allocated through 1980 will not permit the completion of 14 municipal plants already begun. But the aim should be to build them quickly, not to tie up funds, in order to achieve effect. For example, the results of systematic construction of treatment plants have already been felt in a number of river valleys. Formerly, the Struma was severely polluted. With the completion of the municipal plant in Kyustendil, the excavator station at the Republika TETs [Thermal Power Plant], the Lobush integrated reservoir, and others, waters in the upper reaches of the rivers are already suitable for use in agriculture. After large municipal treatment plants go into operation in Pernik, St. Dimitrov, and in a number of industrial facilities,

the waters of the Struma will be even cleaner and can be used directly by consumers. To resolve this task, work is now underway on instituting mechanized haulage of cinders and ash from cinder dumps and accelerating the treatment of waste water from the Bobov Dol TETs. The situation there is quite alarming. Deadlines have elapsed, and the measures stipulated by the Ministry of Power Supply are not being implemented.

The water in the Yantra will have to be cleaned up from its headwaters to G. Oryakhovitsa. The Gabrovo and V. Turnovo plants, and others, will have to be completed by the end of the five-year plan. This will undoubtedly help to solve the problem, but the responsible okrug people's soviets are not paying enough attention to their construction.

Pollution of the Beli Lom has been reduced thanks to improvement in some of the produciton technologies at the antibiotics plant in Razgrad and partial treatment of its waste water by the Razgrad municipal plant. It is essential that the Ministry of Chemical Industry fully implement its own decisions to ensure specific treatment of the plant's shops.

Unquestionably, the groundwork is being laid for rapid improvement of water cleanliness in other bodies of water as well. The process, however, is a slow one, but the opportunities are there and they must be utilized.

The efforts being made by the Committee for Environmental Protection under the Council of Ministers are directed primarily toward reducing the amount of waste water discharged by enterprises and reducing pollution by introducing recycled water supply systems and advanced waste-free production technologies.

The aim is to have minimum capital investments and operating costs while achieving the optimal cleanliness and best possible economic effect.

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CSO: 5000

ENVIRONMENTAL MEASURES SUBJECT OF CONTROLS, LEGISLATION

Rigid Sanitation Controls

Montevideo LA MANANA in Spanish 1 Jul 78 p 23

[Article by J.J. Rodriguez Gordon]

[Text] The municipal mayoralty is carrying out a strict environmental control campaign and the inspection of waste water.

The inspection is being done on Freire, Lavalleja, Saravia and Independencia streets and violations have been found.

Residents are being asked to cooperate and a warning has been issued concerning the possibility of the application of penalties in the case of repeat offenses and neglect.

Inspections are also being made of properties with trash piles and the existence of rodents is being carefully watched in areas such as Tablada, Curtiembre, Arroyo Tomas Gonzalez and the continuation of Calle Lezaeta in order to ensure proper conservation of sanitary conditions following the extermination campaign waged in past months.

Sanitation Rates, Property Cleanness

Montevideo EL DIA in Spanish 23 Jul 78 p 15

[Excerpt] New rates will go into effect on 1 July and continue until 31 December for new sewer connections falling under the commune of Montevideo's responsibility.

According to an official announcement, the price per linear meter when the projects have been completed by the municipal Civil Engineering Projects Maintenance Service will be 170.20 pesos if the diameter of the connection is .10 meters. If the diameter is .15 meters, the price per linear meter will be 175.20 pesos.

In cases where the owner of the building helps with the digging and filling of the trench, the connection measuring .10 meters in diameter will cost 140.60 pesos and the .15-meter connection will cost 145.40 pesos.

Uncultivated Land

In accordance with the ordinance set up by municipal decree 14.001 (Article 17), any owner of uncultivated lots in this capital is required to keep them free of refuse and garbage. Such lots must be fenced so that improper use is not made of them and in order to safeguard the cleanliness and health of the population. When such requirements are not met, the communal authority has the power, following notice to the owner to correct the situation, to clean up the untidy lot through the Garbage Collection and Sweeping Service and make the owner of the property bear the cost.

The communal executive authority has just updated rates to be applied to the task of eliminating unhealthy sites. In the future, the hourly rate per worker will be 5 pesos and the rate for the foreman will be 6 pesos. The rate for the use of the truck to haul refuse will be 42 pesos and the rate for the mechanical shovel used for cleaning will be 152 pesos.

Salto Hosts Environment Seminar

Montevideo EL PAIS in Spanish 9 Jul 78 p 19

[Article by Alberto Rodriguez Diaz]

[Text] "Salto Grande is an example for the world of how such projects should be undertaken and I want to emphasize that here we are already using many of the substantive advances that have been achieved in the area of environmental protection. This project is an outstanding example for the world because it takes advantage of and promotes proper use of what we already know about the protection of the environment." This statement was made by Dr Gustavo Malek, UNESCO representative for Latin America and the Caribbean, when he spoke at the opening session of a seminar on Monday.

The seminar, whose purpose is the training of officials in the application of standards aimed at protecting the environment in the dam area, will continue until Friday, 7 July.

The opening ceremony was presided over by the vice president of the Salto Grande joint technical commission, Dr Rjtilo de Paula; the mayor of Salto, Col Guillermo De Nava; the mayor of Concordia, Rafael Tiscornia; the UNESCO representative for Latin America and the Caribbean, Dr Gustavo Malek; and Dr Carlos Adlerstein, director of health, ecology and regional development of the CTM [expansion unknown].

The event, sponsored by UNESCO, was organized by the Salto Grande CTM for the purpose of training technical personnel in the application of standards for the protection of the environment.

In his address, Dr Malek made the following remarks:

"At this opening session, it is a great pleasure for me to speak on behalf of the general director of UNESCO because the purpose that brings us here today is one that fits into the general framework of the vital problems relating to environmental science, as it is now called, a matter to which we now assign high priority.

"First of all, I wish to extend special thanks to the authorities of the Salto Grande joint technical commission for the opportunity they have given me to deliver this address and congratulate them for the work they have accomplished. Without exaggerating in the least, I can say that your work, which is of a high technical and social level, and the consistent lines of action being carried out, as at this seminar, can be considered, on the regional and even world level, as an example of how a project of this scope should now be faced in an integral fashion. This fact should be pointed out and special emphasis should also be placed on the fact that it is a joint undertaking of two brother countries, which in addition to offering an example of horizontal technical cooperation, demonstrate the extremely important aspect of leading toward integration. One day, cases such as these will provide us with firm foundations for a broad integration of countries throughout the region, that highly sought-after and evasive integration.

"All of those here present will recall that on 5 and 6 June 1972, 1,200 delegates from 140 countries met in Stockholm to hold the World Conference on the Human Environment. At that meeting, a slogan was adopted that has turned into a symbol: 'One Single Earth'.

"It was the first time in the history of mankind that governmental representatives had ever met to evaluate the influence of man on the system which sustains life on the planet Earth.

"From that time on, the international community has actively sought to engage in concrete undertakings that would substantially contribute to the solution of environmental problems in developing as well as developed countries.

"In many specific fields, there is already sufficiently advanced knowledge and various disciplines also have the theoretical foundations and practical experience needed to provide concrete solutions to many environmental problems in addition to those of their own areas of specialization. By way of example, one might mention atmospheric pollution, the solutions to which have received an important contribution from biochemistry, inorganic chemistry, climatology, meteorology, topography, geology, engineering, and so on. Something similar has occurred with the pollution of the seas, the land and continental bodies of water and waterways, to wit, soil conservation, the quality of water, forest management, environmental health and integrated control of plagues. The solutions to every one of these problems have stemmed from knowledge accumulated in various immediate provisions.

"On the other hand, we have little knowledge of the great complexity of the interactions that occur between the various elements in the environmental system. Our understanding of the influence of the social, economic and cultural aspects on the different problems of the environment is quite superficial and we have little knowledge of the role played by the needs and values which inspire man's activities in relation to the environment. At the same time, we still have insufficient scientific knowledge of the behavior of the ecological systems, considered to be a whole, and especially, about the mechanisms aimed at maintaining their stability and absorbing natural environmental impacts or those deriving from human activities. There are many unknowns about the laws governing the natural processes, those which determine the socioeconomic and sociocultural processes and their interactions.

"And yet, there have been substantial advances in the recognition of the possible ways in which the environmental dimension, the essence of the holistic viewpoint, may be introduced into the different disciplines and sectors."

Salto Grande: Vanguard

"On this point, I should like to say that in the specific case of Salto Grande, many of these substantive advances are already being used and I would emphasize that it is one of the foremost examples on the world level in which the people are taking advantage of and promoting proper uses. At the same time, there can be no doubt that there is here an excellent understanding of the improved comprehension of the innumerable problems that arise and the concrete actions leading to their solution.

"In the field of development, one can glimpse several positive prospects for the future of the socioenvironmental situation. In the past five years, the holistic environmental outlook has begun to show alternative strategies of development instead of the traditional forms. Such strategies have emerged from new ways of viewing the interrelations between the environment and development.

"During this period, there has been an extremely wide range of experience accumulated in certain priority spheres such as the handling of natural resources in various types of ecosystems, human settlements, environmental and community health, hydraulic resources, the management of major engineering projects, food products, natural fertilizers, energy, natural disasters, oceans and the population. In each one of these vertical sectors, which constitute important elements of a given environmental sector defined in time and space, there is a beginning of the promotion of a multisectorial and multidisciplinary concept for the implementation of a systematic, overall ecological management. You have the example before you in Salto Grande.

"Based on such a concept, new multidisciplinary methodologies for environmental regulation and management, new techniques for evaluation (systems of environmental monitoring), methods for evaluating processes of deterioration

(expansion of the desert, pollution, erosion, deforestation, fires), new systems of information and references, the formulation of national and international legal frameworks, the analysis of systems to be applied to the trends of the development process, the environment and natural resources, the creation of new methodologies for education, training, administration, and so on, are all possible.

"These methodologies could make up for the limitations presented by each sector precisely if one thinks and acts sectorially and presented by each discipline if they do not go beyond their own sphere. The problems affecting the environment and the development processes are above all holistic in nature. The fact that certain sectors and disciplines have not acted in concert with the rest has caused many of the difficulties in implementing environmentally sound development policies.

"Because of all of these things, we can state without a doubt that the question of the environment requires a new kind of development.

"Today, in both the developing and industrialized countries. it is recognized that there is an intimate relation between the economic, social and cultural aspirations of man on the one hand and the heritage of natural resources and the environment on the other. These resources constitute the main means of achieving those aspirations. Consequently, environmental questions have inevitably been turned into a global topic and are increasingly confused with the complex set of economic, sociopolitical and cultural matters now confronting mankind.

"As a valuable result of this view, we have identified the root of one of the most critical problems of our contemporary society: the interrelation of the development process with the environment. This is a matter which, despite its profound importance, had not been noted by past generations."

"Ecodevelopment"

"As a result, the final solution will only be possible through the implementation of an alternative type of development: ecodevelopment which, based on an environmental doctrine, manages to overcome the disadvantages of current patterns. I wonder: Here in Salto Grande, are we not already working with this criterion?

"In order not to stray into irrelevant discussions, we must always remember what Strong said: 'Not only are development and the environment not opposed to one another, but rather, they constitute two different aspects of the same concept."

MAB Project

"In order to conclude my address, I should like to mention that within the vast program which UNESCO heads under the initials MAB (man and the biosphere) -- there are 14 principal changes -- Project 10 is specifically

aimed at studying the effects on man and his environment of the designs and completion of major engineering projects. MAB 10 is an eminently 'integrated' project of the holistic type and it has to do with any human action that would have an impact and great repercussions on very extensive areas of the natural environment and human populations.

"The major engineering projects that we intend to be essential instruments of economic and social development also entail, as we all know very well, great environmental and social costs, sometimes because of the application of inappropriate technologies, sometimes a lack of knowledge or criteria for evaluation, and finally, because of the physical limitations of the environment. Scientists, professionals and other interested groups have an enormous role to play in the resolution of these problems, especially in order to make the process of planning more sensitive to social and environmental issues.

"Based on these criteria, the powers of political decision-making will indubitably have perfect knowledge of alternatives of the highest technical and human level.

"In order to carry these ideas forward in their many phases, we always come to an essential point: We need trained human resources. That is the objective of this seminar: to train local officials for environmental administration.

"It is also interesting to note another substantive element of ecodevelopment: the participation of the community. Such participation is very important since aside from the many obvious advantages it presents, it gives those responsible for decisions and our specialists a definite certainty that the higher interests of the region and the nations will prevail over individual preferences and viewpoints, which we believe are always honest but which may be partial.

"I should like to reiterate our praise for all the officials and persons responsible for this extraordinary project, which is a model for the world. I salute you and on behalf of UNESCO, I wish you success in your work. The shortest distance between two points is never to stop and here in Salto Grande, that truth has a magnificent example."

11,464
CSO: 5000

FRENCH ENGINEER EVALUATES SERIOUSNESS OF EROSION

Montevideo EL DIA in Spanish 1 Jul 78 p 24

[Article by Daniel Goman]

[Text] A few days before he returned to France, agricultural engineer Jean Claude Revel, assistant at the Toulouse Laboratory of Pedology, held a press conference at the French Embassy to describe the impressions he gained from his stay in our country.

Also present were the director of soils and fertilizers, engineer Ruben Dotti, agricultural engineer Gustavo Sacco, a technician from that directorate, and Gerard Faroux, cultural and scientific and technical cooperation attache at the French Embassy.

The basic purpose of Revel's visit was to lend his assistance in working with the technique of thin sheets. For the past few weeks, the Soil Directorate has had modern equipment for this procedure, obtained within the framework of a French-Uruguayan cooperation agreement dating from 1967, an agreement that has led to tangible progress in the field of research into and the study of our soils.

Thin Sheets

"The thin sheet technique," Revel said, "consists of including the soil in a material that hardens it. It is attached to a sheet of glass until it has a thickness of 0.03 millimeters. It then becomes transparent and it is possible to observe it under the microscope by transmitted light. Its applications are many, including the study of the transformation of primary materials into secondary materials in order to see how the soil was formed. One can also see the different phases that have taken place (pedogenesis). From the practical standpoint, it is possible to observe the microstructure of diagnostic horizons, recognizing and classifying the soil by means of the visualization of the thin sheet, in drawing up maps, for example. One can also see the means of aggregation and structural stability. It so happens that this property is in direct relation to resistance to erosion, which makes it possible to anticipate the risk of erosion before starting any given crop."

Problem of Erosion

Revel praised the work being done by the Soil Directorate, work that has recently made it possible to publish a map with a scale of 1/1,000,000. "The information which you possess on the soil is comparable to that of France," he said.

For 4 weeks, he toured the coastal agricultural area, Tacuarembo and then along Route 5 as far as Montevideo. He was able to observe organic soils with characteristics only found on the Plata River.

When asked about the problem of erosion in our country, Revel said that his tour "made it possible to place soils in three categories":

Wasted, thin soils found in certain basalt areas or in the crystalline "edges." For the time being, they are used for intensive grazing and suffer little from erosion, but they must be watched or else these areas will be totally transformed into deserts.

Poor, but deep soils (area between Rivera and Tacuarembo), where erosion takes away the upper layers of the soil but which, due to their thickness, can still be used for crops.

Rich soils, whether deep or superficial (western coastal zone), where erosion takes away the richest and most fertile layers. Intensive erosion becomes catastrophic here.

"Not Heavy"

"To date, erosion has not been very heavy, but it seems to be accentuated with the development of agriculture. In this case, we must differentiate between different degrees of erosion. We shall speak of only two: erosion that can be corrected by means of mechanical methods at the time of crop growing ('laminar' and 'trough' erosion). The methods to be used consist of appropriate growing techniques such as horizontal levels or alternate bands: contour farming. Some farmers on the western coast are partially using these techniques, which after the necessary experimentation should become more widespread. The Soil Directorate is working actively on these aspects, adjusting techniques," the French expert said.

"The other case is when erosion has reached too great an extreme to be corrected ('gullies' or 'gulches'). One must then resort to conditioning (tree planting, for example, in order to stabilize banks and pastures)."

Revel defined Uruguayan soils as "highly diversified and containing a high degree of organic material, which makes their richness (reserve of fertilizing elements)."

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HEAVY RAINS CALL FOR EVACUATIONS, ALERT

Itapebi Arroyo Overflows

Montevideo EL DIA in Spanish 1 Jul 78 p 12

[Article by Wilfredo Paiva]

[Text] For hours, the possible fate of the Yacare Bridge was uncertain due to the flooding of the Itapebi Arroyo on Route 3.

EL DIA recently reported on the deforestation projects carried out in the areas affected by the formation of the Salto Grande Lake. The projects are located along the mountains on the banks of the arroyo in question.

The work is practically finished but it so happens that the large trees that were uprooted were were left along the waterway so that they could be removed when convenient.

With the recent rains, the waterway overflowed its banks and carried toward the little bridge hundreds of heavy tree trunks that accumulated to form a dam next to the bridge.

As mentioned, the situation was a matter of concern to the Highway Directorate, which immediately took the proper measures so that the enterprise responsible for deforestation would clean out the waterway.

This fact and the cessation of the rainfall made it possible to correct a situation that could have been extremely serious since the Yacare Bridge is the only way by which Route 3 can reach the north, where El Espinillar, Constitucion and Belen are located and where bridges and branch roads are being built.

Mercedes, Durazno Evacuate 113

Montevideo LA MANANA in Spanish 2 Jul 78 p 20

[Text] Yesterday there was a considerable increase in the number of persons evacuated from areas in the interior of the country certain to suffer this type of problem due to the flooding of rivers and arroyos.

We are specifically referring to the areas on the banks of the Negro River at Mercedes and the Yi River in the vicinity of the city of Durazno. In all, some 113 persons are involved, 68 from Durazno and 45 from Mercedes.

While the situation is tending to return to normal with respect to road traffic due to the good weather over the past 48 hours, an increasing number of persons is being evacuated since the effects of the flooding have begun to reach areas generally susceptible to flooding.

Daniel Rondan, our correspondent in Mercedes, states that as a result of the flooding of the Negro River, 11 families totaling 45 persons were evacuated. They were housed in the facilities of the Luis Koster Municipal Stadium and at the Leonel Rocca Municipal Velodrome.

The entire coastal zone is affected by the flooding of the Negro River, which despite the fact that it has not rained, has risen at the rate of 5 centimeters per hour, a rate that tended to drop last night. Jose Batlle y Ordonez Avenue is partially covered with water and the flood has also affected Guernica Park, the Isla del Puerto resort, the facilities of the Remeros Mercedes Club and the El Surubi and El Ayui fishermen's clubs. At 1000 hours yesterday morning, the waters were 5.65 meters above their normal level and at 2100 hours, 6.10 meters above that level. It should be added that the highest level reached was on 19 March, when the waters were 8.98 meters above the normal level.

Durazno

The level of the waters of the Yi River is constant, but they are 9.10 meters above the normal level. This has led to the evacuation of 24 families totaling 68 persons: 29 adults and 39 children.

By last night, high vehicles could cross the Malbajar Arroyo and it is presumed that communications will be restored since traffic in other areas of the department is normal.

Mercedes Records 30 More

Montevideo EL PAIS in Spanish 2 Jul 78 p 1

[Article by Ricardo Nole Llaguno] Mercedes--A total of 16 families numbering 75 persons have had to abandon their homes in recent hours in a broad strip of land along the Negro River, which began to rise at an increasing rate 2 days ago, reaching the figure of 6 centimeters per hour.

The flooding, caused by the heavy rains this past week, comes only 3 months after the rising waters which flooded a large part of the city of Mercedes.

In a matter of hours, the waters of the Hum covered most of the beautiful Jose Batlle Avenue and the task of rescuing many families began at noon.

The rise was very rapid and in a few minutes, the river waters passed the 5.60 level in the morning. By noon, they were up to 5.70 and by nightfall, they were at 6 meters. The waters continued to rise at a rate of 4 centimeters per hour.

Several points along the Mercedes coast and the broad zone of the Guerkika Park were totally covered by the flooding Negro River waters. It is estimated that the situation will continue to grow worse for at least 48 more hours.

The opening of the gates of the Gabriel Terra Dam caused the flood.

In rural areas, livestock owners had to work furiously in order to evacuate animals from the flooded regions since the rate at which the waters rose was sometimes incredible.

It is reported that the situation is under control.

In Galarza and Rio Negro, the first families have left, and information from Palmar indicates that the rise in the river continues to be slow in recent hours.

Route 14 is still cut off by the flooding of the Grande Arroyo and there have been some problems along access roads.

Yi River: Slow Abatement

Montevideo LA MANANA in Spanish 5 Jul 78 p 8

[Article by Jesus Carlos Correa]

[Text] At an extremely slow rate, less than 3 centimeters per hour, the waters of the Yi River have begun to drop in recent hours as they pass through this city.

According to information from the Guard Office of the local Police Headquarters, the river began to drop early Tuesday morning. The families that had been evacuated as a preventive measure have already returned to their homes and another 28 families, including 53 adults and 83 children, are waiting for the waters to drop further.

Victims are being housed in cars and sheds of the AFE [State Railways Administration], where sanitary conditions are reportedly normal. Official spokesmen say that if the water level continues to drop, everything will be back to normal by Thursday. It only remains to be seen how long it will take for the properties affected to dry out. Their occupants should not return immediately. In order to prevent disease, it is recommended that people wait for all dampness to have disappeared.

For many persons, the problem is not so simple. Every time there is a flood, there are usually two or three families who remain homeless when

the Yi returns to its banks since the waters have carried away their homes. This uncertainty affects many families from the Puertos de los Barriles and La Amarilla districts, whose properties are in the area hardest hit. The flimsiness of construction and the fact that this is not the first flood the homes have had to withstand give rise to this period of nervous waiting to see whether the dwellings still exist.

More Rain Causes Alert

Montevideo LA MANANA in Spanish 29 Jul 78 p 8

[Text] The intense rainfall that has fallen in recent hours throughout the nation has, while not causing alarm, alerted the authorities in several departments to the consequences that might occur in the coming hours.

While in Salto the Uruguay River is at 7.97 meters above 0 and continues to rise, the situation could cause serious problems due to the delayed planting of wheat and with respect to cattle to be fattened. The current situation would prevent the unloading at the port of the departmental capital of the turbine shafts for Salto Grande which are expected early next week.

In Fray Bentos, an area in which there are rarely problems resulting from the flooding of the Uruguay River, the evolution of measurements has shown a marked increase, going from 96 centimeters above 0 on Wednesday to 1.40 at the last measurement yesterday evening. It has also been reported that at 0100 hours on Friday, the level was 1.60 above 0.

Durazno: Waiting to Evacuate

In the city of Durazno, the situation was one of tense expectation due to the rise in the waters of the Yi River, which although they have not reached the point of evacuation, have nevertheless caused authorities to take measures during the next 24 hours if the rise should continue.

For its part, Mercedes, which presents a similar problem with the Negro River, does not have a worrisome situation since there has been only light rain in recent hours. The situation is nevertheless one of vigilance.

Canelones

Last night, Jose Seraolo was traveling in his car, accompanied by Isaac Rodriguez. They were on Route 67 between Las Piedras and Sauce when, while crossing a roadway without any railing, the current seized the vehicle with its occupants inside. Seraolo managed to escape from the automobile and pulled Isaac Rodriguez to the surface, but due to the strong current, the latter was dragged away. He managed to grab hold of a tree sticking out of the water and Seraolo, who had reached the bank, once again went into the turbulent waters to save his companion.

The car has not yet been found.

Meteorology

The General Directorate of Meteorology has established that the amount of rain that has fallen throughout the country varies.

Punta del Este received 21 millimeters; Rocha, 16. In Montevideo, the amount was similar to that of the National Airport of Carrasco, with 6 millimeters.

In Melo, Paysandu and Rivera, it is considered impossible to measure the amount of rain that fell due to the small volume.

Bridges are out on Route 30 to Tacuarembo, Route 29 in Arroyo Corrales and Route 27 in Tres Puentes.

The ONDA [expansion unknown] enterprise reports that it cannot communicate between Salto in the north and Tomas Gomensoro, which has been the case since Thursday.

The entire country is waiting to see what will happen in the hours to come.

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CONCERN FOR WATER INCLUDES EXPANSION, SHORTAGE FEAR

Drinking Water Expansion

Montevideo LA MANANA in Spanish 29 Jul 78 p 19

[Article by Carlos Alvarez]

[Text] Dolores--Based on a plan drawn up by the OSE [State Board of Sanitation], this city's drinking water system will be expanded by 7,600 meters in order to meet the priorities of the different districts. Work will soon begin and has been entrusted to a private enterprise, according to information made public.

Running water was installed in Dolores in 1942 and there are now some 2,500 connections. The water comes from nine semi-submerged wells located in the "drilling zone" and equipped with electric pumps. The capacity of the distribution tank is a half million liters.

Possible Drinking Water Shortage

Montevideo EL DIA in Spanish 31 Jul 78 p 4

[Text] Authorities are still concerned with ensuring a normal supply of drinking water to different localities in the country. The OSE is the organization in charge of the projects involved.

In Rivera, the population of Vichadero recently made new demands and even presented a more ambitious preliminary plan in order to provide a broad solution. The president of the OSE, Nicolas Goloubintseff, said, without discarding the proposal, that for the time being, the organization was awaiting the result of a third drilling located a few kilometers from Vichadero. If the drilling should yield positive results, it would ensure a supply of the vital liquid.

Villa Tupambae merited similar attention and this week, the Executive Branch ordered an expropriation for the purpose of permitting the OSE drilling that will supply water to that area. In agreement with the

minister of transport and public works, the president set forth a resolution designating a parcel of land located in the eighth judicial section of Cerro Largo (Villa Tupambae) to be expropriated "for reasons of public usefulness," declaring "its occupation to be urgent" and "necessary for the drilling of well No 1191/4 (OSE), which will supply drinking water to Villa Tupambae."

Water: A Public Interest

Montevideo EL DIA in Spanish 28 Jul 78 p 5

[Text] The proposals made in international organizations and various local centers in several countries concerning the effects of environmental pollution which threaten water are very serious.

They have to do with health, production, the economy and in general, the existence of civilization. Even before the movement for the protection of the ecology gained strength, we emphasized the need to define a water policy in the country in order to attenuate the effects of erosion, form reserves regulating the use of the water in our rich river system which is lost without being properly harnessed and in sum, attempt to gain important economic benefits due to the influence of irrigation on agricultural production. In addition, the construction of dams, dikes and other projects for the regulation of water supply positive elements for all human activity and for the conservation of species useful to man.

In some places, official and private entities which practice ideals of service to the community promote campaigns of instruction and propaganda in order to induce the people to make prudent use of water, creating awareness that not only does mankind need more water, but the water used must have high levels of purity for hygiene, health and crops. The subject is of such importance that it is considered to be a matter of public interest and there is every reason that this should be so.

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MANY ASPECTS TO CONSIDER IN RIVERA FORESTATION

Montevideo EL DIA in Spanish 25 Jul 78 p 9

[Article by Jose Luis Vera]

[Text] Another one of the topics put before the national government by the delegation from Rivera during the work session which Dr Aparicio Mendez headed at the Hotel Casino had to do with forestation.

Agricultural engineer Juan E. Longinotti spoke for the local workers and his report was considered to be very interesting, as in the case of the problem of citrus crops of which we spoke on Saturday. Longinotti was congratulated by the president of the republic and the acting minister of agriculture and fishing, chemical engineer Luis H. Meyer.

It was repeated at the meeting that the sandy prairies in Rivera have been declared to be an area of priority for forestation. While activity is proceeding at a good pace, it must be promoted even more.

Longinotti told EL DIA that our country has a legal tool, Law 13,723, regulatory decrees and other provisions which in one way or another tend to put into practice a policy of national forest development. The law is clearly promotional in nature and is based on tax benefits, a credit policy and industrial promotion.

Forestation in Rivera

The national government was informed of the different means that could be used to promote forest development in Rivera, to wit:

Credits: Longinotti said that taking into account the fact that forestation is a long-range operation (15 to 20 years), it is necessary to have a credit policy based on the type of operation in question. For the establishment of nurseries, for example, benefits are achieved in a shorter period of time, but this is not true when it is a question of the planting of forests, and although the forest law provides for the credit aspect, the Bank of the Republic does not currently have credit lines for forestation.

Despite the good intentions of the legislature and the existence of a study and proposal for the method of applying credits through the Forest Fund, it has not been possible to implement this important phase.

Machinery: Machinery built in the country -- specifically tractors -- cost nearly double what the original equipment did.

In order to apply the provisions of the promotional law -- that is, low-cost equipment based on the importation of specific machinery with a minimum of surcharges and tax-free -- all the procedures must be followed in order to protect the national assembly plants.

The speaker said that it is necessary to carry out the forest promotion laws, adjusting the negative points observed to the maximum extent.

Tax exemptions: The delegation from Rivera said that it would be fundamental to maintain a policy of tax revision in the development of forestion. In addition, the revision would have to be extended to the industrial sectors, which would then be able to reinvest their taxes in forestation, as neighboring countries have done with great success.

Labor: On this point, it was explained that the problem was similar to what is happening in the citrus crop area. The same solutions were recommended, having to do with regular courses and special short courses at the Rivera Rural Teaching Center, where personnel would be trained at different levels.

Establishment of industries: The people in Rivera know that if forestation should be concentrated in one region, which is very possible since the areas of priority have been designated, in the years to come, there will exist a very large forested zone, which would make it possible to set up zonal industries which would handle the overall processing of the lumber.

Roads: The delegation from the border city recognized that with respect to access roads, the proper authorities have faced the problem since it is a constant concern. As a result, they have deemed that it is necessary to maintain and intensify the opening up of new access roads, which have recently been accurately termed "integration roads."

Burning of fields: It was reported that fields are frequently burned off, which tends to destroy the dry vegetation in order to make the rapid regrowth of pasture possible. This handling of land, which is very common in areas used for livestock raising, should be very well regulated since it implies a serious danger to forestation, especially those species which are very combustible, such as pine.

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CSO: 5000

CONFLICT BETWEEN MAN, ENVIRONMENT IN MIDDLE EAST EXPLORED

Beirut EVENTS in English 11 Aug 78 pp 26-29

[Part I of a Series, "Environment Under Seige"]

[Text] The environment is under attack throughout the Middle East. Population boom, rapid industrialisation, urbanisation, intensive exploitation of oil wealth – these are just some of the elements which are combining to make unprecedented demands on the balance of nature in the region. We are asking the earth to give – and forgive – much more than ever before.

Are we despoiling the environment in a way which may permanently damage our ability to survive? Do we need a spectacular disaster, like the recent Amoco Cadiz oilspill in the English Channel, to stir us into action to forestall a creeping, long-term catastrophe? Or is environmental concern basically a dispensable luxury which developing countries cannot afford in their struggle to feed their people?

"We're far too busy developing," said one Arab environmentalist. "Nobody is really serious about the environment problem. Lip service is paid, meetings are financed and committees set up, but none of them has any power. Everybody agrees it's terrible, but very little is done."

The Middle East is probably the world's fastest-developing area. This rapid growth and industrialisation alone should be enough to arouse environmental concern, since even in such ideal conditions development invariably has some impact on the environment.

But Middle East conditions are far from ideal. The sudden influx of oil money into the region enabled it to buy in advanced technologies without having any experience of their application or impact. This technology is the fruit of more than a century's experience in industrialised countries which have only recently come to realise that there are limits to the earth's resources and its ability to absorb pollution.

East's natural environment is particularly finely-balanced and vulnerable because of its harsh climate, and one begins to appreciate the particular danger posed by rapid, uncontrolled growth. Conversely, the region's special situation gives it a chance – perhaps responsibility – to give a lead to the Third World by evolving new patterns of development, by learning from the mistakes and experience of the industrialised world instead of blindly copying it.

The extreme fragility of the natural balance in many parts of the Middle East is illustrated by its biggest and most pressing environmental problem: desertification, a word which has come to mean the loss of once-productive land under a variety of circumstances, only one of which is the onset of genuine conditions. Many environmental lessons

"Do we need a spectacular disaster to stir us into action to avoid catastrophe?"

are spelled out by the Arab world's experience of what is a worldwide affliction.

The global estimates and projections for this phenomenon are shocking. Recent studies suggest that around five million hectares (50,000 sq km) of cultivated land worth some $1.1bn is now being lost annually. Others conclude that half a tonne of vitally needed fertile soil is being eroded every year for every human being. Projections by the United Nations Environment Programme (Unep) indicate that, between now and the end of the century, the amount of cultivated land per person will be halved, even when allowance is made for land reclamation. It took a disaster – the Sahelian drought of 1973-75 – to focus modern attention on a problem which is now worsening rapidly after decades and even centuries of steady deterioration.

In Roman times, North Africa was the fertile granary of the empire, and glowing reports were written about the abundant fertility of Mesopotamia. Now North Africa is largely desert, while Iraq's saline soils provide some of the world's lowest crop yields. Estimates of global loss of croplands over history vary between nine and 20 million sq km, compared with the 12-15 million sq km currently under cultivation.

There are few accurate figures on how much land is being lost to desertification annually in the Arab world today, though Egyptian experts estimate that the amount of cropland per head of population in their country has dropped by half since 1930.

But Dr Ibrahim Nahhal, regional advisor on desertification, says there is no doubt that the desert is still inexorably advancing. "The Middle East is in a very critical situation," he says. "This is problem number one in our region, and it's getting worse all the time."

Despite much speculation that climate changes may lie behind the desert's advance, all the evidence is that the problem is created by its principal victim, man himself. "All the research done in the region has indicated that the climate hasn't changed radically since the fifth millenium BC." says Dr Nahhal. "All studies have concluded that the root cause of desertification in the Middle East is man's improper management in the utilisation of soil, water and vegetation resources."

In fact, the accurate way of presenting the picture is not to say that the desert is advancing, but that man is creating new deserts and pushing them to link up with the existing ones – and this at a time when population pressures make land loss more disastrous than ever. As Erik Eckholm of the Worldwatch Institute concluded grimly in his recent book *Losing Ground*, "Humans are – out of desperation, ignorance, shortsightedness or greed – destroying the basis of their own livelihood as they violate the limits of natural systems."

How is this happening in the Middle East? The causes are many, but one of the greatest – large-scale cultivation of marginal semi-arid rangelands – provides a classic argument for respecting and working with the existing natural balance. It also illustrates the danger of falling for short-term economic gains, and the extent to which even modest technology, unwisely used, can vastly enhance man's ability to damage his environment, sometimes irreversibly.

Mechanisation and the advent of the tractor meant that large tracts of this rangeland – with annual rainfall var-

"The root cause of desertification is man's improper use of natural resources"

ying between 100 and 200mm – could be ploughed up and sown with cereals or other crops which were not in tune with their environment, and which either failed or could only be cropped for one or two years. The net result was the destruction of the natural vegetation, which was in equilibrium with its harsh surroundings. With all ground cover

destroyed, the soil and its essential nutrients were subject to rapid erosion by wind and water, resulting in sterile conditions where hitherto the climate itself could sustain at least modest native vegetation.

This is just one of the ways in which land is being lost. Overgrazing and trampling by excessive numbers of livestock is another factor, deforestation another. Meanwhile, the fertility of well irrigated land is being progressively destroyed in some areas – particularly Syria and Iraq – because poor drainage means waterlogging and increasing salination. Unep estimates that over half the area of irrigated land in dry areas of Arab West Asia suffer from salinity.

The verdict that we are the culprits carries with it an element of hope, for if we are responsible we may be able to arrest and even reverse the disastrous trend. Some Arab countries are making considerable efforts to combat desertification, and these will be reviewed in a later issue of *Events*. But as Unep's Dr Nahhal points out: "We are still in the first phase of implementation, and we need time to see positive results from the measures taken." There is certainly a long way to go before the tide is turned.

The economic folly of short-sighted environmental abuse of this kind is relatively clear – and its results have been made painfully manifest. So it is not surprising that there is some degree of official recognition of the problem, and that governments see it as in their interests to tackle it. But the situation is far less clear-cut and the apathy much greater when it comes to more general development-linked environmental issues such as pollution and conservation, where there is no conclusive economic argument in favour of respect for the environment. On the contrary, there is a marked tendency to see environmental considerations in these areas as an unnecessary hindrance to development, particularly when they cost money without any noticeable return.

As well as being evident in day-to-day decision-making on development projects, this tendency to think in terms of "development versus environment" also surfaces in the Middle East's second biggest environmental problem area, the pollution of its three regional seas – the Mediterranean, the Red Sea and the Gulf.

Unep began focusing its attention on the Mediterranean shortly after the inception of this youngest and poorest UN agency at the Stockholm conference in 1972. There was a widespread fear that uncontrolled oil pollution and dumping of industrial and municipal waste might be killing the sea, which is virtually enclosed and only flushes out into wider oceans on a 70 or 80-year cycle, and even then leaves behind surface pollutants. Acting in its favoured role as catalyst, Unep brought the Mediterranean states (including Israel) together to discuss their common problem, and this led to the adoption of the "Mediterranean action plan" in Barcelona in 1975.

The plan included three legal agreements – a general convention for the protection of the Mediterranean against pollution, and two protocols, one for the prevention of pollution by dumping from ships or aircraft, the other covering cooperation in combatting emergency oil spill. It was another year before the agreements were actually signed, and two years after that they had only been ratified by the governments of six of the 18 Mediterranean states. Significantly, the swiftest concrete result of all the talk was the establishment in 1976 of an oil spill control centre in Malta. The Torrey Canyon and other major tanker disasters had underlined the dangers, and it clearly made sense to take out some kind of insurance policy against the risk.

But studies have shown that chronic oil pollution from daily operations –

"Plastic bottles and tin cans litter some of the most beautiful parts of the Arab world"

accorded a lower priority – are in fact a much more serious threat to the sea than accidental pollution, which represents only a minor contribution to the overall input. And the possibly more serious question of pollution from land-based sources has so far eluded agreement at the whole series of Mediterranean meetings, although a

protocol was worked out over three years ago. There is some hope that the agreement may finally be signed next year.

The delay reflects a clash of interests between the developing and the industrialised Mediterranean states, as well as a degree of environmental disregard on the part of the mainly Arab developing countries, led by Algeria. The latter are resisting pollution controls on their growing industries, for the simple reason that they cost money and would thus put their industrial output at a competitive disadvantage to that of the European states which provide the expansive pollution control equipment.

Unep is trying to persuade the industrialised countries to help developing countries by providing the equipment cheaply, but this amounts to asking them to help industrialise their market competitors. Interestingly, the issue did not arise in subsequent efforts to reach similar agreements in the homogeneous Gulf area, where the Arab states and Iran signed treaties in April this year pledging control on pollution from all sources, including land-based ones.

The developing countries' stand in the Mediterranean debate amounted to saying: "Let us industrialise first, and then come and talk to us about the environment" – an attitude which Unep and other concerned bodies, such as the Arab League's Economic, Cultural and Scientific Organisation (ALESCO), come across again and again in their efforts to foster "environmentally sound development."

"Ninety-nine per cent of thinking people here are development-minded, and only a handful are concerned about the environment," said one Arab ecologist. "If development is to succeed in the long term, it must take environmental considerations into account. Development and environment go hand in hand. The initial misunderstanding – that they are opposing factors – stems from the demands of industrialists or governments looking no further than the immediate future."

Environmental consciousness in the West is only recent and we can perhaps isolate two main reasons for its emergence. Uncontrolled pollution had reached a limit where it was rebounding on its authors in a way they could not ignore – smog clouds, mercury-poisoned fish, and a "silent spring," an absence of wildlife. Second, these societies had reached a level of affluence where the phrase "the quality of life" took on an aesthetic and spiritual dimension rather than a purely physical one. In other words, they could care about the aesthetics of their surroundings because they had achieved the basics of a comfortable life.

What environmentalists are asking of the Middle East and the Third World in general is to jump a stage which the western world went through over decades of pollution-ridden development. This is something new, and helps to explain why the environmentalists' task is so difficult.

"Let us industrialise first, and then come and talk to us about the environment"

"If we continue our industrialisation in the same style as the industrialised world, we will always be left behind," says Nadia Saad, deputy director of Unep's regional office for West Asia. "We are trying to evolve alternative patterns of development for the region and a new lifestyle, so that development is geared not just to increased production but to improving the quality of life of the people. Economists used to believe they were thinking long-term when they planned 15 years ahead, but we have to plan for future generations."

In practical terms, this means a continuous effort to persuade governments and decision-makers to take environmental considerations into account for the long-term good of everybody, and to convince them that environmental concern is not aimed at arresting development, but at keeping its impact on natural balances within acceptable bounds.

Apart from hostility and suspicion in some quarters, the main problem which the environmentalists face in this respect is sheer indifference and lack of awareness among officials as well as the public. In many Arab countries, for example, there are no restrictions on the import and the use of toxic pesticides, some of which are banned in their country of origin. Some maritime Arab states have no laws prohibiting the pumping-out of contaminated ballast- and bilge-water, and are thus attracting gratuitous pollution as well as buying it as a concomitant of development. In other cases, laws exist but are simply not enforced.

Official apathy may reflect a concern with more pressing problems. Lebanon, for example, may have to choose between spending money on improving its sewage systems or rebuilding destroyed villages. But it also reflects (and helps to shape) a massive indifference which Unep and others are trying to change through information campaigns, since public pressure groups are an important component in influencing government decisions.

Public awareness is also vital if environmental laws are to be obeyed as well as just enacted, since strict policing is rarely possible. At present, consciousness in most areas is very low. In Lebanon, which likes to think of itself as the most sophisticated Arab country, parents let their children swim in a sea sometimes so fouled that it looks like an undulating garbage dump. Which it is. Plastic bottles and tin cans litter many of the most beautiful and remote parts of the Arab world.

Perhaps these are aesthetic concerns which can be brushed aside in the rush for development. Perhaps it does not matter that many of the region's most interesting wildlife species have either been wiped out or are on the verge of extinction at the hands of motorised hunters with automatic weapons. But there are at least some concerned Arabs – and even a few rulers – who believe that environmental concern is indivisible. They are striving to save the area's natural heritage from oblivion so that future generations can enjoy it, in the belief that the aim of development is not just to survive but also to live a decent life. ■

CSO: 5000

DETAILS ON REFORESTATION PROJECT GIVEN

Safeguards for Forests

Addis Ababa THE ETHIOPIAN HERALD in English 4 Aug 78 pp 1, 5

[Text] "This national forest, that covers an area of 80 gashas or 3,200 hectares was mercilessly exploited by very few individuals and members of the discredited feudo-bourgeois ruling class, prior to the 1975 rural land proclamation."

This was stated by Ato Teshome Dammena, head of the Forestry and Wildlife Authority in Kaffa administrative region. He went on, it was named after a certain Bellete, who was a fugitive of the former government and took refuge in the forest.

It is known that such natural forests abound in Illubabor, Bale, Sidamo, Wollega administrative regions and generally in Southern and Southwestern Ethiopia. Other such forests in Kaffa are Tiro and Gera forests it was learned.

Ato Yewend-Wosen Tsigie-Mariam, public relations officer of the Forestry and Wildlife Authority also noted that, in the natural forest the old trees are cut down and replaced by planting new ones. This prevents the loss of the smaller trees that are crushed in case the older ones fall on their own. Ato Dejenie Gezahegne, the workers' representative also indicated that, since 1975, an area of four *gashas* or 160 hectares of land has been planted. The tree seedling include 13 types of eucalyptus, one local and 4 foreign types of cedar. He further noted that, prior to 1975, the trees were cut indiscriminately by the self-centered exploiters.The masses around here were not allowed even to cut a branch. At present, the indiscriminate cutting is replaced by controlled cutting.

The workers' representative continued that there are 337 workers, of which 60 are permanent and 277 are seasonal, and due to the nature of the work, they are not organized. There are guards to safeguard the forest from being cut down. If anybody is found cutting a tree without perimission, he would be held and reported to the nearest peasants' association. Let alone cutting down trees, they even do not allow people around there to hang bee-hives in the forest.

Ato Yewend-Wosen explained that, if a bee-hive is hanged, that means the time honey is ready, the owner has to come with something smoking to drive away the bees inorder to get the honey. Negligence might occur and result in fire in the forest.

Reserved for the Rainy Seasons

Since the forest is on an all — weather road, there is no transportation problem, Dejenie further noted. Therefore, the forest is used as a reserve. It is learned that there are about 500 peasants who have settled in the middle of the forest. The is an attempt going on to arrange with the Settlement Authority to settle these people to some other places.

Ato Dejenie also said that the peasants relate they had bought the piece of land from the former owners. This shows how the capitalists were merciless to the forest.

Asked if the workers there had any problem, Dejenie said earlier they did not get salary on time, but at present, there is no such problem. The only problem is that of monkeys and rats. The monkeys jump on the trees and then either bend or break them. The rats bite off the barks of the trees, especially cedar trees, and this leaves the trees dry.

Of the trees in the natural forest, "Kerero" and "Tiquor Inchet" (Black Wood) are dominant. The "Kerero" could not be planted and grown from seedlings unless it naturaly grows on its own. Therefore, the "Kerero" must be handled with much more care, Dejenie concluded.

Reforestation in Adeola

Addis Ababa THE ETHIOPIAN HERALD in English 5 Aug 78 p 6

[Text] About 1,300 youngsters, kebele office-bearers and members of the revolution defence squad of Higher 1 launched a day-long afforestation campaign Thursday in the vicinity of the town of Adeola, Zuqual district 90 kms south of here.

The campaign which was sponsored by Higher kebele [in italics] 1 was organized with the aim of simultaneously engaging the youth of the area in development activities and arresting the decimation of the country's forest resources.

Dynamic Force

During the day-long intensive plantation campaign, about 21,000 seedlings were planted on a vast tract of eroded land.

In a welcome speech, the chief of agricultural development in the area thanked the campaigners for their genuine dedication to participate in this constructive and worthful endeavour. He said that the now-discredited feudo-bourgeois regime and the members of the aristocracy had not only exploited the labour of the broad masses; but also the natural rich wealth of the country. He said that the forest potential of Ethiopia, which have been indiscriminately destroyed in the past should be replaced by launching similar large-scale afforestation campaigns.

In a brief statement, Comrade Ergete Medibew, chairman of Higher kebele 1 said that the youngsters who were hitherto misled by the counterrevolutionary machinations of the self-styled Trotskyte EPRP have now joined the revolution's camp.

The youngsters who are the new dynamic and energetic force of the revolution are unreservedly participating in the bitter class struggle, which is presently being waged between the revolutionary and reactionary camps, Comrade Ergete stressed.

During the campaign, members of the peasants' and women's associations have also participated in the plantation campaign.

Swedish Ambassador Praises Efforts

Addis Ababa THE ETHIOPIAN HERALD in English 8 Aug 78 p 3

[Text] **Swedish Ambassador, to Revolutionary Ethiopia, Mr. Bengt Friedman, said that the masses are doing a great job in the nation-wide afforestation campaign and added that he was highly impressed by the enthusiasm of the broad masses.**

The Ambassador also stated that since afforestation could not be carried out only by a single institution, participation of the masses is indespensable, and that he is glad to see this taking place here.

In an on-the-field interview during afforestation campaign in which 6 institutions with a total af about 1,500 people participated the Ambassador disclosed this to a group of journalists Sunday. Participants were from the Ethiopian Postal Service, Vaskin Wood Industry, Ethiopian Roads Authority, Higher 3 youth, Rift Valleys Agricultural Development Authority, and temporary employees of the Rental Houses Administration.

It was further pointed out that the last group of participants took part in the campaign on their own initiative, and although they were unable to get aid from the institution they work in, they contributed money and hired buses to come to field. Later, they were driven back to Addis with the authority's vehicles, it was learned. During the day-long campaign, thousands of holes were dug on an area of about ten to fifteen hectares, and more than 20,000 seedlings were planted on about eight hectares.

Mr. Gote Lidvall, the Swedish coordinator in the Forestry and Wildlife Authority stated that, people must be

educated about importance of forestry and the use of forests and the teaching must begin in schools. Mr. Lidvall added that, there are twenty Ethiopians studying forestry at the Wondo Gennet, Forest Resources Institute and it is hoped that the number will be raised to thirty during the coming year. Speaking about the Swedish instructors, he said that the lecturers at the Institute have taught 20 to 30 years in various parts of Africa and have broad knowledge of the subject matter.

Asked about the condition of trees brought from Sweden and planted here, the coordinator said that, the trees grow here at a tremendous rate. It takes them 50-60 years to fully grow in Sweden, whereas, it only requires thirty five years here. Eucalyptus grows, in Sweden in fifteen years time while it takes only four years here, it was stated. Wollo and Tigray regions were pointed out as areas that need urgent and massive afforestation campaign.

Ambassador Friedman further noted that, the Swedish Government has similar programmes to launch afforestation campaign in Tanzania, Zambia, and in Mozambique. In conclusion he said that, good results are obtained in Ethiopia and added that the largest project "is of course the lumber project in Vietnam".

--- *Staff Reporter*

CSO: 5000

PROBLEMS OF THE RIVER OM'

Missing Link

Omsk ZEMLYA SIBIRSKAYA, DAL'NEVOSTOCHNAYA in Russian No 1, Jan 78 pp 60-61

[Article by I. F. Odintsov and V. A. Motovilov, outside correspondents]

[Text] The kolkhozes and sovkhozes of Priom'ye are rich in wheat fields and fat herds. They produce hundreds of thousands of tons of bread, meat, and dairy products. The water resources make it possible to look at the development of the farms from another view point. It is known that where there is water-- there is fish. What is the attitude here towards this problem?

We travelled from the mouth to the middle of the course of the Om' and were convinced: the villagers do not have enough fish to eat even for themselves. Conversations with the directors of the farms, local soviets, and party workers revealed a single opinion: fishing is not an obstacle to anyone. The demand for fresh water fish is great, and the conditions for catching it are present in practically every riverside village.

The enormous branches of the oxbow lakes, the deep ravines, valleys and channels stretch for kilometers along and across the floodplain joining with the vast gullies which cut the high river banks. Nature as though was concerned whether man without special difficulty could benefit. But the flows of snow and rain water so necessary to the dry valley coast uselessly flow down the slopes, remove from the fields thousands of tons of fertile soil, erode the gullies, and fill in the riverbed. Stop and retain this mass of vernal floods, and you will soak the soil with moisture, the surrounding air, and the currently barren hectares will be covered with succulent grasses.

"And stock such reservoirs with fish, " dreams out loud the chief agronomist of the Ust'-Tarskiy rayon production administration of agriculture of the Novosibirskaya oblast, V. P. Noskov. But he sighs, "But something does not turn out for us."

Many specialists with whom we had to converse are worried about the annual increase in salinization of the riverside soils. They know that one of the methods for avoiding this predicament--creation of fishing ponds with the organization of crop meadows and pastureland. Here is how the interlocutors themselves speak of this.

"We don't have the fish," the chairman of the kolhoz "Oktyabr'" of the Kormilovskiy rayon of the Omskaya oblast S. N. Bandur admits.

Summer has arrived and Semen Nikitich is concerned that the hay does not spoil under the rains. For the sown grasses have been raised by the kolhoz members with such love on the irrigated fields!

"There is a great desire to raise fish," states the director of Khomutinskiy sovkhoz of the Omskaya oblast G. L. Garanin. "We have already put carp into the lake. The only trouble is that we do everything blindly: none of our specialist know what the fish need and how to keep them."

"We do not have any specialists that know this, " also grieves the secretary of the party committee of the Kozinskiy sovkhoz of the Novosibirskaya oblast A. Ye. Plaksin. "Here in this lake," indicated Arkadiy Yegorovich at the enormous horseshoe river oxbow lake spreading over the central farm, "already once they have put carp. But all of them died."

He was silent, thinking about something, and concluded indecisively:

"From that viewpoint a reservoir is somewhat better for the village. Insignificant outlays, and you will pull in cases of living silver."

Today it is not necessary to convince either the farmer or the party leader that pond fishing is a necessary and profitable affair. There is already a very graphic example in the sovkhoz "Razdol'nyy" on the Altay, where a blue hectare of previously unusable area provides pure profit 5-10 times greater than a hectare of the best pasture land. Thousands of hectares of drained ponds produce a perceptible profit also in other Siberian farms. The question of resources is not a problem today. But there are no specialists, therefore such a situation exists not only in the Kozinskiy and Khomutinskiy sovkhozes. For example the heavy carp went out into the Om' from the primitive reservoir in the Sherbakovskiy sovkhoz of the Ust'-Tarkskiy rayon of the Novosibirskaya oblast. Many times attempts were made to stock the small flood plain rivers by certain farms in the Kalachinskiy and Kormilovskiy rayons of the Omskaya oblast. This valuable branch of agricultural production has not taken root anywhere.

Fishing in Siberia is a new and rather troublesome matter. Moreover it is not known whether it will bring profit to farming or not. For a number of important officials, unfortunately, still have the tenacious viewpoint that pisciculture is recreation.

"There is no plan for the fish. This is not grain or meat, and not milk," we were told by almost every director of farms or rayons. A lot still remains in the consciousness of the Siberians of the century-old idea of fish as a natural gift. Is that not why in Ust'-Tarka, although modestly, they told us:

"We mainly catch Crucian carp. But now they have made the lakes shallow, and the people near the Om' have overrun the area so we have been forced to go fishing in the Vengerovskiy rayon."

And the people of Ust'-Tarka go to Vengerovo, while the people of Nizhneomskiy those of Kalachinsk, and Kormilovka go to Ust'-Tarka. They go although they repeat over and over in one voice that the condition for fishing on the Om' are excellent for all.

"Amateur fishing should be encouraged in every way and assisted by the stocking of lakes," convincingly states the head of the Nizhneomskiy rayon agricultural administration of the Omskaya oblast I. N. Mikhaylyuk. "But they do not give us stocking material. They say the ponds are not draining."

"The directors of the farms have an amazing pull towards amateur pisciculture," says with surprise the deputy director of the production association " Omskrybprom" K. S. Anponova. "They go and almost all beg for the Amur Crucian carp because it is good to catch on a fishing rod."

The systemless fishing of the "lovers" of lakes, and at times the incompetent use of toxic chemicals and mineral fertilizers on the fields have destroyed them. Some understand this, and are making modest attempts to revive the lakes by stocking them with fry of valuable fish. This is not bad. But amateur fishing nevertheless is not commercial production, and it cannot satisfy even the intrarayon demand for this product. Large kolhozes and sovkhozes farm on the shores of a large river which from the Vasyugan'ye itself brings them its waters, but they do not completely use this great natural gift: they underproduce for the people many tons of good quality products.

But how in these krays do they think to respond to the resolution of the CPSU Central Committee "on the organizational work of the Tyumen' party obkom for mobilization of production collectives, scientists, and specialists of the fishing industry to increase in the reservoirs of the oblast the supplies of commercial fish and their better use"? How do the neighbors of the people of Tyumen' plan to introduce their experience? They could not show us any plans or projects. But here and in another place, in the Kraznozerskiy rayon of the Novosibirskaya oblast located considerably to the south of Priom'ye we obtained an answer to our questions.

The sovkhoz "Sibir'" of this rayon also farms in the flood plain, only considerably smaller than the Om', the river Karasyuk. Four years ago at one section a small pond farm was created. And already in 1975 12 centners of fish were obtained from a hectare of their "blue virgin soil." This year more than a million home-grown fry have been produced. Today in the farm a spawning ground, nursery, fattening, and wintering ponds are operating.

All this has been created due to the energy of honored agronomist of the RSFSR, the director of the sovkhoz I. Z. Novichikhin. His enthusiasm met a response among his collective and in the rayon. This interesting and useful proposal was supported by the first secretary of the CPSU raykom, Hero of Socialist Labor V. I. Korobeynikov. The initiative of the people of Kraznozerskiy was approved by the obkom of the party and the oblispolkom [regional executive committee].

Now in the sovkhoz a plan is being realized for the construction of pond farming of the first phase costing 1.5 million R. Over 800,000 have already been accepted by the Krasnozerskiy PMK trust "Meliovodstroy." With the completion of the construction of the entire complex the sovkhoz

will have 1,500 ha of fishing ponds, and will produce 2,000 T of fish per year. Speaking of the future of pisciculture the head of the rayon administration of agriculture I. E. Aksent'yev convincingly announces:

"We are for the production association."

"Interfarm relationships," the sovkhoz pisciculturist V. T. Zonov repeats, "will intensify our potentialities. And if the neighboring reservoirs are stocked with fish one can fish under the ice and the workers will be involved in production year round." The sovkhoz thought beforehand of the training of specialists. A number of scholarship students are studying at the institutes. The farm has permitted its pisciculturist to become familiar with the experiments of the best farms involved with obtaining commercial fish. Vitaliy Tikhonovich has also visited the Tyumenskaya oblast. In order to develop industrial pisciculture in natural reservoirs hydrological studies are necessary, and often laboratory data to solve unexpectedly developing problems are necessary. But the laboratories, like the residences for the workers and the specialists, is the second phase of construction of the ponds, and there are still no plans. The pond farm needs, for example, powerful pumps and other mechanisms, fishing tackle, special feed...but where to get their nonexistent legal organization? The workers of the sovkhoz "Sibir'" are going to search for that which is needed. For this reason they received the food for the fish a whole month late, and these are lost tons of valuable product. And there are still lots of other troublesome questions for which the farmer involved in grain and meat and dairy production does not have enough time!

The legal formation of an interfarm association would accelerate the solution not only the aforementioned questions, but also a number of other no less important ones in organizational respect.

The river Om' is a large body in the state water management. And in its nature the water management of the country is generally complex. The diversion of the waters of this river merely for everyday needs and for irrigation far from meet the requirements of the complexity of its use. A very important link--production for the population of a valuable protein product--fish falls from the sphere of economic activity.

Amateur pisciculture already proved in the examples we gave its unsoundness. Commercial pisciculture on the Om' requires only an industrial basis and str ct specialization. Specialized farms not associated with other concerns could more successfully overcome the developing problems. And most important, they could with great economic effectiveness conduct intensive pond production, by also using the lakes for one year fattening of rapidly growing fish species. For this purpose the reservoirs existing in the valley of the river are suitable, while the drain ponds can be constructed in a short period for the riverside flows, deep ravines and gullies. They can easily be filled with water at anytime and rapidly emptied with the realization of the product.

In an organizational respect, in our opinion, this is in the power only of the interfarm association, which will work on the reservoir of the riverside farms. It is easier for the kolhozes and the sovkhozes through such cooperation to unite their forces in the construction of a pond farm of the optimal dimensions, for the introduction of new technology, and the use of more progressive forms in the organization of production.

One can object: In each oblast associations of the "Rybprom" are operating, why create new ones? We will listen to the representatives of the pisciculturists themselves on this account.

"In our Podstepkinskiy pond farm 500 ha in area in 5 years the production of carp has increased more than tenfold," states Klavdiya Stepanovna Antonova. "But the fish ration of the village has almost not increased. We supply the pond fish to the main plant collectives of Omsk which give us help. In order for every villager and all the townspeople to have fish the kolkhozes and sovkhozes must themselves be involved in this." We attentively examine the intricate incubation system and are still more convinced: this is troublesome work only for the specialized interfarm association where the important role will be played by the specialists of high qualification.

Shoaling

Omsk ZEMLYA SIBIRSKAYA, DAL'NEVOSTOCHNAYA in Russian No 2, Feb 78 pp 59-60

[Article by I. F. Odintsov and V. A. Motovilov, outside correspondents]

[Text] The Om'. How little water there is in its high gully-swamp shores. We are standing with the head of the Kalachinskiy production administration of agriculture A. P. Danilov at the irrigation water intake, and we see exposed pumping pipes. The mind persistently turns to the characteristics of the Om' read the day before in a geographical statistical dictionary for 1867: the river has sloping banks and is fairly full of water, with a width from 30-42 sagenes and depth up to four meters. "In spring the Om' overflows strongly, drowns the coastal meadows, and at this time along it from the mouth of the Tartas float up to 2,000 rafts of timber: cedar, pine, larch, birch, asp...the fall of the river is very slight, and the current slow." But now...

"It is catastrophically becoming shallow," breaks the silence Aleksandr Pavlovich. "The Om' urgently needs the Irtysh water."

I glanced at my companion. Thickset, bare headed, sympathetically suffering look, concerned frown--he was very much like a doctor at the bed of a serious patient.

"This means only an 'infusion.' Is there no other salvation?"

"Only," he answered with assurance. "It is necessary to force this project."

The idea of diverting Irtysh water to the Om' was publicized through the newspaper OMSKAYA PRAVDA 5 May, 1972 by Doctor of Geographical Sciences D. N. Fialkov. And here we are in his department of engineering geodesy of the Sib ADI [V. V. Kuybyshev Siberian Highway Institute].

"It goes without saying," says the professor, "the direction of the Irtysh water along the rivers Achairka and Tarbuga into the Om' not only will make it deep, but also will irrigate 40,000 ha of land of the interfluve."

"It is planned to empty the water of the Ob' along the Om' with a "turn" of the Siberian rivers into the Aral steppes," reassuringly also informs us the honored scientist of the RSFSR, professor of the Omsk agricultural institute V. S. Mezentsev.

Large scale plans. But nevertheless they cannot dislodge the concerns of the farmers. And they can hardly dislodge them, because they are directed towards the causes, that is the actual shoaling of the river. But they do not touch at all the reasons for this catastrophe. And the reasons are so diverse and so strong that they uncovered not only shoals in a once deep bed, but also produced degradation of the entire river basin. "The ridges are losing humus," we are obliged to hear many times from the workers of field crop cultivation. This phrase was also dropped by A. E. Denilov in our conversation when speaking of water and wind erosion of soils of Priom'ye.

Our boat touched the massive pontoon where powerful pumps are at rest. These drink water from the river and spill it a rate of 510 liters per second to the vast fields of the drowned river valley irrigation in the sovkhoz "Uval'skiy" of the Tatarskiy rayon of the Novosibirskaya oblast. Such a complex is the first on the Om'. But judging by how joyfully the specialists of other farms respond to it, it is necessary to think that this progressive method of stable fodder production will take root for them also. A similar irrigation system is already being constructed in the neighboring Sherbakovskiy sovkhoz of the Ust'-Tarka rayon of the Novosibirskaya oblast, and the people of Nizhneomsk are also talking about the same.

At the pumping units the attendant A. I. Klimenko is anxiously examining his marks on the muddy washout. He is concerned with the rapid fall of the water:

"Summer has not been here for 10 days and the water is dropping! Another week and the diversion will be empty. I cannot think how to pump to the second irrigation."

He glances questioningly at us, then turns a side glance towards the steep slope where the grazing herd appears variegated. The hot sun scorches the earth, on the bare coast the dwarfed vegetation has become yellow, the young crops have languished and drooped, and on the high shores beaten down by the cattle dust columns are billowing. And the earth, and the green

fields, and the pastureland--all need water. For it enormous yokes of water intakes have been stretched to the Om' from nearly all the riverside farms, and their number is increasing with each year. The peculiarity of the aridness of the Siberian summer, and the possibility of increasing the products of plant growing have included this small river into the technological chain of agricultural production. Thus the Om' in the national economy has become a river that is not at all small. Over 120 settlements in 10 rayons of the Omskaya and Novosibirskaya oblasts are gifted with its waters. Its catchment area occupies half of the entire area of the lucrative Baraba. And if one takes into consideration that on the lands of the Ob'-Irtysh flow are located more than a quarter of the country's workable plowed fields, while the Barabinsk steppe is actively drying up, then the role of this so-called small river is inestimable.

"Two crops of brome grass on the irrigated lands gave us over four tons of excellent hay from a hectare," the chairman of the kolkhoz "Put' Lenina" of the Kalachinskiy rayon G. S. Nechipurenko confirms this thought. Gennadiy Sergeevich smiles contentedly and we understand his mood. For from this, "still yesterday" unirrigated land the kolkhoz with difficulty scraped up only a tenth of this. All the farms on the irrigated Priom'ye receive a considerable supplement. In providing fodder to the growing livestock the specialists place great hopes precisely on the irrigated pasturelands and hay meadows. But the debit of water is small, and its level in the river is dropping with each year.

Back in 1941 the high waters in the Om' almost reached the 11 m mark. The drop lasted in the middle and lower courses to the middle of September. But now already by July its level has dropped almost to the low line. The period of such water shortage has lasted with insignificant fluctuations since 1953. The hydrological pattern of the river has been destroyed. The climate factor and human activity are the causes in the opinion of scientists, and in particular Doctor of Geographical Sciences, Professor Mezentsev.

It has been established that 10,000 km^2 of deciduous forest give back to the rivers during a year 0.3 - 0.5 km^3 of water, while the same area of taiga and more--up to 0.8 km^3. The deep water of the river Om' lowland came from the vast swamps and forests. As early as the 18th-19th centuries, according to the testimony of contemporaries and researchers, along the entire right bank of the Om' beginning from the mouth indigenous birch and asp forests grew. And ensign Uksusnikov who marked the route for the road through Baraba in 1755 reported to the authorities that "there are many uninhabited places for settlement along the Om' river where there is sufficient birch forests suitable for construction and fire wood." Twelve years later this was confirmed in the descriptions of the Barabinsk steppe by the head of the engineering expedition General Malm. (A.D. Kolesnikov, "Russkoye naseleniye Zap. Sibiri 18th-19th vv" The population of West Siberia in the 18th-19th centuries Zap.-Sib. Kn. Izd., 1973).

Since under the cover of the forest "the ratio of the quantity of precipitation to the quantity of evaporated water is greater than a unit" (Vtorov and Drozdov, 1976), the right tributaries, judging by their deep channels

and wide shores, collected in their wooded basins the abundance of the excess water and filled the parent river with them. Now both the Tarbuga, and the Achairka, and the Tarka have essentially died like the tributaries.

The riverside birch groves that have become settled with farming activity have grown thinner. The average extent of the forests in the lower Priom'ye now only equal 9.5%. Other figures are also stunning.

"If one excludes the swamps located in the basin of the Om'," states Professor Mezentsev leafing through bulky references, "then our plowed fields comprise 70% of the water catchment area, and the extent of forests--only 20. Only in the Novosibirskaya oblast from 1935 to 1968 360,000 ha of Om' swamp flow were dried...

Of course for a river of swamp origin which is fed by means of precipitation and primarily snow, this could not occur without any trace. From here it is evident: a gross violation of ecological interrelationships in the Om' basin also resulted in its shoaling. For the Om' according to the annual distribution of water is a river with a dominance of a spring flow. The systemless reduction in forests in the riverbed shore, in the upper reaches of the river, and in its tributaries, in the ancient ravine and gully-swamp sections, the replacement of the natural vegetation on the slopes with crops, and the plowing of the shores eliminated the possibilities for the accumulation of waters of the spring flow in the water intake, increased evaporation, and finally intensified the wind and water erosion of the soils, and resulted in silting of the bed.

Now we are witnesses of a sad spectacle. Since the start of spring the flows of snow melt water with nothing to hold them rush down the slopes thus washing away and carrying off valuable humus and colloidparticles of the soil. The river swells, and with a strong current undermines the shore thus forming slides and heaps, and crumbling the soil from the riverside terraces.

Along the entire course of the Om' from Ust'-Tarka to Omsk we observed many traces of water erosion. Only on the territory of the Nizhneomskiy and Kalachinskiy rayons we counted over two dozen growing coastal gullies, and almost as many new heaps and slides. There are many fresh washouts and gullies on the pastureland in the settlements of Potanin, Zotino, Polovinka, Andreyevka, and Novomoskovka. According to the testimony of candidate of agricultural sciences Y. R. Reyngard who has studied soil erosion in the lower Priom'ye the high shores of the river are a special concern. They are exposed to wind and water erosion in the 1.5 km strip along both sides of the riverbed, and gullies are formed even 7-8 km from the Om' along the slopes of ridges and ancient hollows.

"According to my calculations," states Yakov Romanovich, "individual hectares lose up to 150 T of fertile soil a year."

A lot of it is washed into the river by downpours and spring deep water. According to the data of the Omsk administration of the hydrometeorological service (P. V. Borisov, 1968), the annual removal of the flow of suspended particles at the city of Kalachinsk equals 210,000 T, and in 1947 it reached even 630,000. If one takes into account that at Kuibyshev this volume is only 28,000 T, then it is easy to be convinced how the degradation of the soil is progressing towards the mouth of the Om', that is in the lower portion of its water catchment area. Precisely here is the most modest percentage of forestation. It is difficult to overestimate the protective importance of the forest in which the soil does not freeze through as much, the melting of the snow is three weeks longer, and the "dying" land rapidly absorbs the snow melt water. The forest retains also the surface flow of downpours, and transmits it within the soil. And as science has proved this reduces the danger of flooding, and maintains the deep water in the rivers which have filled during the summer with underground water.

But the rivers which only with 25-30% of the total territory can play the optimal water saving and water regulating role have been seriously thinned out. Swamps--these unique sponges which in the "wet" year absorb the excess moisture, and in the "dry" years give back to the rivers, have been significantly dried up. The gully-swamp ravines where the underground waters come to the diurnal surface, as well as the shores of the reservoirs are exposed--intensive evaporation is occurring. It is known that every 10% of wooded area governs the fall into this region of 4% additional summer precipitation (Vtorov and Drozdov, Moscow, 1976). And we curse the drought which in the Siberian forest steppe generally covers the first half of the summer for doing enormous damage to the harvest!

Plants require a lot of water during the vegetative period. It can be taken from the spring flood water. Until the July rains it is capable of maintaining the moisture in the soil and of filling the reservoirs. It is necessary only to turn the surface flow into an intrasoil flow where underground waters will be accumulated, and then the river sources will be stopped up. Thus we see that filling the Om' with foreign waters from other rivers will do little to change this. Water and wind erosion will continue to do immeasurable damage to the riverside soils that have been exposed by farming. This is why today the problem of the water content of such an important river in agricultural production cannot be separated from the problem of preserving the fertility of the soils of Priom'ye. Their solution is possible only in a complex since the river and the lands adjacent to it comprise a single, living natural organism.

We have named many consequences of the development of the Om' basin against the laws of life of this organism--shoaling of the river, erosion of soils, and so forth. We will only stress that to farm without considering nature is fatal not only for it but primarily for we ourselves. In the upper reaches of the Om' the swamps have been dried, and it is planned to turn them into plowed fields. The river thus will be deprived of a water source. However: "of the 360,000 ha of dried swamps," states Professor Mezentsev, "300,000 have lost their agricultural value." "After drying they are rapidly

converted to solonchaks unsuitable for use since many of our swamps are located in solonchak depressions," Doctor of agricultural sciences N. Z. Milashchenko completes the characteristics. "Of course, this could be avoided, if the question of the use of the raised swamps was decided not only by the engineers and land developers, but the scientists of different professions who would determine the most rational means for the development."

And so it is quite evident that without a knowledge of the natural interrelationships between the river, the forest, the soil, and so forth, without the development of the further farming activity of scientific recommendations based on such knowledge, concentrated, say in a single general plan for the use of the river and the adjacent locality, we will not win the crisis of the Om' basin. It is evident further that the initiative in the development of such a plan can only be based on the ispolkom of the soviets of the of the Novosibirskaya and Omskaya oblasts, for control over the rational use of natural resources has been placed by our legislature on the Soviets of People's Deputies. Only they have the power to unite in solving this problem the specialists of different fields of science: soil scientists, hydrologists, biologists, foresters, economists, sociologists, and so forth in order to make a comprehensive study of the question of a complex scientifically justified use of the entire Om' basin.

In solving such a problem we already have important experience. The interoblast committee for Desna in the Bryanskaya oblast has approved the resolution of the RSFSR Council of Ministers "on the work of the soviet and water management organs of the Bryanskaya oblast for the protection and rational use of water resources" of 24 May 1977. In the Orlovskaya oblast the sovkhoz "Saburovskiy" together with hydraulic engineering measures has afforested the gullies, ravines, and slopes, having created on a scientific basis new soil-protecting and water-preserving forests. And the fields have begun to give harvests 2-3 times higher than before.

The critical situation on the Om' also requires such an approach.

Spots on the Water

Omsk ZEMLYA SIBIRSKAYA, DAL'NEVOSTOCHNAYA in Russian No 3, Mar 78 pp 60-61

[Article by V. A. Motovilov and I. F. Odintsov, outside correspondents]

Text In the previous publications (No 1, No 2, 1978) we raised the questions of the rational use of the Om', increase in its water content, and preservation of the fertility of the soils of the Priom'ye. The cleanliness of the river water for the people of the riverside--a no less important problem of today. Now the entry made 110 years ago in the geographical statistical dictionary will produce an ironically sad smile in each resident of Priom'ye: "...the locality along which the Om' flows consists of excellent meadows that alternate with picturesquely grouped groves of deciduous forest." Or: "There are many hay meadows along the Om'."

Now already at the beginning of summer instead of excellent meadows and hay meadows the river meadows barely covered with sparse vegetation and many pasture weeds are yellowing and are accessible to all the winds. And the thinned and for the most part pitiful choppings trampled down by the grazing cattle do not have even the remotest resemblance to those "picturesquely grouped groves " that not so long ago crowned the former beauty of the magnificent meadows. The wild fauna has also become impoverished. All of this is a result of human activity in the process of which contamination of the environment occupies a prominent place. The opinion still exists that the self-cleaning capabilities of nature are limitless, and the river can easily cope with any harmful effects on it. We will see how it copes.

From Omsk to Ust'-Tarka there is not one population point which is satisfactory in sanitary conditions. One can see, for example, neat and cleanly swept village streets, but there is a lot of garbage in the settlements on the side of the river, and mountains of manure in the villages and countryside of Kozino, Chernyavino, Kirshovki, Staryy Revel' and others. A. M. Tint of the kolkhoz "Pobeda" of the Kalachinskiy rayon of Omskaya oblast has spent his whole life near the Om';his farm has been built on the 20 m shore. He, like his neighbors, dumps manure and all domestic wastes from the steep shore towards the river:

"We have been filling the shore for as many years as we have been living--the water will wash away everything."

This is how not only the ordinary workers behave, but also the directors and specialists of farms. On the shore there are the animal husbandry farms of the Starodub section of the Kuybyshev sovkhoz (Omskaya oblast), the fattening sovkhoz, and the sovkhoz "Kozinskiy" of the Ust'-Tarsky rayon of the Novosibirskaya oblast. The manure accumulated during the winter is not removed either by the spring or by the summer, it lies for years. During the thawing of the snow or during rain turbid, reddish flows fall into the river. And in the village of Bogdanovka, where the Kormilov fattening sovkhoz is located, and in the Tavlozhan brigade of the kolkhoz "Put'Lenina" of the Kalachinskiy rayon of the Omskaya oblast principle buildings and cattle pens appeared quite recently. During the summertime here animals from the healthy herd, as well as from defective graze on the shore and come to water.

In the middle of the 1960's in Kalachinsk a dairy plant was put into operation. It was planned that the waste waters would go out onto the fields of irrigation, while the water that enters the coolers will be returned clean to the river. Now the sanitation system operates as such that fields of the Kuybyshev sovkhoz have been removed from crop rotation. And into the Om' daily over 100,000 m^3 of "conventionally clean" water are deposited, in which the degree of contamination with fats and other organic additives is 10 times higher than maximum permissible sanitary norms. The enterprise does not make laboratory analysis of the water.

Petroleum products are the most harmful contaminants, and their content in the river increases each year. Very recently at the actual river the Kalachinsk motor transport enterprise No 4 of the system "Transsel'khoztekhnika"

was set up, however the territory here has already been cemented. The drains have not been equipped. Often the treated oil is poured out directly onto the ground and is carried by flows into the river.

Irrigated lands today are the pride of farms. But the farmers of these systems have little concern for the cleanliness of the river water. We examined several tens of water intakes along the course of the river, but we did not see the proper order at the pumping stations.

"What is so dirty here?" we asked the motor mechanic of the pumping station of the Petrll'ichev sovkhoz of the Nizhneomskiy rayon of the Omskaya oblast A. Zhukov.

"Fuel remained for the winter in the tank, water fell, and in spring it poured out onto the ground," he cooly answered.

No one is bothered by the fact that at the pumping station the pipeline from the cistern to the motors has a poor hermetic seal, and solar oil streams along the slope. The drip pans of the motors are overfilled, and mazut spots float along the water. This would not have occurred, if the land developers had a strict material accounting for environmental protection and saving of fuel and lubricant materials. At the end of October of last year in the mouth of Om' the water for an entire week was covered with multicolored separations of petroleum products. This is how the land developers ended the season. The damage had been done to the river--the dense hydrocarbon film blocked the access of oxygen to the water right before the freeze-up. And then it went to Irtysh...

Extensive damage to the flora and the fauna of the river is done by toxic chemicals used in the farms. Flows of snow melt and rain waters carry from the coastal fields toxic substances into the river, and in it destroy whole communities of aquatic plants, fall into the plant and animal food, poison the fish and the birds, and pollute the water, which is categorically forbidden by the water code of the RSFSR (article 97). The farmers of the farms do not always have a prudent attitude towards the protection of the water resources. On the fields of the Kulikov sovkhoz of the Kalachinskiy rayon which is adjacent to the river several years ago after the use of herbicide the leaves of the trees of the forest strips and the birch cuttings were burned. Traces of the harmful effects are visible even now, but such a method of using strong substances has not been condemned. Herbicides are used near the river even now, even on irrigated lands from which streams of water fall directly into the river. In 1978 it is planned to use herbicide in the sovkhoz "Kulikovskiy" on irrigated lucerne. Therefore it is extremely necessary in each region to have a legalized scheme for forbidding the use of pesticides in the flood plains of the rivers, lakes, swamps and ponds. We are not speaking of a production reservoir, but of a source of drinking water.

Can the cleanliness of the river water be protected and its taste qualities improved in the near future? As early as 1961 in his candidate dissertation defended at Omsk Medical Institute D. N. Tarasevich on the basis of river

waters for the saturation of the microorganisms proposed setting up a sanitary zone of a second belt for protecting the river. The author of the dissertation considered it expedient to permit grazing of cattle no closer than 200 m from the shores, and to forbid watering directly from the Om'. But these recommendations as yet have not been taken into consideration.

In the USSR the largest water catchment area of the Ob' is 2.930 million km^2. A part of this magnificent natural gift is the river Om'. A part which we see is far from being clean... Our article "The River is Shoaling..." (No 2, 1978) raised the question of creating a general scheme for the rational use of the Om' basin, which would be the same for the Novosibirskaya and Omskaya oblasts. The cleanliness of the river, strict sanitary control of water intake and water discharge--this, in the opinion of the public, is one of the important aspects for the development of such a system.

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WIND TUNNEL NEEDED FOR POLLUTION RESEARCH

Tallin SOVETSKAYA ESTONIYA in Russian 20 Jul 78 p 2

[Article by V. Gendrikson, senior research associate, Institute of Thermophysics and Electrophysics Academy of Sciences Estonian SSR: "Wind Tunnel Needed for Air Pollution Research, Architectural Design"]

[Abstract] The author states the case for a research wind tunnel in the Estonian SSR. Despite the lack of an aircraft industry in the republic, such a tunnel would be of use to Estonian scientists and specialists for simulating air currents close to the earth's surface. The aeromechanics section of the author's institute, reputedly one of the country's pioneers in the use of physical modeling methods for solving air pollution problems, has been using a small wind tunnel not intended for that type of work. A wind tunnel is needed for other projects in city architecture and design of industrial buildings.

In a comment following the article, Doctor of Technical Sciences I. Epik, vice-president of the Academy of Sciences Estonian SSR, supports Genrikson's proposal and suggests that construction of the wind tunnel be considered by the Scientific Research Institute of Construction, Gosstroy Estonian SSR.

An accompanying photograph shows a model of a building in a wind tunnel.

CSO: 5000

PROTECTING WATER RESOURCES

Moscow EKONOMICHESKAYA GAZETA in Russian No 27, Jul 78 p 2

[Article by V. Morozov, expert of the CEMA Secretariat]

[Text] Concern about environmental protection occupies an important position in the activity of the Council for Mutual Economic Assistance. The complex program for development of socialist economic integration provides a number of joint measures directed, specifically, to efficient use and protection of the water resources of CEMA countries. To implement these propositions, representatives of the People's Republic of Bulgaria, the Hungarian People's Republic, the German Democratic Republic, the Polish People's Republic, the Union Republic of Rumania, the USSR and the CSSR signed an agreement on creation of the International Economic Fraternity "Intervodoochistka." The agreement became effective at the beginning of this year.

The International Economic Fraternity "Intervodoochistka" is called upon to expand and intensify the cooperation of CEMA countries on specific problems of scientific research, planning-design and production activity directed toward development, introduction and operation of equipment, devices and installations for purification of waste waters and for water treatment. The fraternity studies the requirements of the participating countries for equipment and apparatus for waste water purification and water-treatment objects, determines and contributes to realization of the capabilities of development of domestic production of this equipment in these countries on the basis of international specialization and cooperation and determines methods of more efficient use of existing production capacities and the latest achievements of scientific and technical progress.

The participants of the International Fraternity "Intervodoochistka" are the corresponding economic organizations of its founding countries. For example, the All-Union Scientific Research Institute of Water Conservation (Khar'kov, Ukrainian SSR) participates in it from the Soviet Union. Membership in the fraternity does not infringe upon the legal status of its participants, who fully retain their property and organizational independence.

"Intervodoochistka" operates on the basis of joint management of it by all participants. One of the participants manages its affairs by appointment of the remaining participants. This participant is the economic organization of the People's Republic of Bulgaria -- the Committee for Heavy Investing Machine Building Attached to the Ministry of Machine Building and Metallurgy (Sofia). The committee provides at its own expense and its own efforts fulfillment of the functions of the working apparatus of the fraternity. At the same time the other participants, at their own discretion and upon coordination with the Bulgarian party, as the leader of affairs, may send specialists at its own expense to the working apparatus of the fraternity to participate in study and development of materials and problems subject to consideration within its framework.

The "Intervodoochistka" fraternity is not a legal entity. The obligations related to its activity are assumed by the participant conducting the affairs of the fraternity, that is, the management organization of Bulgaria mentioned above. It operates at the discretion of the other participants, but acts legally in its own name. At the same time, as noted in the agreement on creation of the fraternity, its participants bear unanimous responsibility for subsequent reckonings between them on the basis of special mutual agreement.

The presence of any international executive organization is not provided in the "Intervodoochistka" fraternity since, as was shown above, its functions are fulfilled by one of the participants of the fraternity. The fraternity's activity also does not require formation of statute or other funds by corresponding fractional contributions of the participants. True, the possibility of accomplishing joint cost-accounting activity of its participants within the fraternity in the future is not excluded. It is provided that the representatives of the competent organizations of these countries will consider the problem of the participants of the fraternity fulfilling joint economic activity with regard to the needs of the participating countries as experience is accumulated and will conclude the corresponding agreement if necessary.

The managing organization of the "Intervodoochistka" fraternity is the council. It consists of the representatives of all participants. If there are several participants from the same country, all of them together have only one vote in the council. The meetings of the council are competent provided that representatives of all participants of the fraternity having the right to vote are present at them. This provides full equal and democratic nature of the "Intervodoochistka" fraternity. The decisions of the council are implemented by conclusion of multiparty and two-party agreements between interested participants or on a different basis agreed by them.

The council is entitled to create specialized working groups to accomplish operative cooperation and to develop specific proposals and projects within the framework of the fraternity. Each interested participant may send his own specialists there. Their tasks and operating procedures are determined in the council by the interested participants. When representatives of specialized working groups are appointed, the uniform representation of

these duties is taken into account by the representatives of all interested participants.

The activity of the "Intervodoochistka" fraternity is carried out in close contact with the corresponding organizations of CEMA, primarily with the Conference of Directors of Water Management Organizations of the CEMA Member Countries and the Secretariat of CEMA. According to creation of the "Intervodoochistka" fraternity, it is provided that it takes into account the materials of CEMA organizations in its own work which may be related to its activity. It makes available periodic information about its own activity to the corresponding organizations of CEMA at their request or through its own initiative.

The "Intervodoochistka" fraternity is an open organization. Corresponding organizations and the organizations of other countries, including those that are not members of CEMA, may enter it. It may enter into business contacts with organizations of different countries and also with international organizations engaged in similar problems.

In creating the "Intervodoochistka" fraternity, its founders proceeded on the basis that it will contribute to a significant increase of mutual deliveries of equipment and apparatus by the interested countries of CEMA for waste water purification and water treatment, will make it possible to improve the technical level and efficiency of their production and will reduce expenditures for water purification and water conservation facilities. The activity of the fraternity will also make it possible to establish and strengthen the working contacts between the economic organizations of the interested countries on a permanent and long-term basis on design, manufacture and deliveries of equipment for waste water purification and treatment and will organize systematic direct business contacts between specialists of these countries.

The first steps along the path of developing the practical activity of this organization were taken at the first meeting of the council of "Intervodoochistka," held in February 1978 at Sofia. The plan of its operation for 1978 was ratified and measures to develop specific problems of cooperation for the following period were noted. The council considered that a working apparatus (directorate) was formed by competent organizations of the People's Republic of Bulgaria according to the agreement on creation of the fraternity to accomplish daily operative work on conducting the affairs of the fraternity. B. Tomov, a citizen of the People's Republic of Bulgaria, was appointed the director of the working apparatus. D. Nanov, a representative of the Bulgarian party, was elected chairman of the council of the fraternity for the first 2 years (until 1980).

International economic fraternities are also being created in other branches. Thus, the ministries of the People's Republic of Bulgaria, the Polish People's Republic, the USSR and the CSSR that manage the petroleum and gas industry signed an agreement on creation of an international economic fraternity

HYDROGEN -- FUEL OF THE FUTURE

Leningrad LENINGRADSKAYA PRAVDA in Russian 23 Jul 78 p 2

[Interview with Deputy Director of the Institute of Atomic Energy imeni I. V. Kurchatov, Corresponding Member of the USSR Academy of Sciences V. Legasov, in Leningrad on 23 July, by APN correspondent N. Andreyev]

[Text] [Question] Working at the Institute of Atomic Energy, you are involved in research in the field of hydrogen power engineering, i.e., with problems of using chemical rather than nuclear fuel. Are there not contradictions here.

[Answer] Not in the least. And this is why. Hydrogen is the lightest gas containing more thermal calories than in the same amount of gasoline and is an excellent, ecologically clean fuel. It releases heat without discharge of harmful substances into the atmosphere. But unlike classical types of fuel -- wood, coal, oil and natural gas -- there is almost no hydrogen in pure foem on our planet. But there is plenty of water -- the seas and oceans occupy more than two-thirds of the surface of the globe. And in order to produce this gas, the water must be broken down into its components, which requires energy. It turns out that a society deciding to extract an excellent high-calorie fuel from the vast world ocean will not be able to cope without primary sources of energy -- solar, atomic and thermonuclear, those to which the future of power engineering is usually related.

[Question] But why will atomic reactors be used to produce hydrogen? After all, water is broken down either by electric current or by heating to very high temperatures and in principle the source of thermal or electric energy could also become either coal, hydraulic or solar power plants.

[Answer] We assume that even in the future coal mining will be profitable and not too complicated. Coal is cut and burned, heat is produced and water is broken down. The result is ecologically pure hydrogen, which burns without harmful wastes, and clouds of gases and smoke above the plant. In 1970 alone thermoelectric power plants discharged up to 80 million tons of sulfur dioxide, millions of tons of ashes, carbon dioxide and mercury vapors into the planet's atmosphere.

Of course, the "purist" source of heat is solar energy. It would seem that nothing is simpler -- install mirrors, focus the beams and receive free heat. But are there places on the earth where the sun shines constantly? There are cloudy days even in the Sahara Desert. And the main thing is that in order to produce any kind of tolerable power at such a plant, the burning sands must be covered with tens of hectares of expensive reflectors and converters.

Moreover, the desert is a place where there is no water. From what can hydrogen be produced? This means that entire lakes must either be pumped here or solar energy must be converted to electric energy and as before many kilometers of electric power transmission lines must be suspended along which current will reach the consumers in the less sunny regions.

But an atomic reactor can be installed whereever desired. Its product -- heat -- breaks down water. The separated oxygen enriches the atmosphere and the hydrogen is transported in tanks or pumped like oil or gas along pipelines to where it is needed. And the important thing is: nuclear fuel turns over its energy immediately in the form of heat. There is no need, as is done at present, to initially heat metal in the reactor and then transfer the heat to water, convert it to steam and force it to act on turbine blades. And only the generator turned by the turbine finally produces electric energy. This is a long chain! And how many losses and how much heat is scattered uselessly, but not without harm to the environment.

If electricity remains in the future even as widespread a form of energy as now, its fraction in the total amount of energy required for normal viability of a society will hardly exceed 50-60 percent.

An analogy with the working principle of a living organism suggests itself here, where everything that is related to metabolism occurs due to chemical transformations. And nature accomplishes only fast-flowing nerve, information processes by using electric impulses.

Is such a separation of functions accidental? Hardly. Nature utilizes the electric form of energy only where it is absolutely necessary and where high speed and accuracy of energy transmission are required.

I feel that the structure of power engineering should correspond to the energy structure of the living organism and should allocate their role of a fast and accurate carrier of information to electricity. Hydrogen should be made the only source of energy in all remaining spheres -- in transport, in industry and in everyday life.

The advantage of hydrogen is not only in the ecological purity and enormous heat-producing capability, but also in convenience of transport. If electric power is transmitted over great distances -- a very complex and expensive matter and the energy losses increase sharply with the length of the line, the cost of pumping or hauling hydrogen whereever required is less dependent on the remoteness of the consumer.

Finally, unlike electric power plants which are absolutely unsuitable, let us say, for aviation, electric energy is subject to "conservation" and storage for the future with difficulty -- hydrogen power plants may operate even in the sky without interference. The design of the engines need hardly be changed.

You know that the electric automobile, called upon to maintain the purity of the city atmosphere, is not yet a very independent type of transportation. It depends too much on the capacity of storage batteries which are unable to accumulate a sufficient amount of energy for practical needs.

Hydrogen is a different matter. It is easy to store and transport to any distance and to burn there where it is needed. You pour liquid gas in the frozen state into the tank and take off. There is enough fuel for a longer run than in present automobiles. And this is in no way a dream -- vehicles operating on hydrogen are already traveling the roads of the country.

[Question] You have in mind the compact "Moskvich" and "Volga" automobiles, which have been reequipped for hydrogen fuel at the Khar'kov Institute of Problems of Machine Building.

[Answer] Yes, I am talking about these automobiles, experiments with which will make it possible to analyze some practical problems of "hydrogen" transportation. It remains to be determined: is it more convenient to fill a tank with liquid hydrogen or compounds of it? And perhaps gas can be produced as a result of the reaction of water with some substance, occurring directly "on board" the automobile? Finally, should "classical gasoline" be immediately rejected? Wouldn't it be better to first travel on a gasoline-hydrogen mixture? It has been proved experimentally that, having added 3-5 percent hydrogen to ordinary fuel, the discharge of harmful combustion by-products into the atmosphere can be sharply reduced. The exhaust becomes ecologically clean even by the rigid modern requirements. Besides, 20-30 percent of the fuel will be saved.

Trucks operating on the same mixed fuel will appear during the next 2 years. The first field of activity has already been determined for them -- open-pit iron ore mines at the Kursk deposit.

The vehicles require minimum design conversions. Only the carburetor need be changed, which will supply a gasoline-hydrogen-air mixture to the engine.

[Question] If we are talking in general about transport and about the entire energy economy of society rather than simply about automobiles, what will be the price of conversion to hydrogen as the only universal fuel.

[Answer] The fact is that hydrogen reduces to a minimum revolutionary readjustments of power engineering. Judge for yourself -- nuclear reactors, which long ago proved their right to existence, are being successfully developed and will begin to produce approximately half of all energy by the end

of our century. The technology of hydrogen production, storage and transportation is being developed parallel with them. Finally, by evolution -- I emphasize by evolution rather than intermittently -- engines and boilers, domestic kitchens and heating systems and a mass of other devices now operating on oil and its by-products, natural gas or coal will be adapted for hydrogen fuel.

Of course, there are difficulties in this path, but one can cope with them. The first thing is to learn how to produce inexpensive, commercially suitable hydrogen from water. Next are problems of cryogenics, keeping hydrogen in a frozen, i.e., liquid, state. But again there is already much experience in this field. In short, there are enough problems but they are completely within the capability of present and even more so of future technology.

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BRIEFS

GAS TREATMENT PLANT--A new gas treatment plant operated by specialists of the Leningrad Branch of the Planning Institute "Giprogazoochistka," has become operational at the Association "Znamya truda." "This is the second model which we have designed for this enterprise," relates the chief engineer of the project L. M. Pazin. "Unlike the first which has operated successfully for 3 years, it services a large number of steel-smelting furnaces. This is a modern filter of synthetic fabric, consisting of more than 500 sleeves -- the length of each is 8 meters. Approximately 1 million cubic meters of gas is reprocessed in it per shift. The degree of scrubbing -- 99 percent -- corresponds to the best worldwide standards." The specialists of the institute have now begun to complete the detail design of another complex for a new foundry under construction. Scrubbing will be carried out in it in sleeve filters of new design -- simpler to maintain and having no moving parts that wear out. No complex operation is required to clean the sleeves -- dust is "shaken off" the fabric periodically by the spent gases by reverse blowing. [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 19 Jul 78 p 2] 6521

WATER POLLUTION CHECK--Leningrad, 17 July--The research ship "Rudol'f Samoylovich" departed today along the Baltic and North Sea on a "sanitary inspection." The expedition of scientists will observe the hydrological regime, chemical state and pollution of vast water spaces during the 1.5 month voyage. The "Rudol'f Samoylovich" is the youngest ship in the fleet of the Arctic and Antartic Scientific Research Institute. It is designed to monitor the purity of sea basins. The new expedition is being carried out within the framework of the International Convention on Protection of the Baltic Sea, the initiator of which was our country. The results of the observations of Soviet scientists will serve as the basis for development of recommendations on protection of the water medium against industrial pollutants. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 18 Jul 78 p 1] 6521

CSO: 5000

CONFERENCE FINDS DDT STILL PRESENT IN MOTHERS' MILK

Copenhagen BERLINGSKE TIDENDE in Danish 21 Jul 78 p 3

[Text] If mothers' milk were covered by West Germany's legislation on food materials, it would be prohibited as human food, according to a report which a research organization has published in Bonn.

The concentration of harmful materials exceeds the limit established in the legislation for food materials of animal origin. But mothers' milk is, in spite of everything, the best food for babies, the West German researchers emphasized.

Danish laws have not yet established limits for the pesticide content in food materials, but the rules which are being worked out tend to follow the norms set by WHO and FAO. However, for DDT the regulations will be somewhat stricter.

In West Germany a kilogram of meat or milk fat may contain a maximum of 3 milligrams of DDT.

Seen on this background, cow milk is purer than mothers' milk, both in Denmark and in West Germany, but in this connection it should be pointed out that the limit has been set far below the danger level.

"It is obvious that Danish babies get DDT in their mothers' milk, but the positive effects of this natural food are so great that it would be ridiculous to talk about risks," Director Emil Poulsen, National Institute of Food Materials, tells BERLINGSKE. "I don't know what the DDT content in Danish mothers' milk is. We have not investigated it, but research in other places in this country leads to the assumption that it is purer than the West German."

"Mothers' milk is the most correct nourishment for babies," says Engineer Hans Lokke, the Food Materials Institute. "And at the same time the child gets a series of important antibodies, which protect it against disease and infections."

There are strict regulations about the use of DDT and other pesticides, which were scattered generously at the time when nobody thought that these poisons which are difficult to break down would pass up through the food chain and end up in human bodies. And thus also in mothers' milk and babies.

DDT was prohibited in Denmark in 1969, except for the very small amounts which are permitted in forestry.

"Since 1969 we have experienced a drop in the DDT content in butter," Hans Lokke points out.

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CSO: 5000

DENMARK AND SWEDEN TO ESTABLISH SEISMIC STUDIES FOR N-PLANT SITING

Copenhagen POLITIKEN in Danish 8 Jul 78 p 1

[Text] Denmark and Sweden have started a joint research project to ensure that future nuclear power stations will not be located in areas in the two countries where there is any possibility at all of earthquakes. In southern Sweden 17 seismic measurement stations are being set up. Later on they will be connected together with three stations on Sjaelland.

The research collaboration was started this year, for one thing, because there is a geologic dislocation between Denmark and Sweden in the northern part of Oresund and the southern part of Kattegat.

"Even if southern Sweden and Denmark seismically belong to some of the quietest areas, this dislocation may give rise to some earthquakes," says the leader of the Swedish part of the research project, Ola Dahlman.

The question is of even more interest for Sweden because the possibility of storing radioactive waste in the Swedish bedrock has been discussed. In parallel the Swedish Defense Research Institute has through the Swedish press started an investigation to find out what took place around Ystad on Thursday morning last week. Many inhabitants in the city have reported that they were awakened by tremors which lasted up to 30 seconds. From answers to questionnaires the research institute wants to establish what took place and over how large an area earthquakes can be noticed.

The seismic stations which are being established in southern Sweden and in Denmark are more sensitive than normal seismic measurement stations, which are designed to measure earthquakes at a distance of 1,000 kilometers or even farther away.

The last strong earthquake which was registered in Norway, Sweden, and Denmark took place in 1904. It was centered in the Oslo Fjord and had approximately the same strength as the earthquake which struck northern Italy a year ago. There was damage to houses in several Italian villages, but the earthquake did not cost any human lives.

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PROJECT TO SAVE BEACHES ANNOUNCED

Copenhagen POLITIKEN in Danish 15 Jul 78 p 18

[Text] Work costing many million kroner is necessary if the northern coast of Sjaelland from Hundested to Helsingor is to be guaranteed a reasonable standard in the future. If nothing is done now, especially the bathing beaches will become considerably worse in a few decades. The costs are in part to clear the existing coast protection installations and set up new breakwaters and wave breakers and in part artificial fill at certain places on the 60-km-long stretch of coast. In return there should be good possibilities for the creation of new bathing beaches, especially at Hornbaek Plantation and Kikhavn.

This was brought out in an extensive investigation carried out by the five municipalities affected and Frederiksborg County. The report has been underway for 7 years. In turn it is--except for the west coast--the first Danish attempt at evaluating a larger section of the coast as a whole.

The background for the report is the general feeling that it is necessary to make a coordinated effort to secure the coast. It has been shown that a number of private measures, for one thing on the coast west of Liseleje, do more damage than good. Water breakers and wave breakers have been located without plans and result in an unnecessary degradation of the quality of the beach.

The report has not yet been subjected to a political evaluation. But in a series of draft proposals technicians from the consulting company Holdstrup-Schultz and Sorensen and Danish Hydraulic Institute point to possible solutions of the problems.

In most sections along the coast, measures of one kind or another are necessary. Still it would hardly be possible over the long range to preserve the northern coast in its present condition. Natural wind and current conditions result in a continuous receding at many places.

One of the places threatened is the distance from Liseleje to Tisvildeleje. If the beach and the dunes are to be preserved, it is necessary with a

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considerable filling up, which in the professional language is referred to as lining the beach. Otherwise the beach and the dunes will slowly be pushed back by the sea.

Here the technicians propose that the natural resources of beach deposits further inland be used. The excavation holes can in that case be used for establishing fire breaks, setting out fish for breeding for recreational fishing, and for sailing with dinghies. This type of water holes would also become important for the bird life.

The report on the care of the coast and securing the coast will after the summer vacation be presented to the respective municipal administrations and the county council. Only then will it be decided whether the work should continue. It might possibly become of interest to let the capital council join in the work.

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END