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CONTENTS PAGE

ASIA

SOUTH KOREA

Quake Jolts Nation; Roads, Buildings Cracked
(THE KOREA TIMES, various dates) 1

Hongsung, Chungchong-Namdo Regions Hit
Unprepared for Quake
Probe Team Reports Findings
Further Probe Team Findings

Nature Protection Charter Promulgated
(THE KOREA TIMES, 6 Oct 78) 5

Large Portion of Budget To Be Used To Fight Pollution
(THE KOREA TIMES, 12 Oct 78) 7

Air Said To Be Polluted, With Dust
(THE KOREA TIMES, 15 Oct 78) 8

Briefs
Repair Pollution Facilities 9
Environment Preservation Association 9

THAILAND

Mercury Pollution Endangers Fish in Gulf
(THE WORKING PEOPLE'S DAILY, 4 Oct 78) 10

LATIN AMERICA

BRAZIL

Pollution of Sao Paulo State Basins Discussed
(Luiz Roberto Tommasi; FOLHA DE SAO PAULO, 27 Aug 78). 11

CONTENTS (Continued)

Page

Effects of Porto Alegre River Contamimation Discussed
(O ESTADO DE SAO PAULO, 10 Sep 78) 15

NEAR EAST AND NORTH AFRICA

IRAQ

National Institute Studies Effects of Industrial Pollutants
(AL-THAWRAH, 25 Sep 78) 19

USSR

USSR

Air Pollution in Nizhnekamsk Discussed
(F. Bagautdinov; TRUD, 1 Oct 78) 22

Legal Protection of Nature in Kazakhstan Analyzed in Recent Book
(V.S. Shelestov, A.M. Zaporozhets; VESTNIK AKADEMII NAUK KAZAKHSKOY SSR, No 8, 1978) 26

Briefs
Automotive Clear Air Computer 30
Compound Combats Oil Spills 30

WESTERN EUROPE

GREECE

Plan Sewage Treatment Works for Saronikos Gulf
(TA NEA, 22 Sep 78) 31

Briefs
Marble Crushing Pollution Risk 33

TURKEY

Briefs
Air Pollution Seminar 34

WEST GERMANY

Problems, Progress in Cleaning Up Rhine Discussed
(WIRTSCHAFTSWOCHE, 22 Sep 78) 35

QUAKE JOLTS NATION; ROADS, BUILDINGS CRACKED

Hongsung, Chungchong-Namdo Regions Hit

Seoul THE KOREA TIMES in English 8 Oct 78 p 1

[Text]

An earthquake triggered yesterday evening cracks of roads and buildings and breaks of glasses and panes, causing property damage in Hongsung, Chungchong-namdo and some other regions.

Fortunately, however, no one was reported dead or seriously injured.

The regions which were stricken most seriously by the quake, which registered four degrees on JMA scale, were the regions surrounding the Taean peninsula, Chungchong-namdo.

The Central Meteorological Office announced that the earthquake, one of the strongest ever hit in Korea, was measured at four degrees in the areas some 112 kilometers southwest of Seoul.

The office said the quake occurred at 6:21 p.m. and lasted for three minutes and nine seconds.

According to reports to the Home Affairs Ministry, the quake, believed to have registered about two to three degrees, was felt in Seoul, Taejon and Kwangju areas for two times with about two minute-intervals.

The Hongsung authorities concerned said many chimneys were collapsed and panes of big buildings and dwelling units were broken, stricken by the quake, which might have registered around five degrees.

The authorities also reported that cracks could be easily found in roads and buildings.

Residents in Seoul, Taejon and Kwangju regions said they have felt the jolt of their panes, but not so seriously.

Yesterday's quake was taken place 22 days after earthquake of around three degrees of intensity on the JMA scale was felt through the nation on Sept. 16.

Yesterday was really an unfortunate weekend for the people, especially residing in Hongsung and the regions around Taean peninsula.

At a time of their weekend supper, they were reportedly surprised at the unexpected trembling sounds just like the passing of tanks and ran out of their houses.

The districts hit most seriously by the quake in Hongsung were the downtown areas in Okwan-ni.

Electricity failed for some hours, paralizing radio and television networks. But fortunately, no fire broke out and no dead or serious injured were reported.

The police and other authorities concerned were conducting surveys on the possible damages and personal injuries.

Shortly after the quake, they found a crack of about 1 centimeter on a 8-meter-wide paved road in the downtown. The crack covered about 20 meters.

The three-story Hongsung county office building was marked with cracks ranging from one to two centimeters in 10 places and most of the panes of the office were broken.

The 10-meter high chimney of the Hongsung police headquarters was destroyed completely and walls of the headquarters were cracked.

Park Kyung-ho, 32, said his house, located at first block of the Okwan-ni was destroyed by the quake.

In Suk-jin, manager of the Hannam Super Market, said part of the ceiling of his shop was collapsed and about 50 bottles of beer dropped from a shelf at the moment, causing injuries to Miss Lee Yong-ok and one other.

The residents were astonished, when they entered into their houses of the quake, at the facts that the wall clocks stopped at 6:21 or 6:22 p.m., the opening of cabinets, cracks of walls and wrecked panes.

All panes of the Hongsung High School were smashed.

Meanwhile, Kim Byung-kook, 38, an employe of a trading company, said he felt the trembling of his chair over tea with his friends at the rounge on 13th floor of The Korea Times.

He said the panes of the rounge looked jolting. Most of Seoulites seemed to have failed to feel the tremor. However, those who have been at a place over 10-story buildings reported they have felt some minor shock.

The weatherman in Kwangju, Cholla-namdo disclosed that an earthquake supposed to have registered about two degrees lasted for 20 minutes, resulting in jolting of high-building panes.

Unprepared for Quake

Seoul THE KOREA TIMES in English 10 Oct 78 p 8

[Text]

An earthquake which struck Chungchong-namdo and southeastern areas of the country Saturday evening caused property damage estimated at over 190 million won and injuries to two persons, the National Police Headquarters reported yesterday.

Though the damage was not so serious, the quake, the second in less than a month, brought worry that Korea might not be safe from earthquakes, contrary to common beliefs among Koreans.

Only last Sept. 16, a fairly strong earth tremor jolted Seoul and almost all provinces, though it caused no severe damage.

Because of the absence of any earthquake of devastating force in recent centuries, Korea is totally unprepared for quakes and even the Central Meteorological Office is not equipped with any modern seismological devices.

Belatedly, CMO officials said that they were planning to purchase new seismographs and other meteorological observation facilities. But early implementation of the plan will be difficult because of budgetary limitations.

The CMO said the Saturday tremor was the 11th to be recorded in this country this year. There were eight mild quakes in 1976 and two in 1977, according to the weather office.

Historical materials show that there have been more than 2,000 earthquakes in Korea since the 3rd century. And at least 73 of them were recorded as fairly strong jolts causing damage.

Saturday's quake was the strongest since the tremor on July 4, 1936 which hit Mt. Chiri and its vicinity, killing 10 people.

According to seismological experts, Korea had relatively frequent earthquakes between the 13th and 17th centuries but the frequency has considerably declined since that period. But the recurring tremors in recent years might indicate a change in the geological situation of the country, they said.

Saturday's quake was determined as having an intensity of four degrees on the JMA (Japanese Meteorological Agency) scale, which classifies earth tremors into seven degress. The intensity was judged by the extent of damage and not by any seismographic records.

Korea has only two Japanese-made 'Kashushima-type" seismographs, one in Seoul and the other in the Kwangju weather office, which use the seven-degree JMA scale for intensity readings.

The Kashushima seismograph in Kwangju recorded two degrees Saturday and the one in Seoul showed zero degrees, the CMO said.

This seismograph, however, cannot correctly record tremors of over three degrees because of its simple mechanism. The seismograph in Seoul was almost broken when a strong jolt hit the Seoul area last Sept. 16.

The CMO had a relatively more reliable WWSSN-type seismograph which was donated by the U.S. Seismological Institute in 1962 but it was sent back to the United States recently for repair.

* * *

Provincial administration authorities of Chungchong-namdo said yesterday 14 houses were completely destroyed along with cracks in the walls of 45 office buildings and 2,450 dwellings in the 20,000-population town of Hongsong.

Commodities at more than 50 shops and 500,000 anthracite coal briquets stored at houses for winter use were destroyed.

Rehabilitation work started immediately with the mobilization of police, the Homeland Reserve Force, and the Civil Defense Corps.

In the case of the three-story concrete office building of the Hongsong county, 25 windows were broken and cracks developed all over the walls.

About 15 meters of an old fortress around Choyang Gate, a provincial cultural property, were also broken in the earthquake Saturday evening.

The residents in Hongsong, believed to be the nearest town to the epicenter, were again caught by horror upon perceiving fresh tremors twice the following morning. However, the tremors, apparently a part of the receding wave of the quake, died out without wreaking further damage.

Four people suffered coal gas poisoning because of cracked "ondol" floors. But they recovered consciousness at clinics.

The town authorities warned the people of the danger of coal gas poisoning because it might break out in large numbers because most of the houses were feared to have developed cracks.

The severest damage was seen in the Okwan-li area, center of the town of Hongsong. Pak Kyong-ho, 32, said he was about to leave his seven-year-old wooden house to call in his two sons for supper, when the house shook heavily with a thundering sound.

He said he thought at first that it was bombing and war had broken out.

Mrs. Om Hwa-ja, 43, said she was entering a room with food on a small table for supper when she felt herself turning upside down. Caught in a panic, she threw away the table and left the house in a fit of horror, she said.

One centimeter wide cracks developed in three places on a small airstrip near the town.

Choi Kyong-nam, 36, who was playing billiards at the time of the quake, said the balls sprang suddenly like soybeans on a hot frying pan.

Lee Chong-su, 17, said he was tumbled on to the ground from his bicycle at the time of the earthquake.

Clocks on the walls stopped and telephones were out of order after the earthquake. Electricity was also cut off by the jolt, throwing the town into utter confusion.

Probe Team Reports Findings

Seoul THE KOREA TIMES in English 13 Oct 78 p 8

[Text]

HONGSONG, Chungchongnamdo — A survey team sent by the Ministry of Science and Technology has concluded that the epicenter of Saturday's earthquake was the town of Hongsong-up rather than the Taean Peninsula west of it as presumed earlier, team members said.

The source of the tremor was also believed to be about 10 kilometers below the surface.

Team leader Chong Bong-il said that the earthquake, which was the strongest in this country in 42 years, was believed to be closely related to the location of a hot spring in the nearby Toksan area.

Another survey team from Seoul looking into property damage caused by the quake has determined that full restoration of the town would require far more than the initially calculated 300 million won.

The damage was increased by minor tremors after the Saturday night jolt, according to Han Kyu-bong of the Construction Ministry.

Most severely damaged were five school buildings in the town. The Hongsong County administration and requested 170 million won for the restoration of the school buildings but the survey team concluded that this amount of money would not be sufficient to completely rebuild the damaged structures.

About 35,000 bags of cement and 2,000 plywood boards were supplied to the county office for urgent use in restoration work.

Further Probe Team Findings

Seoul THE KOREA TIMES in English 15 Oct 78 p 8

[Text]

The on-the-spot quake investigation team called upon the government yesterday to introduce quake-resisting construction methods in building large structures to effectively cope with possible earth tremors in the future.

In its official report, the five-member expert team, headed by Prof. Chong Pyong-il of Seoul National University, said that the quake damage could have been reduced to some extent if such a construction method had previously been applied.

In addition, the survey team called upon the government to expand the budget of the Observation Bureau at the Central Meteorological Office in Seoul and its provincial branches to secure expert personnel and facilities for quake detection.

The team sent by the Ministry of Science and Technology also urged the government to conduct a nation-wide survey to detect seismologically vulnerable areas to establish comprehensive countermeasures.

The investigation team consisting of geological professors, a seismological researcher and officials of the Ministry of Science and Technology, made an overall survey of Hongsong-up and neighboring areas in Chungchong-namdo by examining geological strata, cracks in the earth, damage to houses and buildings and interviewing residents.

The most severely damaged area was within a radius of 500 meters of the Hongsong County administration building in Hongsong-up, and outside the area, the damage declined sharply, according to the report.

In particular, no damage was detected in Kobuk-myon, Sosan County, Chungchong-namdo, which is 20 kilometers from Hongsong.

Interviews with residents in various areas showed that quake intensity in the vicinity of the county office building was around five degrees on the JMA scale, while on areas outside the 500-meter radius area was around three degrees.

The report also said that the major quake direction was found to be east-west through examination of changes in the geological strata and the shape of earth cracks.

The team, however, could not determine the exact source and the depth of the tremor due to the absence of a seismograph near the area at that time.

CSO: 5000

NATURE PROTECTION CHARTER PROMULGATED

Seoul THE KOREA TIMES in English 6 Oct 78 p 1

[Text]

President Park Chung-hee stressed yesterday that the on-going nation-wide nature protection campaign should be carried out with voluntary participation of the people to make their environment clean, beautiful, and pleasant.

"The mighty nature surrounding us is not only the source of human life but a precious resource indispensable for our livelihood," he pointed out.

He said that despite this fact, people did not intend to pay grave attention either to damage to or waste of natural resources.

"Particularly, along with modern industrial development, this trend has become a global phenomenon which has resulted in damaging the natural environment more seriously than ever before, including air and marine pollution," he said.

He continued, "It is as clear as the light that if this tendency continues to be neglected, a formidable crisis in which the survival of humankind itself will be endangered will approach in the not too distant future."

The Chief Executive emphasized the need for promotion of the nature protection drive in an address during a ceremony at the Seoul Sejong Cultural Center to promulgate the Nature Protection Charter.

Urging the people to participate in the campaign in a sincere manner to attain successful results, the President called the nature protection campaign a spiritual purification drive that would make minds of individual persons clean and healthy.

Charter Spirit

"The spirit of the charter must become a directing post for the future course of action and the main principles of practice," he said.

He said, "Our hands should be stretched whole-heartedly even to all invisible corners and we are obliged to devote ourselves in order not to make the pan-national nature protection drive only a formal event."

The President said that the true purpose of the campaign was to create a clean, beautiful, orderly, and harmonious environment in every place—mountains, rivers, households, places of work, farming villages and cities.

"I have learned through my recent on-the-spot observation of nature protection that there are many areas where the campaign is being implemented well, whereas in other places it is being pursued just in a formal and insincere manner," he said.

He then noted that trash was still left in such remote sites as woods and cracks in rocks.

"I also heard that some persons in responsible positions did not participate in the campaign, while others just maintained an onlooking attitude while participating in business suits."

Charter for Nature Protection

The human being is born from nature, lives with its benefits and eventually returns to its bosom.

The sky, the earth and the sea and everything within them provide resources to support their existence.

Nature, being the ultimate source of the lives of human beings and all other living matter, maintains order and harmony while undergoing endless changes in accordance with inscrutable formulae.

From long ago, our ancestors have adorned our rivers and mountains until they resemble the beauty of embroidery and cultivated a noble national culture in harmony with nature.

However, the development of industries and the expansion of population contaminated the air and water, and ruined plants, and indiscreet damage by men destroyed the balance of nature, thereby injuring the living environment and even threatening the existence of human beings and all other living matter.

Therefore, all the people of the nation are now urged to give greater love and care to nature with renewed appreciation of its benefits and make their best efforts to recover and maintain the order and harmony of nature eliminating all factors of environmental pollution.

A Charter for Nature Protection is hereby promulgated with the concerted desire of all the nation to make our land a more beautiful and more useful place to live in and bequeath it to the next generations. Every one of us now resolves to carry it out with faithfulness.

1. Love of nature and preservation of the environment are the obligation of the state, public organizations and all people of the nation.
2. Beautiful natural scenes and natural resources with cultural and scientific value should be protected for the interest of the whole of mankind.
3. The spirit of nature protection should be infused into each one of us through education in homes, schools and all fields of society.
4. Industrial development should be carried on with the utmost caution to harmonize with nature and consideration for nature preservation should always precede development plans.
5. The contamination and destruction of nature by discarding wastes and refuse and excessive use of chemicals must be prevented.
6. Damaged and destroyed nature should be restored immediately.
7. Every citizen should first clean up his or her own surroundings and then go on beautifying the entire national territory.

CSO: 5000

LARGE PORTION OF BUDGET TO BE USED TO FIGHT POLLUTION

Seoul THE KOREA TIMES in English 12 Oct 78 p 1

[Text]

Prime Minister Choi Kyu-hah said yesterday he would direct the Seoul city administration to use large amount of money in its budget for fiscal 1979 to help it overcome the ever-worsening pollution in the metropolis.

The government had begun to accord top priority to the pollution problem to save the rapidly developing country from decaying, Prime Minister emphasized.

He was answering questions by three ruling and opposition lawmakers in the plenary session of the National Assembly which shed light on pollution.

Referring to the dearth of manpower in rural areas, the prime minister said that the gevernment would do its best to secure enough manpower to achieve steady development of farmland.

At the same time, emphasis will be placed on educating competent farmers, providing funds for farming, fostering agricultural schools and speeding up agricultural mechanization, he noted.

In his reply to the parliamentary interpellation, Home Minister Kim Chi-yol said that his ministry would augment policemen now in shortage under a five-year manpower supply plan.

Because of financial problems the ministry is not offering enough rewards to policemen he said. "But their monthly salaries will be raised by increasing a variety of allowances."

"However, the pollution problem will not be solved in a short period because it requires a huge amount of money," he said in the question-and-answer session.

The government plans to make it compulsory for new refineries to equip themselves with de-sulfurizing devices, replied the prime minister.

He told the Assembly that the existing refineries would be supplied with oil containing relatively less sulfur on a gradual basis after 1981.

When the administration reorganizes its structure, he said, it will consider setting up an environment agency or a pollution court, which was suggested by Rep. Choi Hyung-woo of the opposition New Democratic Party.

During the five-and-a-half-hour session, Health and Social Affairs Minister Shin Hyon-hwack said that the government would inaugurate a pension system in 1981 after expanding the current medical insurance system.

Answering a question by Rep. Kim Eun-ha of the NDP, Minister Shin said that his ministry's top emphasis would be on the materialization of an affluent society with a fullfledged security system.

In efforts to free the country from the pollution danger, the government will establish a geometric grid system for measuring air pollution throughout the country on a gradual basis, the minister said.

The system would be implemented first in the capital city and industrial complexes and then spread to other areas.

"I am determined to eliminate the 'essential evil' (pollution) in a resolute and sincere manner," the minister stressed.

CSO: 5000

AIR SAID TO BE POLLUTED, WITH DUST

Seoul THE KOREA TIMES in English 15 Oct 78 p 8

[Text]

The air of the capital city area contains a large amount of dust, one of the major causes of air pollution, as much as some three times the permissible amount set by the United States government, a Yonsei University survey has revealed.

A survey team consisting of members of the preventive medicine laboratory of Yonsei University led by Dr. Kwon Suk-pyo also found that the air of Seoul contained considerable amounts of heavy metals and harmful gas through its research conducted since January last year.

The survey showed that the average amount of accumulated dust in the air of Kuro-dong was 300 micrograms per cubic meter, at Kwanghwamun Intersection 264 micrograms, and in Shinchon 178 micrograms.

The amount of dust in the air of the examined places reached some 2.1 times to four times the U.S. permissible amount which stands at 75 micrograms, the survey revealed.

In the case of the air in Kuro-dong where a number of factories are located, the average maximum amount of dust recorded in a day was 442.3 micrograms. The U.S. permissible maximum amount of dust for one time stands at 260 micrograms.

The dust in the air of the Kwanghwamun Intersection contained hydrocarbon compounds, which are known to cause cancer, amounting to 26.9 micrograms per cubic meter of air, which was far more than that in the air of New York City, the survey showed.

CSO: 5000

BRIEFS

REPAIR POLLUTION FACILITIES--A total of 409 businesses across the nation had been ordered by the authorities more than twice to repair their pollution-causing facilities as of the end of September, it was revealed in a report to the National Assembly by the Health-Social Affairs Ministry. The ministry report showed that the businesses included well-known big firms and state-run enterprises such as the Korea Shipbuilding Engineering Corporation, the Inchon Iron and Steel Co., the Korea Tungsten Mining Co., the Dongkuk Steel Mill Co., the Ssangyong Cement Mfg. Co., and the Cheil Synthetic Textile Co. Of the 409 enterprises, 241 are in the Seoul area, 64 in Kyongsang-pukto, 46 in Kyonggi-do, 26 in Kangwon-do, 15 in Kyongsang-namdo and Chungchong-pukto each, 14 in Cholla-namdo, eight in Pusan and Seven in Chungchong-namdo. The major pollutants emitted by the businesses were mostly waste water and thick smoke, the report said. [Text] [Seoul THE KOREA TIMES in English 15 Oct 78 p 1]

ENVIRONMENT PRESERVATION ASSOCIATION--The Korea Environment Preservation Association was inaugurated yesterday to become the first legal body conducting various public activities to prevent pollution. Some 70 persons representing pollution-causing businesses, academic circles, mass media, industrial organizations and all other walks of life elected Tae Wan-son, president of the Korea Chamber of Commerce and Industry, the first president of the association in an inaugural meeting at the KCCI building in downtown Seoul. Under the provisions of the Environment Preservation Law enforced last July, the association will take charge of investigation, research, technical development, and enlightenment projects concerning the preservation of the environment and will establish city and provincial branches soon. [Text] [Seoul THE JAPAN TIMES in English 7 Oct 78 p 8]

CSO: 5000

MERCURY POLLUTION ENDANGERS FISH IN GULF

Rangoon THE WORKING PEOPLE'S DAILY in English 4 Oct 78 p 4

[Text] BANGKOK, 2 Oct—Fish, one of Thailand's most popular foods, could become dangerous to eat as mercury pollution caused by industry increases in the Gulf of Thailand, according to a leading researcher here.

Dr Thaweesookbi Piyakarnchana told reporters yesterday that both fish in the Gulf of Thailand and people living on its coasts already showed levels of mercury higher than the accepted danger level of one microgramme per litre.

Dr Thaweesookbi, Director of the Institute of Environmental Research at Bangkok's Chulalongkorn University, said the threat to marine life from pollution is immediate and could threaten consumers unless it was checked.

He said a long-term study made between 1975 and 1976 showed mercury levels in the Gulf of between 0.76 and four microgrammes per litre.

More than 20 per cent of more than 1,200 people living in coastal areas tested showed mercury levels of between 1.1 and 15.6 microgrammes per litre, he said.

CSO: 5000

POLLUTION OF SAO PAULO STATE BASINS DISCUSSED

Sao Paulo FOLHA DE SAO PAULO in Portuguese 27 Aug 78 p 26

[Article by Luiz Roberto Tommasi of the USP [Sao Paulo University] Oceanographic Institute: "Pollution of Sao Paulo State Basins"]

[Text] Completing the article of last week, we will describe today the situation of the Tiete River, Greater Sao Paulo and coastal basins. For the purpose of pollution control the Tiete was divided into five basins: three in the interior and two in Greater Sao Paulo.

Almost all of the Sao Paulo metropolitan area is situated in the Upper Tiete headwaters basins and the Upper Tiete metropolitan zone basin. In these are located 34 of the 37 municipalities that comprise the Greater Sao Paulo metropolitan area. The following municipalities did not have public water-supply systems in 1977: Aruja, Barueri, Cajamar, Carapicuiba, Embu-Guacu, Ferraz de Vasconcelos, Francisco Morato, Itapevi, Itaquacetuba, Jandira, Juquitiba, Rio Grande de Serra and Taboao da Serra. Moreover, despite the many efforts made by the SABESP [expansion unknown], many municipalities do not yet have satisfactory water facilities.

Sewage from a population of more than 10 million inhabitants is discharged raw into the bodies of water in the Upper Tiete basin and circulates through the urbanized area. This sewage and much liquid industrial refuse are discharged without treatment into the waterways, except for the effluents from the Vila Leopoldina and Pinheiros treatment stations, which remove 2 percent of the metropolitan area's pollution load.

The Upper Tiete basin, which is the stretch of the Tiete from Salesopolis, where it begins, to where it meets the Itaquera River, receives the sewage from Mogi das Cruzes, Suzano and Biritiba Mirim. There are also in this region 106 polluting industries, especially Brazil Viscosa S/A, Suzano Paper and Cellulose Company and Hoechst do Brasil S/A. Of these 106 industries, 39 were already treating their effluents in 1977. The biggest polluter of the basin is the Suzano Paper and Cellulose Co, but last year it reduced its polluting potential from 45,000 kg DBO [expansion unknown] per day to 13,000 kg DBO per day, which is equivalent to a population

reduction from 830,000 to 240,000 inhabitants. The effluents of this company, plus those of Viscosa and Hoescht, together with the Mogi da Cruzes and Suzano sewage, account for 90 percent of the organic refuse dumped into that stretch of the Tiete.

In the Upper Tiete metropolitan zone basin, 787 polluting industries were registered, of which 188 had installed treatment systems. Industrial pollution in this stretch is due especially to chemical and metallurgical industries, with little organic refuse. One of the major polluters is the Nitroquimica Co, but it already has plans and construction underway for effective treatment of its effluents. The major organic polluter is the Melhoramentos de Sao Paulo Co, which discharges into the Juqueri 8,500 kg of DBO per day, which is equivalent to a population of 160,000 inhabitants.

In the Upper Middle Tiete basin 138 polluting sources are established, of which just 8 are responsible for 82 percent of pollution in that part of the river. Those located there are paper and cellulose, textiles and food industries and the sewage of Botucatu, Salto and Porto Feliz, which do not have any treatment. There are serious problems in the city of Salto from detergent foam coming from the domestic sewers of Greater Sao Paulo. Polluting potential discharged into this basin is about 71,000 kg DBO per day. The basin's area is 5,712 square km.

The Lower Tiete basin is the final part of the river, where it empties into the Parana. In this part it is classified as a Class II river. Despite this, it has a pollutant residual of about 23,000 kg DBO per day, equivalent to the sewage of a population of 420,000 inhabitants. The basin's area is 12,253 square km. It has 92 polluting sources, of which 10 are responsible for 85 percent of the total pollution. Among them are the sewage systems of Aracatuba, Birigui, Penapolis, Pereira Barreto and Jose Bonifacio. A tannery, a sugar mill, two cold-storage plants and Paoletti, which is the main polluter of the basin, are responsible for 36 percent of it. Thanks to the collections and fines that have been received, that industry made various arrangements to reduce its pollution load.

The Upper Middle Tiete basin, with 31,849 square km, is the largest in the state of Sao Paulo. There are 266 pollution sources located there, which originate a load of pollution equivalent to 3,921,000 inhabitants. Among these polluting sources are the sewage of Brotas, Torrinhas, Itirapina, Araraquara, Sao Carlos and innumerable other cities, such as Bauru, Jau, Lins, etc, food industries, sugar mills, etc. In spite of this grave picture, the real polluting potential of the whole basin is now reduced, due to the control measures that have been taken. As a matter of fact, when we speak of industrial polluters in these two articles, it must be understood as meaning potential polluters, since the growing awareness of the need to treat industrial effluents has made much progress in this respect. General Motors, for example, recently inaugurated a very advanced system of treating its effluents.

The Lower Santista basin is closely connected to the Sao Paulo metropolis and includes the municipalities of Cubatao, Guaruja, Mongagua, Praia Grande, Santos and Sao Vicente. The rainfall drainage is very complex, with extensive areas of salt marshes and rivers influenced by the tides, such as the Cubatao and the Casquiero. The total drainage area of the basins is about 1,603 square km. The largest are those of Itapanhau (Santos-Bertioga), with 430 square km; Rio Branco, or Botujuroca (Praia Grande), with 660 square km; Cubatao, with 126 square km, and Guaratuba (Santos-Bertioga), with 123 square km. Most of the rivers of these basins, before their discharge, pass through swampy regions forming entanglements with the inlets of the sea, thus making their waters salty. The Santos supply comes from the waters of three different sources: the Cubatao River, the Pedras River and the Piloes River.

Despite construction of underwater drainage and existence, at least, of SABESP projects, the Lower Santista sewage system is still precarious. Only Santos has a sewage system that serves 85 percent of its population. Sao Vicente and Guaruja have partial systems. Use of septic pits predominates in the region, which pollute the streams of water adjacent to beaches. The Cubatao basin receives the industrial effluents from the Cubatao industrial park--such as those from COSIPA [Sao Paulo Iron and Steel Company], the Presidente Bernardes Refinery, Union Carbide and arbocloro--as well as part of the reversed flow of the Tiete, through the Billings Dam. In the other basins the only problem is the fecal pollution, since they receive little or no domestic sewage, and sometimes exhibit very good conditions.

The Billings basin has now become the great receptacle for sewage from all Sao Paulo. It is rapidly becoming involved in the growth of the Sao Paulo metropolitan area. There are about 110 sources of industrial pollution in the region, of which just 9 are responsible for 88 percent of its total pollution. The major polluting source is the Eletrocloro/Copamo complex, but it is developing a treatment system that has been estimated to cost 20 million cruzeiros. The Rio Cotia basin, with only 238 square km, receives a load of organic pollutants equivalent to a population of 100,000 inhabitants. It comes from the cities of Barueri, Cotia, Carapicuiba and Jandira. Of the pollution load it receives, 55 percent comes from cold-storage plants, 16.5 percent from food industries, 18.5 percent from ration factories, 7.5 percent from paper and cellulose industries and 2.5 percent from other types of industries.

The Guarapiranga River basin (Santo Amaro) collects the waters of the Guarapiranga, Embu-Guacu, Embu-Mirim and Ribeirao Itain rivers and various small streams. Its area is 630 square km. There are 126 potential industrial polluters in the region that, together with the municipal sewage, introduce a load of 5,800 kg of DBO per day, equivalent to a population of 11,000 inhabitants.

The South Coastal basin includes the municipalities of Itanhaem, Iguape, Peruibe and Cananeia. Due to the absence of a great number of industries and even their total absence in many areas and the small flow of tourists, the quality of this basin's water is very good. The Ribeira de Iguape River basin receives the effluents from 12 municipalities, but only Jacupiranga and Registro have waste treatment. Nine of the municipalities have sewage systems. Most use domestic tanks. The 23 industries of the region are small food and extractive industries, especially for nonmetallic minerals. The pollution loan introduced is 1,560 kg DBO per day, equivalent to a population of 2,900 inhabitants. The major polluter is the Barrao cold-storage plan, which introduces about 1,000 kg DBO per day.

In the North Coastal basin, with 2,030 square km, there are 10 industries installed, responsible for a load of 830 kg DBO per day. The most important is the Atino Maciel Leite Food Co, with a pollution load equivalent to a population of 6,000 inhabitants. The rivers of the basin begin mainly in the Serra do Mar, as is the case with the Acaru, the Grande, the Peruba, the Juqueriquere, the Santo Antonio and the Guaxinduba. The municipalities of Ubatuba, Caraguatatuba, Ilha Bela and Sao Sebastiao have a great deficiency of water supply as well as of sewers aid, consequently some stretches of the beaches are polluted. The sewage is discharged into small streams of water or directly onto some beaches.

In summary, we would say that the 1977 situation of industrial water pollution in the state was the following: of the 3,665 industries, 1,058 had systems for treating their effluents installed and in operation. Another 2,330 had systems in planning or under construction and, finally, 277 had systems installed but deficient. Of the 520 municipalities, 52 had sewage treatment systems, 460 did not have them and 8 were in a stage of constructing them. These data exclude 34 Greater Sao Paulo municipalities, 6 in Lower Santista, 15 in Ribeira de Iguape and 4 of the southern coast.

It can be confirmed that much is being done to abate industrial pollution, although much remains to be done. The situation of municipal sewage is still very precarious. In the Sao Paulo region SANEGRAN [expansion unknown] (or any other project) should improve the situation greatly in an area that is now really surrounded by sewage piled high on all sides.

8834
CSO: 5200

EFFECTS OF PORTO ALEGRE RIVER CONTAMINATION DISCUSSED

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 10 Sep 78 p 32

[Text] Porto Alegre--Sewage, domestic and industrial refuse and agricultural protective agents discharged into the rivers forming the Guaiba estuary are contaminating the sources of supply and jeopardizing the potable water supply for the cities which comprise Greater Porto Alegre. And future installation of petrochemical and coal complexes upstream from these sources will increase the water's pollution, making it unfit for human consumption.

This statement was made by Napoleao Rodrigues de Freitas, military and civil engineer who specializes in sanitation and is an employee of the Work Division of the Porto Alegre Municipal Department of Water and Sewers. He foresees great future difficulty in solving the water-supply problem for the 14 cities of Greater Porto Alegre, which will have 3,550,000 inhabitants by the year 2000. If the present trend of increasing sources of pollution of the Guaiba and its tributaries--which he considers already irreversible--continues, Napoleao Rodrigues de Freitas believes that in the future none of them will meet the three basic requirements for a supply source: quantity, quality and permanence.

The municipalities of the metropolitan region are supplied basically by the Guaiba, Sinos and Gravatai rivers. There is no problem regarding the quantity of water supplied, but preservation of its quality "is daily becoming one of the most serious challenges in the region." Based upon reports of the Municipal Department of Water and Sewers, Napoleao Rodrigues de Freitas shows why.

Pesticides

DMAE [Municipal Department of Water and Sewers] report number 14, prepared in 1974, says that the Jacui River, which provides 85 percent of the Guaiba's waters, is contaminated by agricultural protective agents. "Development of the Jacui basin agricultural region, with an area of approximately 84,000 square km, about 30 percent of the Rio Grande do Sul region," the report states, "causes great concern for the DMAE because it serves as a supply

source for the city of Porto Alegre. The findings about organic, inorganic and physical contamination of the river are very good and show that its waters are still very pure, but contamination by organic substances due to phenols and pesticides already causes concern; the former are prevalent from the city of Cachoeira do Sul (169 km from Porto Alegre) and reach a maximum in Sao Jeronimo (68 km from Porto Alegre); the latter, in an initial stage of research, causes concern because of the constantly rising consumption of these protective agents, which are used in the State Agricultural Development Plan."

Further on, the report points out that the large storage dams in the upper reaches of the Jacui, intended to provide electrical energy, will act as cultivating areas for aquatic flora and fauna which, with highly concentrated amounts of agricultural protective agents, will cause serious problems for the city of Porto Alegre water supply and alteration in the ecological cycle. According to the Agriculture Secretariat, 100 different types of insecticides and pesticides, making a total of 15,000 tons of powdered products and 1.4 million liters of liquid products, were used during the 1975 agricultural year. It is believed that these quantities have now doubled.

"The presence of phenol," the report says, "was confirmed throughout its length, and its smallest amount is always 15 to 20 times greater than the upper limit permitted for water intended for public use."

Sinos and Gravatai, 'Almost Dead'

The Sinos and Gravatai rivers, already considered "almost dead" by environmentalists, are in a situation that engineer Napoleao Rodrigues de Freitas considers "critical." In speaking about sanitary conditions of the Gravatai, from which water is taken for five treatment stations that supply the Anchieta district of Porto Alegre and the cities of Canoas, Alvorada, Chachoeirinha and Gravatai, the technician cited report number 5 of the DMAE Center for Basic Sanitation Studies.

"The Gravatai River, poorly endowed by nature in regard to color, dissolved oxygen and odor, is a river that in itself has a poor physical appearance, with much organic matter and only small quantities of plantlike organisms. The discharge of industrial effluents and of domestic refuse from various rain channels and brooks, representing refuse from a population equivalent to 425,000 inhabitants, is causing a change in its waters, without yet causing irreversible alterations. The mineral oil discharged into the river, which gives it a desolate physical appearance that contributes greatly to its being considered a very polluted waterway, is due to Esso Brasileira de Petroleo S/A--a distributor of petroleum products--and its docking port for ships."

Domestic refuse, now discharged raw into its waters, the report continues, "also contributes to the gradual deterioration now taking place. Self-purification of the Gravatai River is limited for various reasons: it does

not have tributaries that cause appreciable dilution, its aeration is impaired by limited surface contact with atmospheric air and absence of turbulance and photosynthesis is lessened by low transmission."

DMAE report number 16 says that the physico-chemical characteristics of the Sinos River vary from good to fair, but it "is of low quality" in regard to greases. These greases, nonbiodegradable, come from sanitation waste, industrial refuse rich in petroleum derivatives and from ship traffic. Its biological characteristics vary from fair to poor, "due to the high number of bacteria and the composition and fauna of the basic sediment." The stretch of the Sinos between the cities of Novo Hamburgo and Canoas "is the part with the poorest quality."

Dangerous Complex

The Cai River, another tributary of the Guaiba, has the best quality water of all, according to Napoleao Rodrigues de Freitas, but he adds that "unfortunately, it will soon have the petrochemical complex on its banks." The engineer explains that "despite innumerable reassuring statements, we remain convinced that the risks of installing a petrochemical industry upstream from the reservoirs of a city with a million inhabitants, such as Porto Alegre, were not carefully evaluated." In his understanding, "in addition to the risks inherent in the chemical substances themselves, there are risks derived from the industrial processes themselves, which are much greater in view of the high temperatures, operating pressures and proximity of other related substances." The engineer also fears a risk difficult to evaluate: human error.

"What cannot be guaranteed (in this case, the quality of the water downstream)," he explained, "must be avoided by a preliminary degree of caution so that other irreversible catastrophes, such as Seveso and Minamata, do not occur in the future. Uncontrolled use of waterways as receptacles for all sorts of sewage, industrial garbage, agricultural protectives coming from the farms, tends to worsen the quality of water resources in the region."

A Solution

After these findings, which he considers "realistic," Napoleao Rodrigues de Freitas suggests a solution for the future water supply, which would be to seek a new source and another place for dumping sewage, through reversing the flow of the Gravatai River and its connection with the sea. The new source would be the "casamento Lagoon," with an area of 380 square km (volume of 1.14 billion cubic meters).

The "Casamento Lagoon" is the northern extremity of the Patos Lagoon, with which it connects through a 7-km-wide channel.

Government Attempts Coverup

The revelation by Napoleao Rodrigues de Freitas about the poor quality of the water that supplies Porto Alegre and surrounding cities is not the first to be made, but authorities on the state, as well as municipal, level always try to minimize the danger faced by the population and even punish technicians who are concerned about the problem. Chemist Milo Raffin, who 2 years ago published a report showing that the waters of the Guaiba are contaminated with potentially carcinogenic substances, was relieved of his duties in the Rio Grande Sanitation Company and had to go to court to assure his rights. Engineer Napoleao Rodrigues de Freitas himself, after writing an article for ENGENHARIA NO RIO GRANDE DO SUL magazine describing the water-supply situation in the metropolitan region, was subject to "unusual" pressures in the Municipal Department of Water and Sewers.

DMAE officials take a contradictory position on the matter. Personally, in interviews, they deny the seriousness of the Guaiba pollution problem, but in their technical reports they express great concern. In the 1977 annual report of activities, for example, they say that "the water of the Guaiba appears to be in a precarious condition."

8834
CSO: 5200

NATIONAL INSTITUTE STUDIES EFFECTS OF INDUSTRIAL POLLUTANTS

Baghdad AL-THAWRAH in Arabic 25 Sep 78 p 6

[Article: "What Have We Done To Stop the Danger?"]

[Excerpts] Water and air pollution, together with soil contamination, are among the leading problems we now face. There is no disputing the fact that water is essential for civilized life and that it is an important ingredient of everyday living. By way of illustration, it is estimated that a modern city needs 565,000 metric tons of water and 8,500 tons of fuel--oil, coal, natural gas and gasoline--to meet the daily needs of every 1 million inhabitants. The same amount of water is subjected to pollution by 450,000 metric tons of sewage, 1,800 metric tons of garbage and 860 metric tons of airborne contaminants.

The sources of air pollution include industrial smoke and exhaust fumes. Automobile emissions are considered a principal source of environmental pollution in large cities. The primary reason is the incomplete burning of fuel in automobile engines. Studies show conclusively that automobile emissions are a principal cause of chronic bronchitis and sinus inflammation. Polluted air contaminates surface water and damages plant life.

To acquaint ourselves with measures taken to safeguard the environment in Iraq, we visited the pollution research center of the National Science Institute, established in 1977. The center is located on the left side of the entrance to the administration building of Baghdad University, in al-Jadiriyyah district. According to its director, Dr Salih al-Matlak, the center's function is to conduct pollution research and tie environmental studies to development projects in a manner that will insure a safe and healthy living environment. A second function of the center is to protect agriculture, nature, parks and archaeological sites from the effects of industrial pollution. The director said the center conducts training sessions, as well as discussion and study groups aimed at combatting pollution. It trains engineers and technicians from all governmental departments in a variety of monitoring techniques. It also serves as a technical consultant and cooperates with all governmental agencies in all matters related to improving the environment, particularly in the area of education and dissemination of information. The director assured us of the party leaders'

interest in maintaining a healthy environment, and added that the national development plan takes note of the environment and establishes guidelines for the center's work. He pointed out that one of the country's laws stipulates that no project or plant may be constructed without first consulting the Supreme Council on the Environment. The purpose of the law, he explained, is to so locate industry as to preclude danger to the health of the citizens. With respect to industries established before the passage of the law, the director infomed us that special equipment was ordered to clean inudstrial emissions.

Dr Salih explained further that industries are required to treat liquid and solid residues before disposal in rivers. Recycling is also encouraged wherever possible. In addition, standards are established for the disposal of residues in rivers and subsurface waters.

He said further that it was necessary to maintain a balance between imported technology and its effects on the environment. Among others he pointed to the necessity of locating automobile repair shops, especially paint shops, away from population centers. He emphasized the danger of spilled engine oil to land and subsurface water, and suggested that automobiles with excessive exhaust emissions be banned from the streets.

Speaking of the center's record, the director pointed to a series of studies in addition to the current research on physical, chemical and biological changes in the Tigris and Euphrates rivers and their tributaries. He also indicated the center's research on the effects of pollution in the Tigris River produced by industries located south of Baghdad. In addition, he described an experimental project for purifying drinking water. He indicated the existence of other proposed studies, including one to survey the amount of boron in Iraqi soil and water and a second one, proposed by the Ministry of Planning, for measuring and identifying the gaseous emissions of the al-Dawrah refinery. Still another study, proposed by the Supreme Agricultural Council, focuses on the feasibility of using marine plant life to purify drinking water.

Dr Salih concluded his interview by indicating that the center is comprised of several specialized units, including water, air, soil, food and wildlife. In addition, the center is equipped with chemical and microbiological laboratories.

Our visit to the center coincided with a training session dealing with the purification of water and attended by a number of specialists for a variety of governmental agencies. We interviewed a few of them. Here are samples of what they said.

Samahah Muhammad Abdallah, a chemist in the Baghdad water department, said that the problem of safeguarding the environment has become an important concern of every advanced country, and that it was Iraq's obligation to keep up with developments in this area in order to update the country's capability in protecting the environment. In particular she empahsized the need to safeguard drinking water.

Mr Faris Ramzi Elias, assistant engineer in the rural water department, underscored the need to concentrate on research on treating drinking water in the rural areas. He stressed the importance of extending treatment techniques to all villages in the country.

Mr 'Abd al-Latif Ja'afar Hamdi, chief engineer in the Sa'ad establishment, saw health education programs as a natural follow-up to the research work. His main concern is to increase citizen awareness of the harmful health aspects of pollution. The educational campaign, according to him, must extend to all agencies of government, industry and the farming communities. Citizens must be made aware of the types, causes, dangers and methods of preventing the spread of pollution. In particular, citizens must learn to follow governmental warning and directives and to cooperate by reporting sources and causes of pollution.

Chemist Sawsan Jamil, who works in the oil industry, says the training session of the center has increased her scientific and practical knowledge in the area of environmental research. In particular, she felt that she was better equipped to apply what she has learned in her work.

Nazik Shawkat, assistant laboratory director, explained to us that this training session was only one of many conducted by the research center for improving the skill of research workers in all governmental and other concerned agencies.

9063
CSO: 5000

AIR POLLUTION IN NIZHNEKAMSK DISCUSSED

Moscow TRUD in Russian 1 Oct 78 p 2

[Article by F. Bagautdinov, chairman of the municipal council of people's deputies: "Clear Sky Over the City]

[Text] Nizhnekamsk is a very young city in Tatariya. Its appearance on the map and its current reputation are linked with the establishment of the country's mightiest petrochemical industry and vigorous tire production on the Nizhnyaya Kama. The foundations for the first apartment house and high school were laid on 23 April 1961 on the territory of the future Nizhnekamsk--a city without the usual borders and embodying the most progressive ideas in city design and construction. The plans for building the city, developed by Moscow specialists, were given the gold medal of the Exhibit of Achievements of the National Economy of the USSR.

In the establishment of a city in the Nizhnekamskiy industrial region more than 40 planning organizations are at work. In this developmental work, in addition to architects, there participated sociologists, economists, psychologists, physicians and ecologists. The end result of their collective labors was the detailed model of a city with prospects of 250,000 inhabitants in which the rationality of a complex construction project is being combined with comfort and the optimal conditions for work and relaxation.

The people of Nizhnekamsk can boast that there is not one smokestack in the city. The residential zone has been separated from the industrial zone by a 5-7 km belt about 2,000 hectares in area, 650 of which serve as a fruit-growing sovkhoz. In the spring when the apple and cherry trees are in bloom the entire space between the city and the combine wallows in white finery.

The industry of Nizhnekamsk continues to develop. Production capacity is on the rise in the production of man-made rubber, ethylene, divinyl and cylinder heads for Zhiguli and KamAZ motor vehicles. The executive committee of the city council, its standing commissions and people's deputies constantly keep track that the development of a large chemistry industry occurs without damage to the environment and does not threaten man's health. When the question was decided on the construction of the next scheduled enterprise for treating

by-products from the petrochemical industry of Tatariya, Bashkiriya and the Western Urals, the city council executive committee carried out a decision on removing it to a distance of 15 km beyond the city's outskirts.

The main arteries have been placed beyond the residential zone, the roads have been separated from the homes and sidewalks by multiple rows of green planted strips. These "living vacuum cleaners" absorb a significant amount of carbon monoxide and serve as an unusual noise shield. Street car routes are being extended and the pool of electric cars is on the rise. The problem of decreasing exhaust fumes is being solved. With this aim in mind diagnostic maintenance centers have been opened at motor transport enterprises. They adjust the vehicles' fuel equipment.

Major attention is being devoted to the green architecture of the city. "The oxygen factory" occupies 200 hectares. Annually the city plants more than 22,000 trees, 130,000 decorative shrubs and about 10 hectares of flower gardens. Today for every Nizhnekamsk inhabitant there are 16 square meters of greenery. There is a thrifty and efficient use of the natural riches of the suburbs. Preventive treatment centers, pioneer camps, recreation bases and rest homes have been situated in the oak groves and woods. In the near future work will be completed on setting up a forested park zone.

Of course, concern for the environment and for clean air requires great efforts and large capital investment. It is no secret that the wide variety of harmful discards of the petrochemical industry is unequaled among the other branches of industry. Much has already been done. Biological sewage treatment plants equipped with the latest equipment, dust and gas trapping and decontamination devices are in operation at the enterprises. At the Nizhnekamsk petrochemical association, Nizhnekamskneftekhim, the amount of discards into the atmosphere has decreased by two times and the pollution of the territory of the industrial area by 10 times. For just these purposes about 80 million rubles were spent in the last five years.

A large volume of work has been outlined to be completed during the 10th Five-Year Plan. Plans call for introducing more than 60 large-scale organizational and technical measures, including the use of new means to cleanse gases from undesirable discards. Every year the enterprises take a "smaller drink" of the Kama's waters. The changeover from closed cyclic water supply systems to a more modern system at the petrochemical combine has brought about a decrease in water consumption by two times in comparison with what was projected and has allowed for a major decrease in the dumping of conditionally clean sewage into water resources.

Nevertheless, we cannot say all environmental protection problems have been solved. While the air over the city of Nizhnekamsk is clean this cannot be said about the industrial zone. Several enterprises continue to discard contaminating gases and effluents. This occurs because the managers of a number of ministries and departments and branch scientific institutes in building up the capacities at the enterprises and opening up new production

forget about the frugal regard for nature. The construction of natural protection projects, as a rule, lags behind the erection of production facilities. Plans calling for the utilization and reprocessing of industrial waste have not been completed. This is due to the fact that in planning estimates the volume of discarded materials is oriented on a completely clean environment without accounting for local conditions and the following takes place: Every plant is separately fitted into an established standard, but taken as a group they exceed the permissible level of environmental pollution.

To oblige a decrease in estimated costs of projects, planners disregard environmental protection requirements. Much chemical production becomes operational with devices to decontaminate aggressive effluents and exhausted gases. For example, two years have gone by since "Etilen-450" began operating but the oven outlined in the plan to burn off residue and heavy hydrocarbons is still under construction.

Black puffs of smoke cover the sky over the sludge accumulator of the tire plant. The planner, the Leningrad rubber planning institute, Rezinoproyekt, did not equip it with chambers for the destruction of non-utilized gases and now vulcanized overflow and defective tire casings go into the fire. But afterall such building materials as rubberized-cord slabs could be made of them. Incidently, agriculture is experiencing an urgent need for them. Tire manufacturers, after the plant had already become operational, had to conclude a contract with one of the scientific research institutes in Kazan' for the development and introduction of a vibrational combustion device. They themselves had to put into production the manufacture of slabs from rubber and cord.

The planning and design bureaus and scientific research institutes are altogether too slow in developing new and efficient systems to decontaminate and utilize industrial by-products, primarily for the smokeless combustion of hydrocarbons. As yet there are no planning decisions on reducing conditionally clean sewage. Tongues of flame fill the sky and smokestacks continue to "decorate" the scenery of the petrochemical industry although it is possible to derive useful products even from plant smoke.

At the Nizhnekamskneftekhim production association construction of a unit to use spent catalytic agents has dragged on for many years. Dozens of thousands of tons of them are annually discarded into dumping grounds at a time when the matallurgical industry needs these agents. Examples of such an uneconomical approach are many. A portion of those that have not found application are the liquid by-products from the petrochemical industry that might successfully be used in the boilers and furnaces at heat and electric power plants. However, power engineers do not want to use this type of fuel and the petrochemicals are burned off into the atmosphere.

So that the large chemical industry--the glory and pride of the republic--does not bring irreparable damage to the kray's ecological balance what is needed are the collective efforts, concern and coordination of work of the

many ministries, departments and scientific institutions; and strict control over use of direct purpose funds allocated by the state for the needs of protecting nature and renewing its resources. Today it is not enough to only build up the capacities of sewage treatment plants--they are very expensive and often go out of order. A radical solution is to generally shut off the admission of harmful discards into the atmosphere and water and to convert the enterprises to progressive waste-free technology. This technology would not only contribute to the output of finished products, to a growth in the productivity of labor and be economically efficient, but it would even be completely in accord with the interests of nature and cause it no harm. Only with such an approach can we successfully safeguard our priceless riches without which it is impossible to preserve the health and life of man.

8504
CSO: 5000

LEGAL PROTECTION OF NATURE IN KAZAKHSTAN ANALYZED IN RECENT BOOK

Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSR in Russian No 8, 1978 pp 77-78

[Review by V. S. Shelestov, doctor of judicial sciences and A. M. Zaporozhets, candidate of judicial sciences, of the book "The Legal Protection of Nature in the Kazakh SSR," editor-in-chief A. Ye. Yerenov, corresponding member of the Kazakh SSR Academy of Sciences, Alma-Ata, Nauka, 1977, 1,500 copies, 298 pages, 2 rubles 70 kopecks]

[Text] The Earth is not only the cradle of mankind, it is also the laboratory of his life. The complexity and interrelationship; of natural phenomena require a proportionate and intelligent use of its separate components by man. Let us say, to obtain maximum utilization of the fertile land it is necessary that such land should occupy not large dense tracts but should alternate with areas occupied by forests, field-protecting plantings, perennial crops, and finally, with virgin parcels used by other branches for agriculture and industrial production. A non-systematic utilization of land might lead to undesirable results, and in specific instances even to destructive consequences on a proportionate scale.

Just such a conclusion can be made after having become acquainted with the work being reviewed. The book especially underscores that only intelligent and optimal use of the natural environment can, on one hand, provide man the opportunity to use its natural wealth for necessary purposes, and on the other hand, provide for either self-regeneration or renewal of natural resources which guarantee the normal process of life on earth.

The work being reviewed is one of the first of some highly successful and complex studies on legal problems concerning the environment in which we live. Various aspects of the given monograph attest to the fact that such a multiplan analysis of natural protection questions is valuable not only for jurists but also for all those who have even the slightest contact with nature.

The structure of the work differs favorably from earlier published studies similar in various regards. One can become persuaded after having become familiar with the monograph.

Chapter I is devoted to an examination of the understanding of the legal protection of nature and to the improvement of natural protection legislation. The author introduces a wide variety of proposals on further legislative consolidation of man relations with nature. Among them, in particular, is the problem of more intelligent use of the cosmos on an international scale, the development of an international accord on the limitation or regulation of launches of spacecraft (pp19-20). By analyzing legislation and noting the course of its further improvement, the author arrives at a completely substantiated conclusion that under present circumstances the need has ripened to adopt an all-union law on the protection of nature (p 23).

Chapter II examines a circle of problems related to the right of state ownership of land. First and foremost here is underlined the lack of a clear-cut standard consolidation of the statute for the USSR as the sole and unique entity subject to the right of state ownership of natural resources (pp 56-56). It is true that a uniform solution is complicated by the fact that legal literature in this field is marked with diverse approaches. Scientific legal scholars in studying the various aspects of the right of state ownership, including the various components of nature, proceed from the fact that a national state is the sole and unique entity subject to the right of state ownership. In opposition to this there are certain scientific agrarians who promote the idea that it is not only the USSR but also the union republics that are entities subject to the right of state ownership of natural objects. Therefore, under present conditions when existing legislation is carried out in accordance with the USSR constitution and the constitutions of the union republics, it would be advisable to more clearly specify a statute stating that natural resources are the exclusive state property of the USSR. This might contribute to the elimination of unnecessary arguments and also might confirm the continuity of our laws.

In analyzing the functions of a national state, the author in chapter II tells of judgements on the advent of the new function of protecting nature which is taking on a constitutional character (pp 62-65).

Chapter III is devoted to an account of the structure of organs that put the protection of nature into practice. This section of the work is done at a high level. At the same time in considering the given chapter one has to make one observation. The author divides the natural protection organs into two groups--in a narrow and a broad sense (p 86). In principle such a classification is correct, but it appears it would be more expedient to speak about a cumulative system of division--organs of overall and special jurisdiction. Otherwise it loses its scientific interest.

A thought running through the entire work is the idea of all possible means in the protection of land. Special attention is given to this problem in chapter IV. The author quite convincingly substantiates his conclusion about the need to adopt urgent and decisive measures to conserve and increase the amount of agriculturally significant land and to not tolerate its decrease. Keeping to a minimum these instances where land is taken under con-

ditions of developing socialism is a task that has great political and state importance.

Deserving of full support is the proposal by the author in chapter V for further regulating water legislation. He recommends the development of statutes on all organs of the water conservation service, on water basins and on demands made for water conservation activities (p 148).

The application of law requires this. However, expanding the sphere of legal regulation in this area being studied still does not bear witness to a budding development of specific institutes of legislation in the independent branches of law. Meanwhile the author speaks about this as if it was a fully resolved problem (p 127, p 131).

Chapter VI examines questions on the legal protection of forests. It is broad and thorough in setting forth problems under analysis. It manifests itself positively in that it researches the standard material of all union republics and draws in the acts of foreign socialist countries. By a series of statutes the author puts clarity and accuracy into the regulation of forest relations.

On the whole, in giving a positive evaluation to chapter VII on the legal regulation of minerals, it is possible to fully agree with the conclusion on the alleged contradictions concerning the underground water system as contained in the "Principles of USSR and Union Republic Legislation on Minerals" and in the "Principles of Water Legislation of the USSR and the Union Republics" (p 208). We think that the author unnecessarily complicates the problem. Underground water is a component part of the earth's interior in a physical sense. However, if we proceed from the significance of water in the life of man and the complex legal regulation accumulated in this field of relationships, including underground water as well, the latter comprises the sphere of activity of water legislation.

The last two chapters (VIII, IX) are devoted to presenting an account of the legal system for the protection of the fish supply and that of wild land animals. On the whole the author's recommendations have been studied by the legislative organs. It is known that in accordance with the decree of the Presidium of the USSR Supreme Soviet of 12 December 1977 "On the Organization of Work for Bringing Forth USSR Legislation in Accordance with the USSR Constitution"* the development of a law to protect the animal world is specified.

At the same time we cannot agree with the various positions of the authors of the given chapters. In particular, the work indicates that existing legislation knows of the division of fish industry water resources into four groups (p 257). Meanwhile such a classification has not been adopted universally since it is being implemented in only Moldavian SSR and in the Kirgiz SSR. In addition, this classification is debatable. Any water resource is a place inhabited by water animals, primarily fish. Uninhabitable water

resources can be either swamps or polluted sources useless in sustaining fish life. For the latter we must take measures to renew them.

There is great detail devoted to questions for the protection of wild animals. Here the recommendations related to the further improvement of legislation for the animal world are well-founded. In addition we consider it advisable to codify the legislation on wild animals by means of publishing a unions law, but not the "Principles of Legislation for the USSR and the Union Republics," and corresponding codes for the union republics as the author proposes.

The remarks that have been made to a large extent are controversial in nature and do not lower the evaluation of the reviewed monograph. There is every reason to believe that the collective of authors is on the proper path to solving the many-sided problems in the legal protection of the environment.

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* Reports of the USSR Supreme Soviet, 1977, No 51, p 764

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BRIEFS

AUTOMOTIVE CLEAR AIR COMPUTER--Electronics are expanding opportunities in environmental protection. The Zhiguli has an unusual "computer"--an electronic combustion system--created by the engineers of the Moscow Motor Vehicle and Tractor Electronic Equipment Plant together with the specialists of the VAZ [expansion unknown] automotive plant. This system keeps toxic motor vehicle exhaust fumes to a minimum. A special unit has been set up at an enterprise in the capital to output these devices. [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 6 Oct 78 p 1] 8504

COMPOUND COMBATS OIL SPILLS--The Institute of Oceanology imeni P. P. Shirshov of the USSR Academy of Sciences has invented an effective compound to remove oil and petroleum products from the surface of the water. The experiment was conducted in Vladivostok. An artificially created film of black oil on an enclosed portion of the sea was treated with a solution of the preparation. A wide clear strip of water beyond the spraying device set up on a self-propelled barge. The black oil film was not broken down there but formed into a milky white emulsion dispersed to the surface layer of the water. At the same time the gas exchange between the atmosphere and ocean quickly restores itself and the emulsion is completely decomposed by the water's microorganisms. This new non-toxic compound which has a practically limitless storage period has been recommended for industrial production. [Text] [Moscow TRUD in Russian 1 Oct 78 p 4] 8504

PLAN SEWAGE TREATMENT WORKS FOR SARONIKOS GULF

Athens TA NEA in Greek 22 Sep 78 p 1

[Text] Within a year and a half at the most, the construction activities will be completed on waste treatment works for industrial wastes in Elevsis, the prototypes of which have already been built for serving the Aspropyrgos refinery, the Skaramangas shipyards, and other outfits.

One of these works will be built for each large plant--such as, for example, for the Khalyvourgiki outfit--or else they will be built on the basis of groups of smaller plants, according to the explanations given yesterday by Minister of Industry and Energy Milt. Evert.

The amount of investment for the construction of these works will fluctuate between 20-25 million drachmas:

And depending on its size, there will be costs incurred by the industries which will be served by these projects.

It is explained in this connection that the industries concerned will be helped with the implementation of this program through the incentives for industrial investments arising by virtue of the relevant bill--whose passage by the Chamber of Deputies is already being taken for granted by the government.

For Sewage Treatment

In addition, within 3 years--still according to the statements made by the minister of industry and energy--there will be a program for:

The construction of a large sewage treatment works, into which will flow at first the discharged industrial wastes for final purification, and later also the sewage from the capital's sewage system.

The site of establishment of this central sewage treatment works has not yet been decided on, although it now seems that Psyttaleia is already preferred as the most desirable site, in which case the sewage to be purified will flow there through pipes.

The entire system of the definitive treatment of the sewage and wastes of the capital is being studied by the two ministries, the Ministry of Public Works and the Ministry of Industry.

The total expenditure for this project, which will be borne by the State, has been calculated to lie at the level of 100 million drachmas, at today's prices.

Regardless of whether the individual waste treatment works will be built by the industrial plants which are presently doing the polluting, the fact is that there will be assistance in meeting the relevant costs through the state subsidies which are provided for by the system of incentives.

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BRIEFS

MARBLE CRUSHING POLLUTION RISK--Another muddle over contradictory governmental policy has just been brought to light by the marble crushing and grinding industries near Athens. Several factories are operating in the area of the Mt. Pentelikon marble quarries on the southern and southwestern slopes of the mountain. After fair warning, the marble quarries themselves had closed down, one by one and most of them moved to other locations, far from built-up areas. The marble-crushing factories stayed on because they do not quarry marble but use up the heaps of broken marble fragments and chippings left when the whole blocks were taken out of the mountainside. They pulverise this waste material and the powder produced from it is used for the manufacture of tiles, for plastering, for glassmills, for certain pharmaceutical processes, etc. At the same time, the ugly slag heaps left by the marble quarrying are gradually being absorbed. Two more such factories were licensed to open up in the same area in February and in April of this year and have been in operation since then. The Ministry of Industry has now informed both that it is withdrawing their operating licenses. This has caused all the factories in the area to close down in protest and, as they are the only ones in the whole of Greece to produce white (Pentelikon) marble powder and granules, the building trade and industries dependent on their output are running out of raw material. The excuse given for recalling the operating licenses was that the flying dust was noxious to the environment. Against this argument, the concerns involved point out that, they are slowly clearing up an eyesore created by the slagheaps and as for the flying dust, improved arrangements to trap it can be installed to spare the few scattered inhabitants of the area such annoyance as they may be suffering. The factories concerned and their colleagues also point out that these matters should have been thought of when the operating licenses were issued in the first place, and not six or more months later. The other factories joined in, because they feared that what they described as irresponsible action at the ministry could spread to their operations also. [Text] [Athens HELLENEWS-EXPRESS in English 5 Oct 78 p 9]

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BRIEFS

AIR POLLUTION SEMINAR -- Yesterday, a seminar on "Air Pollution Modelling" began at the Bosphorus University in Istanbul. In discussions held in the seminar it was said that "the environment in Istanbul has reached dangerous dimensions of filthiness." In the Seminar, which was arranged by the Environmental Questions Group of the Bosphorus University Institute for Technological and Systems Research, faculty member Kriton Curi made the opening speech. He noted that "air pollution in Istanbul has begun to collectively bother the residents." In Paris, the average pollution is 220 on the Air Quality Index, in Munich, it is 158, and in Istanbul it is 400. For this reason, the necessary steps should be taken immediately to stop the pollution. Along with the Turkish scientists, Dr. Gilbert Cocquyt, who is in charge of the Belgian Nuclear Energy Research Center, is participating in the five day seminar. [Text] [Istanbul MILLIYET in Turkish 26 Sep 78 p 11]

CSO: 5000

PROBLEMS, PROGRESS IN CLEANING UP RHINE DISCUSSED

Duesseldorf **WIRTSCHAFTSWOCHE** in German 22 Sep 78 pp 35-36

[Text] Salmon are again swimming in the Rhine. It seems that the river has become cleaner. But the first impression is deceiving.

In mid-August--sour pickle time--the newspapers headlined: "Salmon Found in the Rhine." A few days later: "Second Salmon Netted!"

In a short time it seemed as though the filthy German river had again become a clean body of water, for things were happening which had not happened for 30 years. Fishermen were reporting sensational catches.

Nevertheless: "I wouldn't have liked to eat the salmon," said Professor Joachim Borneff, director of the Hygiene Institute at Mainz University, about the catch. Phenols, abundant in the water of the Rhine, affect both the taste and the smell of the fish.

Borneff, moreover, doubts that the Rhine can really be made "palatable again as a route" for salmon, as Otto Meyer (CDU), Rhineland Palatinate Minister of Agriculture and Environmental Protection, euphorically predicted. In the view of the minister, the salmon catch shows that the reclamation of the river is bearing its "first fruits."

Professor Borneff also sees such fruit ripening. On behalf of the Laender Work Group for the Purification of the Rhine, he examined the water of the river under the microscope and studied it in centrifuges. Borneff's analysis: "The Rhine has a smaller load of pollutants than 10 years ago."

In the case of the polycyclical aromatic hydrocarbons, which are contained in waste gases and combustion residues, and which are rated as carcinogenic, a reduction to about half the 1970 value was reported. There are also successes in combatting other pollutants. The mercury content declined by 80 percent, the cadmium content by 50 percent. Says Borneff: "Only once

during the year did we find a cadmium concentration exceeding the amount permissible for drinking water. Everything else was even better than drinking water." But the cloudy brew is still far from being clear. Says Oto Malek of the Office of Water Protection and Sewage Technology in the Federal Interior Ministry: "We also have concentrations of pollutants which are still slowly rising." For example, the 1.5-milligram per liter concentration of phosphate last year was "far above the limit set in European Community guidelines." The consequences for the river: increased growth of algae.

The load of salt from the potash pits in French Alsace is also causing concern for the Rhine-purifiers. Now it is finally to be stemmed--even with the money of German taxpayers.

France has in this connection obligated itself in the so-called Chloride Agreement gradually to reduce the introduction of waste salts into the Rhine by 60 kilograms per second. Bonn is participating with a lump-sum payment of 30 percent (DM20 million) of the cost of the depositing the salts in deep earth strata envisaged for the relief of the river.

Otto Wittmann, Bundestag deputy and member of the SPD Work Group for Environmental Questions, defends the German payments for the French project thus: "Such a participation in the cost is appropriate because, while the salt load of the Rhine is first determined by Alsatian salt, considerable and as a whole equally large amounts of salt are added later from the Federal Republic."

The Federal Government and the provinces have declared war against these and other undesired additions. A list of "Rhine Polluters" distributed by the Federal Ministry of the Interior contains the names of 153 large "introducers" (German officialese) along the river, and 242 "introducers" on Rhine tributaries. Among the foot-draggers in the purification fight is the Bayer Corporation in Leverkusen--where technical problems are delaying the startup of the treatment plant--and the cities of Speyer, Trier and Krefeld.

Cleanliness is now to be taught particularly to the dilatory communities ("Industry has done quite well in fulfilling its tasks according to plan," says Malek). Under the title "Program for Investment in the Future," the Federal Government, Laender and cities are contributing "about DM3 billion" (Malek) in a second great effort to make the river heathful.

Between 1971 and 1976, the Federal Government alone appropriated DM150 million to make the Rhine cleaner with the "Rhine-Bodensee Program." These efforts scored successes. "The Bodensee decontamination has largely succeeded (Barbara Schuster of the Environmental Affairs Section in the Bonn Ministry of the Interior). The Federal Government, the Laender and cities paid a grand total of DM9.4 billion between 1970 and 1976 for municipal sewage installations. In the same period industry reached deeply into its cash boxes. It paid DM1.7 billion for the purification of its waste water.

The final goal of all these efforts: "90 percent of all inhabitants" are to be "linked to a sewage system and complete biological purification of sewage" (Barbara Schuster). This will be made possible through newly constructed treatment plants or through the expansion of existing purification installations. North Rhine-Westphalia alone will have set up by year's end 135 treatment plants with an investment of about DM571 million. Its southern neighbor, the Rhineland-Palatinate, is putting DM3.7 billion into a 15-year program, in order by 1986 to bring close to 95 percent of all sewage to the rivers mechanically and biologically purified. At the present time only 60 percent of the contaminants are being held back.

How much the efforts for clean water is costing industry is evident from the example of BASF [Baden Aniline and Soda Factory]. The chemical plant annually spends more for environmental protection and sewage treatment--about DM300 million, of which 175 million is for water purification--than for dividends (DM230 million in 1977). The most expensive item in environmental protection is the environmentally proper burning of the sludge. But despite all efforts, sewage "with a certain fish toxicity" still succeeds in reaching the river, freely admits Hans-Georg Peine, head of the BASF Environmental Section. He hopes, nevertheless, that the ammoniac content can be further reduced by 1981 through a conversion of the manufacturing process. The cost envisaged for this: DM10 million.

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END